PROJECT MANUAL AND SPECIFICATIONS
FOR
SACRAMENTO CITY UNIFIED SCHOOL DISTRICT
PROJECT NAME

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(To be provided and edited by the Construction Manager and District)

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ADDITIONAL REQUIREMENTS FOR DSA-REVIEWED PROJECTS

PART 1 - GENERAL

1.01 GENERAL

A. The following additional requirements apply to this Project, which is being reviewed by the Division of the State Architect (DSA).

1.02 ADDITIONAL REQUIREMENTS

A. The Contractor shall maintain full compliance with the requirements specified in Parts 1 thru 5 and Part 9, Title 24, California Code of Regulations (CCR). Unless otherwise indicated or specified, work shall be performed in full conformance with the latest edition of applicable regulatory requirements. All work shall be performed in accordance with the rules and regulations, Title 24, Parts 1-5 and Part 9, California Code of Regulations, and Division of the State Architect, and a copy shall be kept on the job at all times during construction. The codes adopted by the City, County, State and Federal agencies shall govern minimum requirements for this Project. The Contractor shall notify the District of any conflicts between the requirements of the Contract Documents and the requirements of this paragraph.

B. In addition to the duties specified in the Contract Documents, the duties of the Contractor shall be in accordance with the requirements specified in Section 4-343 of Part 1, Title 24, California Code of Regulations.

C. In addition to the duties specified in the Contract Documents, the duties of the Architect and the Architect's consultants shall be in accordance with the requirements specified in Section 4-341 of Part 1, Title 24, CCR.

D. Neither DSA, nor the decisions and instructions rendered by DSA, are subject to arbitration proceedings.

E. Architect shall notify DSA at start of construction in accordance with 4-341 of Part 1, Title 24, CCR.

F. All Addenda and applicable Contract Change Documents (CCD) shall be signed by the District and the Architect/Engineer and submitted for DSA approval. Do not begin work under a written order until a CCD that requires DSA approval has been submitted to and approved by DSA in accordance with Section 4-338 of Part 1, Title 24, CCR.

G. If a Field Change Directive (FCD) or any other field directed change to the Contract Documents which affects ACS, FLS, or SS, it shall be submitted to DSA for review as a CCD. Also, If DSA approval is required for a CCD, it will be so noted on the CCD. In such cases, do not begin work

under a written order until the FCD or CCD has been submitted to and approved by DSA in accordance with Section 4-338 of Part 1, Title 24, CCR. Substitutions affecting DSA regulated items are changes to the Contract Documents and shall be considered CCDs. DSA review of CCDs is required, and they shall be approved by DSA prior to fabrication and installation. FCDs and CCDs shall be signed by AOR, SEOR (if applicable), and DSA in accordance with 4-338(c), Part 1, DSA IR A-6.

H. Contractor shall submit verified reports in accordance with Sections 4-343(c) of Part 1, Title 24, CCR. Architect shall submit verified reports in accordance with Sections 4-341(f) of Part 1, Title 24, CCR.

I. DSA may supervise construction, reconstruction, or repair in accordance with Section 4-334 of Part 1, Title 24, CCR.

J. Construction shall be observed by a full-time Project Inspector employed by the District, approved by the Architect, Structural Engineer and DSA in accordance with Sections 4-333(b) and 4-342 of Part 1, Title 24, CCR.

K. Testing requirements of the District's Testing Laboratory shall be in accordance with Section 4-335 of Part 1, Title 24, CCR.

L. Special inspection of masonry construction, glued laminated lumber, wood framing using timber connections, ready-mixed concrete, high strength steel bolt installation, welding, and mechanical and electrical work shall be as required by Section 4-333(c) of Part 1, Title 24, CCR. The costs of special inspection will be paid for by the District. Nothing in this paragraph shall limit the District’s rights under Division 1 - General Conditions.

M. The intent of these Drawings and Specifications is that the work of the alteration, rehabilitation or reconstruction is to be in accordance with Title 24, California Code of Regulations. Should any existing conditions such as deterioration or non-complying construction be discovered which is not covered by the Contract Documents wherein the finished work will not comply with Title 24, California Code of Regulations, a change order, or separate set of plans and specifications, detailing and specifying the required work shall be submitted to and approved by DSA before proceeding with the work.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

Please delete this page prior to issuance.

- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-11-11 Updated from CBC 2022 to CBC 2025 as applicable

DISTRICT DESIGN STANDARDS

Notice to All Users and Designers!

In many cases, the District does not govern the technical 3-part specifications for the Design Team. The design standards information shown below is provided to convey the District's intentions on manufacturers, products and procedures that the District does or does not want to be used on their projects. The items listed below are to assist you with understanding what needs to be reflected in your 3-part specification without forcing a pre-written specification upon you. Where a 3-part specification section is provided by the District, the items below are design parameters to be considered when applying this specification section to your design. The design team shall confirm and coordinate all product and system requirements with the District during design regardless of them being design standards or full 3-part specifications.

When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

Please delete this page prior to issuance.

All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- This Erosion Control spec section is required if contractor is to prepare and permit the SWPPP.
- Confirm whether a full SWPPP or Erosivity Wavier can be permitted.
- Confirm with District if contractor is to provide Qualified SWPPP Practitioner (QSP) for monitoring and reporting during construction of these services will be completed by District Consultant.
- Confirm access routes and contractor laydown areas with District.

SECTION 01 57 13

EROSION CONTROL

PART 1 - GENERAL

1.01 SUMMARY

A. General: Provide all materials, equipment and labor necessary to furnish and install straw wattles at locations shown on the Drawings and on Contractors Storm Water Pollution Prevention Plan.

B. Storm Water Pollution Prevention Plan: Contractor will be required to prepare a Storm Water Pollution Prevention Plan (SWPPP), and submit to the State Water Resource Control Board to obtain Notice of Intent approval and a WDID number. Comply with State Water Resources Control Board requirements. The SWPPP shall be provided by the Contractor prior to the start of work. The SWPPP shall be tailored to the contractor's approach to the work in this contract. The SWPPP shall be prepared by a Qualified SWPPP Developer (QSD). The Contractor shall as a minimum address:

1. Cut and fill operations.
2. Temporary stockpiles.
3. Vehicle and equipment storage, maintenance and fueling operations.
4. Concrete, plaster, mortar and paint disposal.
5. Dust control.
6. Tracking of dirt, mud on off-site streets.
7. Erosion Controls
8. Sediment Controls

1.02 QUALITY ASSURANCE

. General: Comply with governing codes and regulations.

1.03 SUBMITTALS

A. SWPPP: Contractors Qualified SWPPP Developer (QSD) shall submit to the State Water Resources Control Board via Storm water Multi Application and Report Tracking System (SMARTS) and obtain a Notice of Intent and WDID number prior to beginning work on site.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Straw Wattles: Shall be new manufactured straw roles in compliance with state requirements for sediment control.

A. Filter Bag: Shall be as required by local jurisdiction.

PART 3 - EXECUTION

3.01 INSTALLATION

A. All BMPS shall be installed per the drawings, CASQA standards and as required by the SWPPP.

3.02 MAINTENANCE AND REMOVAL:

A. General: Maintain and repair existing and new erosion control facilities throughout the construction period. Remove silt build up at straw wattles and/or silt fences as needed. Repair damage to earth slopes and banks. Erosion control measures shall be left in place until hydroseed is placed.

B. Monitoring: Based on determined Risk Level of Contractor's SWPPP provide monitoring of erosion and sediment control measures before, during and after storm events. Site monitoring shall be performed by a Qualified SWPPP Practitioner. Update SWPPP continuously throughout construction period and provide reporting and testing as required by the current NPDES permit. Testing and reporting of turbidity and ph will be required for a project determined to be Risk Level 2. Contractor's QSD/QSP will be required to prepare AdHoc reports of all testing on the State Water Resources Control Board's SMARTS database

C. Cleaning: Keep area clean of debris.

D. Remove all sediment control measures following site stabilization.

E. The Contractor's QSD and QSP will be responsible for preparing and gaining approval of the annual report(s) and Notice of Termination on the State Water Resources Control Board's SMARTS database following project completion.

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

Please delete this page prior to issuance.

- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-01-31 – Added language about the District wanting to salvage play equipment.
- 2025-11-11 – Updated from CBC 2022 to CBC 2025 as applicable

DISTRICT DESIGN STANDARDS

Notice to All Users and Designers!

In many cases, the District does not govern the technical 3-part specifications for the Design Team. The design standards information shown below is provided to convey the District's intentions on manufacturers, products and procedures that the District does or does not want to be used on their projects. The items listed below are to assist you with understanding what needs to be reflected in your 3-part specification without forcing a pre-written specification upon you. Where a 3-part specification section is provided by the District, the items below are design parameters to be considered when applying this specification section to your design. The design team shall confirm and coordinate all product and system requirements with the District during design regardless of them being design standards or full 3-part specifications.

When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

Please delete this page prior to issuance.

All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- None at this time.

SECTION 02 41 00

SITE DEMOLITION

PART 1 – GENERAL

1.01 SUMMARY

A. RELATED SECTIONS

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 01 50 00 - Construction Facilities and Temporary Controls.
3. Section 01 50 13 - Construction Waste Management and Disposal.
4. Section 31 00 00 - Earthwork.
5. Section 31 13 16 - Tree Protection.

1.02 REGULATORY REQUIREMENTS

A. Conform to applicable jurisdictional authority regulations and codes for disposal of debris.

B. Coordinate clearing Work with utility companies

C. Maintain emergency access ways at all times.

D. Contractor shall comply with all applicable laws and ordinances regarding hazardous materials, including contaminated soils, hazardous material transformers, and similar materials or components.

1.03 SUBMITTALS:

A. Schedule: Submit a detailed sequence of demolition and removal work, including dates for shutoff, capping, and continuance of utility services.

B. Procedures: Submit written procedures documenting the proposed methods to be used to control dust and noise.

1.04 EXISTING CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

B. Conduct demolition to minimize interference with adjacent structures or items to remain. Maintain protected egress and access at all times.

1.05 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Safety Precautions Prevent damage to existing elements identified to remain or to be salvaged, and prevent injury to the public and workmen engaged on site. Demolish roofs, walls and other building elements in such manner that demolished materials fall within foundation lines of building. Do not allow demolition debris to accumulate on site. Pull down hazardous work at end of each day; do not leave standing or hanging overnight, or over weekends.

1. Protect existing items which are not indicated to be altered. Protect utilities designated to remain from damage.
2. Protect trees, plant growth, and features designated to remain as final landscaping as shown on drawings.
3. Protect benchmarks from damage or displacement.

D. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

E. Fire Safety: The contractor shall conform to chapter 33 of the California Fire Code (CFC), "Fire Safety During Construction and Demolition", at all times during the construction process. A copy of this chapter can be provided.

F. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

G. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

H. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

I. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

PART 2 - PRODUCTS

Not Used

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine conditions of work in place before beginning work, report defects.

B. Report existence of hazardous materials or unsafe structural conditions.

3.02 PREPARATION

A. Scheduling:

1. General: Coordinate and schedule demolition work as required by the Owner and as necessary to facilitate construction progress.

B. Hazardous Materials:

1. General: Identify chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations, and notify such jurisdictional agencies as may be required. Collect and legally dispose of such materials at official disposal locations away from the site.
2. Asbestos: If asbestos or materials containing asbestos are encountered, stop work immediately and contact the Owner. Do not proceed with demolition until directed by Owner.

C. Utility and Service Termination

1. Locate and identify existing utility, service and irrigation system components affected by work of this contract. Review existing record drawings, conduct site investigations, contact Underground Service Alert and other qualified cable/pipe/line locator services, and implement all other means necessary to define the location of underground systems.
2. Prior to beginning any demolition, properly disconnect all water, gas and electrical power supply at appropriate disconnect locations. Obtain all necessary releases and approvals from serving utility companies.
3. Prior to demolition or disconnect, obtain Owner's approval that such system does not impact facilities or systems beyond the extent of this contract.
4. Mark location of disconnected systems. Identify and indicate stub-out locations on Project Record Documents.

D. Verify that existing plant life and features designated to remain are tagged or identified.

1. The Architect will mark the features, trees, and shrubs to remain within the construction area. Contractor shall not commence clearing and grubbing operations until authorized by the Owner and all protective measures are in place.

E. Coordinate the time and duration of all system disconnects with Owner.

3.03 DEMOLITION

A. General Requirements

1. Clear areas required for access to site and execution of Work, including pavements, structures, foundations, vegetation, trash and debris.
2. Coordinate with Owner the time of day and route to remove demolished materials from premises.
3. Remove demolished materials from site as work progresses. Upon completion of work, leave areas of work in clean condition.
4. Remove all buried debris, rubble, trash, or other material not deemed suitable by the Geotechnical Engineer.
5. Fill all voids or excavations resulting from clearing, demolition, or removal of vegetation with specified fill material.
6. See list below for other site specific buildings, structures, equipment that need to be walked with District prior to demolition for items to be salvaged:
   a. TBD.

B. Fixture and Equipment Removal:

1. Remove existing fixtures and equipment as identified and shown on drawings and required by Architect.
2. Verify all service connections to fixtures and equipment designated for removal have been properly disconnected.
3. Remove all conductors from conduit at all abandoned circuits.

C. Play Equipment Removal:

1. Remove existing play equipment as identified and shown on drawings and required by Architect.
2. Coordinate salvage rights with District for individual components, fasteners, slides, etc. prior to demolition and removal from site.

3.04 UTILITY AND BUILDING SERVICES REMOVAL AND RE-INSTALLATION

A. Where crossing paths and potential points of interference with existing utility services are shown or can be reasonably inferred from surface conditions or evidence of subsurface systems, such as meter boxes, vaults, relief vents, cleanouts and similar components.

1. Review all contract documents showing crossing paths and potential points of interference.
2. Pothole or determine by other means the accurate depth and location of such utilities.

3. Incorporate all costs required to complete work under this contract, including additional trenching, re-routing of existing and new utilities, and all means necessary to construct work under this contract.
4. No additional cost to the Owner will be allowed for work necessary to accommodate utility conflicts where such crossing paths are shown on contract drawings or can be reasonably inferred from surface conditions or components.

B. Remove all conductors from conduit at all abandoned electrical circuits.

C. Seal off ends of all piping, drains and other components as directed by Architect and serving utility.

D. Where necessary to maintain service to existing utility and building systems, relocate or redirect all conduit and conductors, piping, drains, and associated system components.

1. Re-circuit all electrical as required.
2. Re-circuit all landscape irrigation valving and control systems as required.
3. Temporarily terminate landscape system components in approved boxes or with approved caps, suitable for re-connection or extension.
4. Extend or otherwise modify all site drainage systems, including catch basins, drain inlets and piping. Fine grade to maintain proper drainage flow pattern to drains.

E. Demolish structure in an orderly and careful manner.

1. Use of explosives prohibited.

3.05 SITE PAVEMENT REMOVAL

A. Remove sidewalk and curb where required for new construction as specified and as indicated on the Drawings.

1. Remove all paving by saw-cutting.
2. Remove concrete paving and curbing at locations shown on drawings. Locate closest adjacent expansion or weakened plane joint to define start of removal or saw-cutting.

B. Remove asphalt concrete paving areas where required for new construction as specified and as indicated on the Drawings.

1. Remove all paving by saw-cutting.
2. Remove paving assembly as required to expose subgrade.

3.06 LANDSCAPE AND IRRIGATION SYSTEMS DEMOLITION AND RENOVATION

A. Clearing, grubbing, and planting demolition.

1. Remove grass and grass roots to a minimum depth of two inches below existing grade.
2. Remove all shrubs, plants and other vegetation within the area of the work unless designated to remain. Grub and remove all roots of all vegetation to a depth of 24 inches below existing grade.

3. Remove only those trees which are specifically designated for removal, or as shown on the drawings, within the construction area. Remove all stumps. Remove root ball and root systems larger than 1 inch in diameter to a depth of two feet below existing or finished grades, whichever is lower and a minimum of five feet beyond the edge of paving, structure, wall or walkway.
4. Hand cut existing tree roots over 1 inch in diameter as necessary for trenching or other new construction, apply multiple coats of emulsified asphalt sealant especially made for horticultural use on cut or damaged plant tissues to cut faces and adjacent surfaces. Cover exposed roots with wet burlap to prevent roots from dying out until backfilling is complete.
5. Disking and mixing of vegetation, trash, debris, and other deleterious materials with surface soils prior to grading is not permitted.
6. Remove all buried debris, organic material, rubble, trash, or other material not deemed suitable by the Geotechnical Engineer.
7. Fill all voids or excavations resulting from clearing, demolition, or removal of vegetation with fill material in compliance with Section 31 00 00.
8. Selected equipment of such sizes and capacities that the existing environment is disturbed as little as possible, and to afford ease of mobility within limited and relatively confined work areas. Make every effort to preserve the topography in its natural state.
9. Keep drains, catch basins, surface drainage courses and related drainage system components clear of debris and construction materials.
10. Remove irrigation piping and appurtenances as necessary within area of work, unless noted otherwise to remain. Replace irrigation piping and appurtenances to irrigate new and/or existing landscaping. Contractor shall be responsible for temporary landscape irrigation until such time that irrigation system is restored and operational.

3.07 DISPOSAL

Demolished materials become property of the Contractor and shall be removed from premises, except those items specifically listed to be retained by Owner.

A. Dispose of all demolished material, trash, debris, and other materials not used in the work in accordance with the regulations of jurisdictional authority.

B. It is recommended [EDIT OPTION required] that all materials that are of a recyclable nature, be transported to a suitable legal recycling facility instead of a dump or refuse facility (unless they are one-in-the same).

C. Burning and Burying of Materials: NOT ALLOWED.

D. Haul Routes:

1. Obtain permits as required by jurisdictional agencies. Establish haul routes in advance, post flagmen for the safety of the public and workmen.
2. Keep streets free of mud, rubbish, etc.; assume responsibility for damage resulting from hauling operations; hold Owner free of liability in connection therewith.

E. Remove demolished materials and debris from site on a daily basis.

3.08 CLEANING

A. Upon completion of work of this Section promptly remove from the working area all scraps, debris.

B. Clean excess material from surface of all remaining paved surfaces and utility structures.

C. Power wash all concrete surfaces to remove stains, dried mud, tire marks, and rust spots.

END OF SECTION

SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Formwork for cast-in-place concrete, with shoring, bracing, and anchorage.
2. Openings for other affected work.
3. Form accessories.
4. Stripping forms.

B. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 03 20 00 – Concrete Reinforcing.
3. Section 03 30 00 – Cast-In-Place Concrete.
4. Section 32 16 00 – Site Concrete.

1.02 REFERENCES

A. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, Chapter 19A.

B. ACI 301 - Specifications for Concrete Construction.

C. PS-1-95 - Construction and Industrial Plywood.

1.03 SYSTEM DESCRIPTION

A. Design, engineer, and construct formwork, shoring, and bracing to meet design and code requirements, so that resultant concrete conforms to required shapes, lines, and dimensions.

1.04 QUALITY ASSURANCE

A. Construct and erect concrete formwork in accordance with ACI 301.

B. Regulatory Requirements:

1. Conform to CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.

1.05 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Plywood: PS-1-95, BB Plyform grade, Class I, Exterior classification. Supply in large sheets of adequate thickness to support the imposed loads, but in no case less than 5/8" thick.

B. Lumber: Douglas Fir species; construction grade; with grade stamp clearly visible. Forms may be used for concrete surfaces that are unexposed and require no further surface applied materials. Lumber, if used, shall be clean and sound 2x (height as required) No. 2 grade or better.

C. Form Coating: Form shall be coated with nongrain-raising and non-staining types of form coating that will not leave a residual matter on the face of the concrete or adversely affect proper bonding of any subsequent paint or other surface applications. Form coating containing mineral oils or other non-drying materials will not be permitted for any concrete work.

D. Form Ties: Snap off metal of fixed length: leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than one-inch diameter; manufactured by Burke, Dayton Superior, or accepted equal.

E. Spreaders: Metal (no wood permitted).

2.02 ACCESSORIES

A. Form Ties: Snap-off metal of adjustable length; cone type; 1 inch break back dimension; free of defects that will leave holes no larger than 1 inch diameter in concrete surface.

B. Form Release Agent: Colorless material which will not stain concrete, absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.

C. Fillets for Chamfered Corners: Wood strips type; 3/4 x 3/4-inch size; maximum possible lengths.

D. Flashing Reglets: 26-gauge thick galvanized steel; longest possible lengths; release tape sealed slots; with alignment splines for joints; securable to concrete formwork; Type CO reglet manufactured by Fry Reglet www.fryreglet.com.

E. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required; of strength and character to maintain formwork in place while placing concrete.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verity lines, levels, and measurements before proceeding with formwork.

3.02 PREPARATION

A. Obtain Architect's approval for use of earth forms for footings.

B. Minimize form joints. Symmetrically align joints and make watertight to prevent leakage of mortar.

C. Arrange and assemble formwork to permit stripping, so that concrete is not damaged during its removal.

D. Arrange forms to allow stripping without removal of principal shores, where required to remain in place.

3.03 APPLICATION

A. Form Release Agent

1. Apply form release agent on formwork in accordance with manufacturer's instructions. Apply prior to placing reinforcing steel, anchoring devices, and embedded items.
2. Do not apply form release agent where concrete surfaces are scheduled to receive applied coverings which may be affected by agent. Soak contact surfaces of untreated forms with clean water. Keep surfaces wet prior to placing concrete.

3.04 CONSTRUCTION

A. Build and erect forms to conform to the required shapes, patterns, lines, grades and dimensions indicated. Forms shall be substantial and tight to prevent any leakage of mortar, properly braced and tied together to maintain their position and shape. Forms shall not deflect under the dead load weight of the plastic concrete or construction loads. Joints in forming material shall be butted tightly and shall bear on solid construction. Provide tool edges where indicated. Completed form work to be checked for grade and alignment to tolerances not exceeding 1/4” in 10’-0” for top of forms and not more than 1/4” in 10’-0” for vertical face.

B. Cast-in Items: Set in formwork all new sleeves, inserts, anchors, and similar items furnished and required under the work of other sections. Brace, anchor and support cast-in-items to prevent displacements and distortions.

C. Clean forms after each use and coat with release agent as required.

D. Space clamps, ties, hangers, and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

E. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.

F. Build in securely braced temporary bulkheads, keyed as required, at approved locations of construction joints.

G. Slope tie-wires downward to outside of wall.

H. During and immediately after concrete placing, tighten forms, posts, and shores. Readjust to maintain grades, levels, and camber.

A. Inserts, Embedded Parts, And Openings

1. Provide formed openings where required for work embedded in or passing through concrete.
2. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.
3. Install accessories in accordance with manufacturer's instructions, level and plumb. Ensure items are not disturbed during concrete placement.

B. Earth Forms

1. Construct wood edge strips at top sides of excavations as indicated on drawings.
2. Provide forms for footings and foundation walls wherever concrete cannot be placed against solid earth.
3. Remove loose dirt and debris from form area prior to concrete placement.
4. Concrete for foundations may be placed directly into neat excavations provided the foundation trench walls are stable as determined by the Architect (Structural Engineer) subject to the approval of The Division of the State Architect.
5. When earth formed foundations are used, the minimum formwork shown on the drawings is mandatory to insure clean excavations prior to and during concrete placement.
6. Provide 3-1/2-inch-high starter wall for all concrete and masonry walls below grade.

C. Form Removal

1. Do not remove forms and bracing until concrete has sufficient strength to support its own weight and imposed loads.
2. Do not damage concrete surfaces during form removal.
3. Store reusable forms for exposed architectural concrete to prevent damage to contact surfaces.
4. Remove formwork in same sequence as concrete placement to achieve similar concrete surface coloration.
5. Forms shall remain in place for not less than the following periods of time. These periods represent minimum cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.

    a. Vertical forms of foundations and walls: 5 days.
    b. Slab edge screens or forms: 7 days.

3.05 CLEANING

A. Clean forms to remove foreign matter as erection proceeds.

B. Ensure that water and debris drain to exterior through clean-out ports.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Reinforcing steel bars, welded steel wire fabric fabricated steel bar or rod mats for cast-in-place concrete.
2. Support chairs, bolsters, bar supports, and spacers, for supporting reinforcement.
3. Fibrous secondary reinforcement for light weight concrete topping.

B. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 03 10 00 – Concrete Forming and Accessories.
3. Section 03 30 00 – Cast-In-Place Concrete.
4. Section 32 16 00 – Site Concrete.

1.02 REFERENCES

A. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, Chapter 19A (ACI 318).

B. ACI 301 - Specifications for Concrete Construction.

C. ACI 315 (SP-66) – Guide to Presenting Reinforcing Steel Design Details.

D. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

E. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

F. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

G. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

H. ASTM A706 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.

I. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete.

J. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

K. CRSI - Manual of Practice.

L. CASI - Placing Reinforcing Bars.

1.03 QUALITY ASSURANCE

A. Perform concrete reinforcement work in accordance with CASI Manual of Standard Practice.

B. Conform to ACI 301 and ACI 315 (SP-66).

C. Conform to CBC California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Submit mill test certificates of supplied concrete reinforcing, indicating physical and chemical analysis, to testing laboratory.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Items as identified on the drawings and as otherwise specified herein.

A. Reinforcing Bars: ASTM A615 / A615M-09b with Supplement S1, marked "S", Grade 60 for #4 bar and larger, Grade 40 for bars smaller than #4.

B. Welded Reinforcement: ASTM A706, Grade 60, deformed bars, unfinished.

C. Welded Steel Wire Fabric: ASTM A185 plain type; coiled rolls; uncoated finish. Furnish 6x6 W2.1xW2.1 welded wire fabric in flat sheets; rolls will not be allowed.

D. Steel Wire: ASTM A82, plain, cold drawn steel.

2.02 ACCESSORIES

A. Tie Wire: Minimum 16-gauge annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete including load bearing pad on bottom to prevent vapor barrier puncture. Comply with CRSI “Recommended Practice for Placing Bar Supports, Specifications and Nomenclature, Latest Edition”.

C. Chairs, Bolsters, Bar Supports, Spacers Adjacent to Architectural Concrete Surfaces: Plastic coated sized and shaped as required. Wood is not permitted as supports for reinforcing. Concrete dobies allowed at foundations and footings only.

2.03 FABRICATION

A. Steel reinforcement shall not be bent or straightened in a manner that will injure the material. Bars with kinks or bends not shown on the Drawings shall not be used. Heating of the bars for bending will not be permitted.

1. Spacers and chairs shall be as specified or detailed and spaced such that steel reinforcement will be carried without deflection. Chairs shall center reinforcing vertically at center of slab thickness.
2. Concrete blocks may be used to support bottom layer of steel in floor slabs on grade
3. Bars shall be in long lengths with laps and splices as shown. Offset laps 8'-0" in adjacent bars. Place steel with clearances and cover as shown. Bar laps shall be as indicated on the drawings. Tie all laps and all intersections with specified wire. Maintain clear space between parallel bars not less than 1-1/2 times nominal diameter for round bars, or twice side dimension for square bars, but in no case shall clear space be less than 1-1/2", nor less than 1-1/2 times maximum size concrete aggregate.
4. Install welded wire fabric in lengths as long as possible. Lap adjoining pieces at least one full mesh and lace splices with wire ties. Offset laps of adjoining widths to prevent continuous laps in either direction.
5. Cut bars true to length with ends square and free of burrs.

B. Drawing Notes: Refer to notes on Drawings for additional reinforcement requirements.

C. Welding of reinforcing bar shall be performed only where indicated on plans and in compliance with AWS D1.4. All welding of reinforcement is to be inspected in accordance with CBC Table 1705A.2.1, Item 5(b).

D. Fabricate in accordance with ACI 315 (SP-66), providing concrete cover specified in Section 03 31 00.

B. Locate reinforcing splices not indicated on Drawings at points of minimum stress. Indicate location of splices on shop drawings.

C. Weld reinforcing bars in accordance with AWS D1.4.

2.04 SOURCE QUALITY CONTROL AND TESTING

A. Source Quality Control and Testing will be performed under provisions of Section 01 45 00 and as required by the Division of the State Architect and District Inspector.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Before placing concrete, clean reinforcement of foreign particles or coatings.

B. Place, support, and secure reinforcement against displacement. Do not deviate from alignment or measurement.

C. Mix fibrous reinforcement into concrete material according to Section 03 30 00.

D. Do not displace or damage vapor barrier required by Section 03 30 00.

3.02 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01 45 00 and as required by the Division of the State Architect and District Inspector.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SUMMARY

A. SECTION INCLUDES:

1. Concrete Formwork.
2. Reinforcement of Concrete.
3. Concrete Placing and Finishing.

B. RELATED SECTIONS

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 03 10 00: Concrete Forming and Accessories.
3. Section 03 20 00: Concrete Reinforcing.
5. Section 06 10 00: Rough Carpentry.
6. Section 07 26 00: Vapor Retarders.
7. Section 09 65 00: Resilient Flooring – Vinyl Composition Tile (for floor flatness requirements).
8. Section 09 65 19: Resilient Flooring – Sheet Vinyl (for floor flatness requirements).
9. Section 09 68 13: Carpeting (for floor flatness requirements).
10. Section 32 16 00: Site Concrete.

1.02 REFERENCES

A. CBC - California Building Code, (CCR) California Code of Regulations Title 24, Part 2, Chapter 19A.

B. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.

C. ACI 117-10 - Specification for Tolerances for Concrete Construction and Materials.

D. ACI 211.1-91 - Standard Practice for Selecting Proportions for Normal Weight, Heavy Weight and Mass Concrete.

E. ACI 301-16 - Specifications for Structural Concrete for Buildings.

F. ACI 302.1R-15 - Guide to Concrete Floor and Slab Construction.

G. ACI 304R-00 - Guide for Measuring, Mixing, Transporting and Placing Concrete.

H. ACI 305R-10 - Hot Weather Concreting.

I. ACI 306R-16 - Cold Weather Concreting.

J. ACI 308-16 - Standard Practice for Curing Concrete.

K. ACI 309R-05 - Guide for Consolidation of Concrete.

L. ACI 318-14 - Building Code Requirements for Structural Concrete.

M. ASTM A615 / A615M-09b - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

N. ASTM C33 / C33M-08 - Concrete Aggregates.

O. ASTM C94 / C94M-09a - Ready-Mixed Concrete.

P. ASTM C114-09b - Methods of Chemical Analysis of Hydraulic Cement.

Q. ASTM C150 / C150M-09 - Portland Cement.

R. ASTM C260-06 - Air Entraining Admixtures.

S. ASTM C289 - Standard Test Method for Potential Alkali-Silica Reactivity.

T. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

U. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.

V. ASTM C494 / C49M-08a - Chemical Admixtures for Concrete.

W. ASTM C567 - Standard Test Method for Determining Density of Structural Lightweight Concrete.

X. ASTM C595/C595M-20 - Standard Specification for Blended Hydraulic Cements.

Y ASTM C618-19 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

Z. ASTM C932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.

AA. ASTM C989/C989M-18a - Standard Specification for Slag Cement for Use in Concrete and Mortars

BB. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.

CC. ASTM C1602/C1602M-22 - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

DD. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

EE. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

FF. ASTM E96 - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.

GG. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers.

HH. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers.

II. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

JJ. ASTM E1745 - Standard Specifications for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

KK ASTM F710 - Standard Practice for Preparing Concrete Floor to Receive Resilient Flooring.

LL. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

MM.National Ready Mix Concrete Association - Plant Certification Program.

1.03 QUALITY ASSURANCE

A. All Concrete for the project shall be controlled concrete of specified strengths, of uniform color, and free from defects liable to adversely affect strength, durability or appearance of the structure or its components.

B. Requirements of Regulatory Agencies: The quality and design of structural concrete shall comply with the requirements of the California Building Code, except where more stringent requirements are specified.

C. Workmanship: Materials and methods used for the production and placement of concrete shall be such as to assure the specified quality and shall conform to applicable requirements of the Building Code for Reinforced Concrete (ACI 318) of the American Concrete Institute, except as otherwise specified in this Section.

1. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement at no expense to the Owner.
2. Proper installation of partitions and equipment requires the floor finish to be level and smooth throughout. Extreme care shall be exercised during all floating and troweling operations to check levels often.
3. Any concrete work which does not comply with tolerances and elevations shown on drawings will be cause for rejection of all work affected, and, if so rejected, such work shall be removed and replaced at no increase in cost to the Owner.

D. Removal and replacement of Defective Concrete Surfaces shall be done in the following manner when, in the opinion of the Architect, such defects may be removed and replaced at no additional cost to the Owner.

1. Rock pockets, voids, spalls, cracks (superficial and structural) and exposed reinforcing shall be removed and replaced.
2. Floor surfaces which exceed the allowable variation in plane or level as specified herein shall be ground, filled, or replaced to obtain the level and plane required. Fill materials, where required, shall be of type approved by the Architect.
3. Surfaces which are not plumb and square, or which do not conform to the lines and levels indicated shall be removed and replaced.

E. Uniformity of Concrete: All aggregates shall be measured by weight and the proportion of water to cement shall be accurately controlled by either automatic measuring devices or calibrated containers. All concrete placed shall be uniform strength and color appearance as well as surface texture.

F. Screeds shall be provided at all construction joints as required to ensure installation of concrete to lines and elevations noted.

G. Ready-Mixed Concrete: ASTM C94 / C94M-09a except as otherwise specified herein. Mix and deliver in accordance with the requirements set forth in ASTM C94 and ACI 301. Continuous Batch Plant inspection is required per CBC Section 1705A.3.3. Contractor may request waiver of batch plant inspection in accordance with CBC Section 1705A.3.3.1 provided the following is met:

1. Approved Testing Laboratory shall check the first batching for each class of concrete and furnish mix proportions to the Licensed Weighmaster.
2. Licensed Weighmaster to positively identify materials as to quantity and to certify to each load by ticket.
3. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt and will transmit two copies of record to the Division of the State Architect (DSA).
4. Do not add water at the site to concrete mixes with a maximum specified WCR unless the water content at batch time provides for a WCR less than specified and this provision, including the quantity of water which may be added at the site, is specifically noted on the Mix Design and Certification by the mix preparer.

5. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished conforms in every particular and to proportions established by mix designs.

H. Concrete Preplacement Inspection: Concrete shall not be poured until the forms, reinforcement, and preparations are complete and have been reviewed by the Project Inspector.

I. Tests: For structural concrete, the Testing Lab shall take four (4) test cylinders of concrete each day for every 50 cubic yards of concrete or fraction thereof being placed. Cylinders shall be made and stored as per instructions given by the testing laboratory and shall be in accordance with ASTM Specifications C-31 / C31M-09 and C-39 / C39M-09a. Cylinders shall be tested for ultimate compressive strength of concrete with one cylinder tested at the age of 7 days and two (from the same batch) to be tested at the age of 28 days, with one cylinder held as a spare for future testing if needed. Tests shall be made by a recognized test laboratory selected by the Owner and approved by the Architect.

1. Cylinders not meeting the required design stresses shall indicate defective concrete and such concrete shall be removed and replaced at no increase in cost to the Owner. Core tests requested by the Contractor to establish design stresses, when cylinder tests indicate defective concrete, shall be paid for by the Contractor.
2. Batch plant inspection as required by the DSA Structural Tests and Inspections Form SSS 103-1.

J. Floor Flatness: Provide certification of floor slab flatness per the requirements of Part 3 below.

K. Preinstallation Meetings.

1. Preinstallation Conference: Conduct conference at Project site.
   a. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      1) Contractor's superintendent.
      2) Independent testing agency responsible for concrete design mixtures.
      3) Ready-mix concrete manufacturer.
      4) Concrete Subcontractor.
      5) Special concrete finish Subcontractor.
      6) Inspector.
      7) Owner’s Representative.
      8) Architect.

   b. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, methods for achieving specified floor and slab flatness and levelness, floor and slab flatness and levelness measurement, and concrete protection.
   c. Sign-in sheet shall be provided at time of meeting to document attendees.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Manufacturer's Data: Submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, joint systems, chemical floor hardeners, and others as may be requested by the Architect.

C. Shop Drawings: Shop drawings sheet size shall be 24" x 30" minimum.

1. Reinforcing Steel: The correctness of the bending diagrams is the responsibility of the Contractor. Identify such shop drawings with a reference thereon to sheet and detail numbers from the contract drawings. No reinforcing steel shall be fabricated without approved shop drawings.
2. Construction joint layout per Part 3 below. Contractor to submit plan based upon design team's layout as shown on drawings. Provide verification that the joint layout will limit the risk of slab cracking. Plans shall include control, and expansion joints.

D. Concrete Mix Design: Submit proposed mix design prepared by concrete supplier. Mix design must be submitted to Owner for review and acceptance by a recognized independent testing lab, for all structural concrete.

E. Historical test data on all proposed mix designs including 28-day strength reports, and verification of aggregate and concrete shrinkage.

F. Test reports for Floor Flatness and Floor Levelness shall be submitted for review after first slab has been poured and prior to subsequent slabs being poured.

1.05 JOB CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required by construction activities.

PART 2 – PRODUCTS

2.01 CONCRETE MATERIALS

A. Portland Cement: ASTM C150 / C150M-09, Type II, low alkali. All cement used shall be of one manufacturer.

1. Use Type IIA cement if pumping of concrete is selected and permitted for placing of concrete.
2. All cement shall contain not more than 0.6 percent total alkali when calculated as sodium oxide as determined by "Methods of Chemical Analysis of Hydraulic Cement", ASTM C114-09b.

B. Blended Cement: ASTM C595/C595M-20, Type IL (MS or (HS).

1. All cement shall not contain more than 0.6 percent total alkali when calculated as sodium oxide as determined by "Methods of Chemical Analysis of Hydraulic Cement", ASTM C114-09b.

C. Supplementary Cementitious Materials:

1. ASTM C618-19 Class N or Class F materials (Class C is not permitted).
2. ASTM C989/C989M-18a Ground Granulated Blast Furnace Slag.

D. Water: ASTM C1602/C1602M-22 Clean and free from deleterious amounts of acids, alkalis, salts and organic matter.

E. Concrete Aggregates: ASTM C33 / C33M-08 except as otherwise specified hereinafter. All aggregates shall be nonreactive and nondegenerative, and shall consist of sound crushed rock, washed gravel, or a combination of both.

1. Aggregate size for structural slabs shall be 1-1/2 inch. Aggregate size for other structural concrete shall be between 3/4 inch and 1-1/2-inch maximum.
2. Aggregate shall be saturated surface dry by batch plant.
3. Modify fine aggregates when air entrained concrete is used in accordance with Paragraph 4.2.4 of ASTM C33 / C33M-08.
4. Aggregate shall result in shrinkage of concrete not exceeding .048 percent at 28 days. Testing lab shall verify aggregate and concrete shrinkage.
5. Do not use fine or coarse aggregates that contain substances that are known to cause spalling or adverse reactions in the concrete.

F. Cementitious Materials:

1. Fly Ash: 40 percent replacement maximum.
2. Slag Cement: 50 percent maximum.
3. Combined Fly Ash and Slag Cement: 50 percent replacement maximum.

E. Air Entraining Agents shall be used in concrete at the contractor’s option. The maximum entrained air content shall be no more than 4 percent + 1 percent by volume. Sika AER, Master Builders Micro Air, Darex AEA, Protex AEA or approved equal meeting ASTM C260/C260M.

F. Admixtures: Except for air entraining agents, and water-reducing admixtures, no other admixtures shall be used without written approval from the Architect. Where such agents are permitted, they shall be a type approved and used only as directed by the Architect and at no increase in cost to the Owner.

1. Calcium chloride will not be permitted for use in concrete under any circumstances.
2. Air Entraining Agents: ASTM C260. Use where specified. The maximum entrained air content shall be no more than 4 percent + 1 percent by volume unless noted otherwise. Approved air entraining agents are Sika AER, Master Builders Micro Air, Darex AEA, Protex AEA or approved equal.
3. Water Reducing Admixtures: ASTM C494 Type A, D, E, F, or G and ACI 318, Section 3.6. Use where specified.

2.02 CRUSHED ROCK BASE:

A. Under all new concrete ramps and paving, or as otherwise indicated on the Drawings, provide a minimum of 4 inches of crushed rock fill. Crushed rock fill shall be clean gravel of 1” max. size and have no material passing through a No. 4 sieve.

2.03 JOINT MATERIAL:

A. Provide 3/8” wide fiber expansion joint material, Model No. 320-F, as manufactured by W.R. Meadows or approved equal.

B. Provide Snap-Cap as manufactured by W.R. Meadows or approved equal. Snap-Cap shall have a top plastic edge that can be used for leveling concrete. Once concrete has set up, top edge of Snap-Cap can be pulled free and discarded. Joint shall then be sealed.

C. Joint sealing material shall be a two-component, self-leveling, polyurethane elastomeric sealant. Product shall be Sikaflex 2cSL as manufactured Sika Corporation, or equal. Color shall be chosen by Architect from the full range of manufacturer’s standard colors.

2.04 RELATED MATERIALS

A. Concrete Adhesive and Bonding Agent: "Concresive #1001-LPL" (1-1/2-hour maximum pot life), an epoxy polysulfide type concrete adhesive as manufactured by Master Builders or approved equal.

B. Liquid Curing Compound: W.R. Meadows, Product: "Vocomp-20" or approved equal.

C. Bonding Adhesive: White Cap Glue, Burke Bondcrete-S or approved equal; use as a modifier for patching and overlays up to 1/2" thick or approved equal.

D. Doweling Epoxy: Hilti “HIT-RE 500” (ICC-ES ESR-3814), Simpson Strong-Tie “SET-3G” Epoxy (ICC-ES ESR-4057) or approved equal.

1. Anchor rods shall be furnished with a 45-degree chisel point on one end to allow for easy insertion into adhesive filled hole and manufactured to meet the requirements of ASTM A36. Nuts and washers shall be furnished to meet the requirements of the anchor rod specifications noted above.
2. Install per manufacturer’s recommendation; use stainless steel for all exterior work.
3. Testing required as noted in the Structural Drawings.

E. Vapor Barrier: Stego Wrap, 15 mil. vapor barrier system, with a Class A rating, and perm rating not to exceed 0.01 perms; by Stego Industries of San Juan Capistrano, CA (877) 464-7834, VaporGuard by Reef Industries (713) 507-4250., Sundance 15 mil Vapor Barrier by Sundance Inc. (855) 300-7156, or 15 mil Husky, Yellow Guard, Vapor Barrier by Poly-America (800) 527-3322. No other substitutions will be accepted. System to include Stego Mastic, Stego “Crete Claw Tape” and pipe boots, or approved equal by the specified manufacturers. Conform to ASTM 1745.

F. Patching Mortar: Meadow-Crete GPS, one-component, trowel applied, polymer enhanced, shrinkage-compensated, fiber reinforced, cementitious repair mortar for horizontal, vertical and overhead applications as manufactured by W.R. Meadows or approved equal.

G. Non-shrink Grout: Masterflow 713 Plus by Master Builders or approved equal. Premixed, non-metallic, no chlorides, non-staining, and non-shrinking per CRD-C621, Corps of Engineers Specification and ASTM C 1107, Grades B and C.

2.05 CONCRETE DESIGN

A. The concrete mix shall be per the approved drawings unless otherwise noted. See Section 32 16 00 for site concrete

1. Laboratory Mix Design: Concrete designs, using Methods B or C, Section 1905.1.1 of the CBC, Title 24, shall be reviewed by the Testing Laboratory. The concrete mix designs reviewed by the Testing Laboratory and approved by the Project Architect or Structural Engineer shall be used by the Contractor. Contractor shall provide samples of aggregates as required by the laboratory to review the mix designs. Laboratory shall also include shrinkage tests.
2. Water Reducing Admixture: All concrete shall contain a water reducing admixture.
3. Air Entraining Agent: Include in all concrete in all exterior concrete to result in concrete at point of placement having an air entrainment of 4% (+/- 1%).
4. Maximum water - cement ratio at point of placement: 0.45.

B. Ready-Mixed Concrete: ASTM C94 / C94M-09a except as otherwise specified herein.

1. Transit-mixed concrete shall be mixed for a period of not less than 10 minutes at a peripheral drum speed of approximately 200 feet per minute, and mixing shall be continued until discharge is complete. At least 3 minutes of the mixing period shall be at the job. Transit mixers shall be equipped with water measuring devices consisting of either accurately calibrated water tanks or water meters.
2. When outside air temperature is between 85 degrees and 90 degrees, reduce mixing and delivery time from 90 minutes to 75 minutes. When outside air temperature is above 90 degrees, reduce mixing and delivery time to 60 minutes.

C. Job Mixing: The capacity of the mixer shall be such that it will handle one or more full sack batches. No split sack batches will be permitted except when all materials are weighed. The rated capacity of the mixer shall not be exceeded. The mixing drum shall be equipped with an automatic timing and locking device and with an accurate water gauge for measuring the amount of water used. Mixing time of each batch shall be at least 1-1/2 minutes after all ingredients are in the mixer.

D. Slump of Concrete: The slump of concrete as determined by the Standard Test Method for Slump of Hydraulic Cement Concrete ASTM Designation C-143 / C143M-09 shall be as follows:

1. All Concrete: 4 inches maximum, plus/minus 1 inch (5 inch maximum).

PART 3 – EXECUTION

3.01 CONCRETE PLACEMENT

A. Surrounding Conditions: Before any concrete is placed, the following items of work shall have been completed in the area of placing.

1. Forms shall have been erected, braced, cleaned, sealed, lubricated if required, and bulkheaded where placing is to stop.
    a. Any wood forms other than plywood shall be thoroughly water soaked before placing any concrete. The wetting of forms shall be started at least 12 hours before concreting.

2. Reinforcing steel shall have been placed, tied, supported, and, at time concrete is placed around it, shall be cleaned of rust, scale, mill scale or other coatings that will destroy or reduce bond.
3. Embedded work of all trades shall be in place in the forms, tied and braced.
4. The entire place of deposit shall have been cleaned of dirt, chips, sawdust, rubbish, debris, hardened concrete, and other foreign matter before concrete is deposited therein. No wooden ties nor blocking shall be left in concrete except where indicated for attachment of other work.
5. Concrete surfaces to which fresh concrete is to be bonded shall be roughened as indicated. Surfaces shall be brush cleaned to remove all dust and foreign matter and to expose the aggregate, and then coated with the bonding adhesive herein specified.

B. Conveying Concrete from mixer to forms shall be as rapid as possible.

1. Ready-mixed concrete shall be mixed and delivered in accordance with ASTM C94 / C94M-09a. A delivery ticket shall be furnished for each load of ready-mix or transit-mix concrete. A copy of each delivery ticket shall be handed to the job superintendent at the time of delivery and unloading. A record copy of the delivery tickets shall be forwarded to the Architect for their files.
2. Conveying equipment shall be of a sufficient capacity to ensure a continuous flow of concrete to the placing point without separation or loss of materials. Carts and buggies shall be equipped with pneumatic tires. Runway supports shall not bear on reinforcing or fresh concrete. All conveying equipment shall be thoroughly cleaned before beginning and at frequent intervals during the placing of the concrete.
    a. Chutes, if employed, shall slope not less than 4" or more than 6" per foot of horizontal run.

3. Exercise care not to spill concrete on forms & reinforcing steel during the conveying operations. Where such spillage or splattering occurs, the surfaces shall be thoroughly cleaned before concrete hardens.

C. Placing Concrete: Notify the Architect 48 hours in advance of beginning of pouring operations. Under no circumstances shall concrete that has partially hardened be deposited on the work. No concrete shall be placed during rainy weather without the Architect's approval.

1. The Project Inspector shall keep a record on the site of the time and date of placing the concrete in each portion of the structure in accordance with CBC Section 1705A.3.6. The record shall be kept until the completion of the structure and a copy provided to the Architect and DSA.

2. Before starting new pour on or against concrete that has hardened, forms shall be retightened, and the hardened concrete roughened and thoroughly cleaned of foreign matter and any laitance by sandblasting. Just ahead of the new pour, slush joints with a 2" layer of grout of the designated concrete mix minus 50 percent of the large aggregate.

3. Reinforcing steel exposed to the sun shall be cooled by a water spray prior to the placing of concrete.

4. No adjustment of steel reinforcement will be permitted during the placement of concrete.

5. Concrete shall be scheduled so that the placing is a continuous operation for the completion of each section between predetermined construction joints. If a planned concreting operation cannot be carried on continuously, the concreting shall stop at temporary bulkheads. Locate where resulting construction joints shall be as shown on the Drawings or as approved by the Architect. Prior to placing of concrete for any concrete slabs, the moisture content of the subgrade below the slabs shall be adjusted to at least optimum moisture.

6. Deposit the concrete in forms as nearly as practicable in its final position to avoid flowing and maintain until completion of the unit an approximate horizontal plastic surface. Thoroughly compact all concrete during placing operations, thoroughly around reinforcement, embedded fixtures, or accessories, and into the corners of forms to eliminate air pockets and honeycombing. Compacting shall be done with mechanical vibrators. Vibrators shall not be used to cause concrete to flow horizontally. Thoroughly compact concrete to the forms to release the air and secure full contact of the concrete with the forms.

7. Hot Weather Concreting: Concrete placing and finishing operations during hot weather shall be done as quickly as possible. Ample personnel shall be available to manage and place the concrete immediately after its mixing or delivery to the site of the work. Concrete shall be placed in layers thin enough and over areas small enough to ensure complete bond and union of adjacent layers, and thus prevent "cold joints".
   a. At air temperature of 80 degrees Fahrenheit or above, the following precautions should be taken:
      1) In no case shall the temperature of the concrete exceed 90 degrees Fahrenheit when placed in the work.
      2) If necessary, to produce and maintain concrete at an acceptable temperature, chopped or crushed ice shall be added directly into the mixer up to 50 percent by weight of the mixing water used, the weight of the ice being included in batch weight of the mixing water. The ice shall be added at such a rate and in such a manner that it will be completely melted by the time concrete is mixed.
      3) Stockpiled aggregates shall be saturated and kept surface moist by continuous fog spray or by intermittent sprinkling.
      4) Forms, reinforcements, and subgrade surfaces shall be wet down immediately before concrete is placed in contact therewith. Remove all excess water before placing concrete. Wetting down of areas around the work to cool the surrounding air and increase the humidity is recommended.

8. Cold Weather Requirements: Do not place concrete when ambient temperature is below 40 degrees Fahrenheit and falling.

3.02 CONCRETE FINISHING

A. All Concrete Work, except as otherwise specified, shall be of a quality that will present a finished appearance upon the stripping of the forms. Only a minimum of patching and finishing should be necessary as required to fill holes left by form ties and to remove any fins or minor irregularities left by the joints in the forms. Except as otherwise specified, all concrete surfaces shall be finished as follows:

B. Float finish: Begin float finish when bleed water sheen has disappeared, and the concrete surface has stiffened sufficiently to permit operations. Float surface with power driven floats, or by hand-floating if area is small or inaccessible to power units. Finish surfaces to true planes within a tolerance as specified in 3.04-C. Cut down high spots and fill low spots. Refloat surface immediately to a uniform granular surface.

   1. Final Finish: Provide a medium textured broom finish for all exterior surfaces by drawing a soft bristle broom across concrete surface perpendicular to line of traffic to provide a uniform fine line texture finish.
   2. No magnesium bull floats allowed on non-air entrained concrete.

C. Floor Flatness and Floor Level Tolerances:

   1. An independent testing agency will inspect finished slabs for compliance with specified tolerances.
   2. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values at slabs on grade and shored slabs:
      a. Exposed to View and Foot Traffic: F(F) of 35; F(L) of 25.
      b. Under Thick-Bed Tile: F(F) of 20; F(L) of 15.
      c. Under Carpeting: F(F) of 25; F(L) of 20.
      d. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25.

   3. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 72 hours after slab installation; report both composite overall values and local values for each measured section.
   4. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.
   5. Correct defects by grinding, floating with leveling compound, or by removal and replacement of the defective work. Areas requiring corrective work to be identified by Contractor and a repair/replacement plan shall be submitted for review by Architect. Re-measure corrected areas by the same process.

D. Curb Finishing: Steel trowel as described for slab finishing above.

E. Final Tooling: Tool edges of paving, gutters, curbs, and joints formed in fresh concrete with a jointing tool to a radius of 1/4”. Repeat tooling of edges and joints after applying surface finishes. Eliminate tools marks on all concrete surfaces.

F. Forms shall remain in place for not less than the following periods of time. These periods represent minimum cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.

   1. Vertical forms of foundations and walls: 5 days.
   2. Slab edge screens or forms: 2 days.
   3. Concrete columns and beam soffits: 28 days.

3.03 CONSTRUCTION JOINTS

A. NO SOFTCUT (SAWCUT) CONTROL JOINTS ALLOWED.

B. Construct contraction, construction, and isolation joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to the centerline unless otherwise indicated.

C. Joints at Existing Concrete: All joints between existing concrete and new concrete or at sawcut locations through existing slabs are to include dowels at a minimum of #4 bars @ 4'-0" on center, 18" maximum from the ends, epoxy set into existing concrete a minimum of 6" in length at the centerline of existing concrete slab.

D. Contraction Joints (Control Joints): Provide weakened-plane contraction joints, sectioning concrete into areas indicated. Construct contraction joints for a depth equal to at least 1/4 of the concrete thickness unless otherwise noted on drawings. Form in fresh concrete by grooving and finishing each edge of joint with a radiused jointer tool. **Joints to be spaced at 10' on center maximum or as shown on the drawings.**

E. Construction Joints: Set construction joints at side and end terminations of concrete placement and at locations where placement operations are stopped for more than 1/2 hour unless placement ends at isolation joints.

1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys. Use Burke "Keyed Kold Joint Header Form" or approved equal. Embed keys at least 1 1/2" into concrete.
2. Provide slip dowels across construction joints.

F. Isolation Joints (Expansion Joints): Form isolation joints of performed joint filler strips abutting concrete curbs, catch basin, utility access holes, inlets, structures, walks, other fixed objects, and where indicated.

1. Extend joint fillers full width and depth of joint, not less than 1/2" or more than 1" below finished surface where a joint sealant is indicated. Place top of removable joint filler flush with finished concrete surface.
2. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary, removable performed cap.
3. After concrete has cured, remove cap exposing top edge of fiber joint filler, and apply joint sealant.

3.04 PUMPING OF CONCRETE (may be permitted for concrete, providing):

A. The Contractor engages a testing laboratory to design concrete mixes for pumping. Trial batches shall be made and tested as required hereinbefore for typical concrete.

B. The quality and proportioning of aggregates for pumping conditions shall be determined in accordance with ACI, Recommended Practice 613. Aggregate proportioning must be tailored to the pump intended for use.

C. When starting a pump operation, actual pumping of concrete shall be preceded by a mortar mix (concrete without coarse aggregate) for the purpose of lubrication.

D. All mortar and concrete leakage resulting from pumping operations shall be removed from formwork, reinforcing steel and any finished surface.

3.05 CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperature. Comply with the recommendations of ACI 306R for cold weather protection and ACI 305R for hot weather protection during curing.

B. Evaporation control is to be implemented in hot, dry and windy weather by protecting concrete from rapid moisture loss before and during finishing operations with an evaporation control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but not before floating.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination.

1. For moisture-curing, keep surfaces continuously moist for not less than 7 days with water, a continuous water-fog spray, or absorptive cover kept wet continuously wet.
2. For moisture-retaining-cover, cover concrete with moisture retaining cover with side and end laps sealed.
3. For curing compound, apply in accordance with manufacturer's instructions. Recoat areas subjected to rainfall within 3-hours after initial application.

3.06 CLEANING AND PROTECTION

A. Clean all surfaces and leave in satisfactory condition to receive final finish surface treatment.

B. Protect concrete surfaces from damage by tools, equipment, material, and workers. No traffic, shoring or other loading will be permitted until concrete has hardened sufficiently to prevent injury to finish and strength, but at least 14 days.

1. Remove surface stains and spillage of materials as they occur.
2. Sweep concrete and wash free of stains, discolorations, dirt, and other foreign material prior to final inspection.

3.07 INSPECTION

A. Approval of reinforcing steel, after installation, must be received from Project Inspector. Architect, Structural Engineer, and DSA must be notified 48 hours in advance of beginning concrete placement operations. Inspection of welding will be done by laboratory.

B. There will be initial or preliminary inspection of the finished concrete slabs by the Project Inspector and/or Architect for overall finish.

C. Slabs shall be measured for FF and FL as required by 3.02-C and findings submitted to Architect.

D. New pours will be reviewed for cracks. If during this inspection, cracked sections are found and determined unacceptable by the District, that section should be removed and replaced.

E. Final concrete inspection: Prior to occupancy, concrete will be reviewed by Owner and Architect. If any cracks, spalls, exposed finish layer seperation, etc. are identified, that section(s) shall be removed and replaced.

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

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- 2025-01-31 – Added new section needed to complement SS 04 22 00.
- 2025-11-11 – Updated from CBC 2022 to CBC 2025 as applicable
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DISTRICT DESIGN STANDARDS

Notice to All Users and Designers!

In many cases, the District does not govern the technical 3-part specifications for the Design Team. The design standards information shown below is provided to convey the District's intentions on manufacturers, products and procedures that the District does or does not want to be used on their projects. The items listed below are to assist you with understanding what needs to be reflected in your 3-part specification without forcing a pre-written specification upon you. Where a 3-part specification section is provided by the District, the items below are design parameters to be considered when applying this specification section to your design. The design team shall confirm and coordinate all product and system requirements with the District during design regardless of them being design standards or full 3-part specifications.

When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

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All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- None at this time.

SECTION 04 10 00

MORTAR AND GROUT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Provide all materials, labor and accessories as required and specified for complete mortar and grout installation in masonry walls.

B. Related Work:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 03 20 00: Concrete Reinforcing.
3. Section 03 30 00: Cast-in-Place Concrete.
4. Section 04 22 00: Concrete Unit Masonry.
5. Section 31 16 00: Site Concrete.

1.02 QUALITY ASSURANCE

A. Standards and References: (Latest Edition unless otherwise noted)
1. ASTM C144, Aggregate for Masonry Mortar.
2. ASTM C150-24, Portland Cement.
3. ASTM C207-25a, Hydrated Lime for Masonry Purposes
4. ASTM C404-24, Aggregates for Grout
5. ASTM C1019-25, Method of Sampling and Testing Grout
6. ACI 530/ASCE 5, Building Code Requirements and Specification for Masonry Structures
7. 2025~~2~~ California Building Code (CBC), Volumes 1, 2, 3, with State of California Amendments

B. Tests and Inspections:
1. All tests and inspections herein are to be performed by an independent testing laboratory approved by the building official.
2. Mortar and Grout Tests: At the beginning of Masonry Work, at least 1 test sample each of mortar and grout shall be taken on 3 successive working days, then once per week with at least one sample taken for each 5000 square feet of wall area, or fraction thereof.
   a. Test specimens shall be made in accordance with CBC~~S~~ Section 2105A.2.
   b. Test specimens shall be continuously stored in moist air until tested.
   c. Mortar shall show a compressive strength of not less than 1800 psi at 28 days. Grout shall show a compressive strength of not less than 2000 psi at 28 days.

Commented [JR1]: Same same

3. A special inspector shall be employed per CBC Section 1704A.5 during the placement of all units, placement of all reinforcing steel, during all grouting operations and during taking of all test specimens.

Commented [JR2]: Same same

C. Submittals:
   1. Mix design for mortar and grout shall be submitted for review.
   2. Supplier's certificates indicating materials comply with the specifications below. They shall include but are not necessarily limited to:
      a. Aggregates
      b. Cement
      c. Admixtures
   3. Color samples of manufacturer's full range of standard colors.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cement: ASTM C-150-24, Type I or II, low alkali; natural gray.

B. Hydrated Lime: ASTM C-207-25a, Type S.

C. Quicklime: ASTM C-5-24, non-hydraulic type.

D. Lime Putty: Made from hydrated lime or quicklime.
   1. If made from quicklime, other than processed pulverized quicklime, slake lime and then screen through a No. 16 mesh sieve. Before using, store and protect slaked and screened lime putty for not less than 10 days.
   2. Processed pulverized quicklime shall be slaked for not less than 48 hours, and shall be cool when used.
   3. Lime putty prepared from hydrated lime may be used immediately after mixing.
   4. Lime putty prepared from quicklime or pulverized quicklime shall have a plasticity figure, after slaking and screening, of not less than 200, and shall weigh not less than 83 lbs. per cubic foot. Lime putty prepared from hydrated lime shall conform to ASTM C-207-25a, Type S.

E. Aggregate:
   1. For Mortar: ASTM C144-14(2021).
   2. For Grout: ASTM C404-24, ~~evnly~~evenly graded with 3/8" maximum size.

F. Admixture: "Sika Grout Aid"

G. Water: Suitable for domestic consumption.

H. Colorant: Basalite Color, Davis Color, or equal. Allow for multiple grout colors which shall correspond to each CMU type used. Unless otherwise indicated on the drawings, exposed grout shall best match adjacent CMU color. Grout colors will be selected by Architect at time of submittal.

2.02 MORTAR

A. Mortar shall be Type S having a 28 day compressive strength of not less than 1800 psi, and shall conform to ASTM C-270-25a, Type S.

B. Mortar shall be made with admixtures that are proportioned, added and mixed in strict accordance with manufacturer's directions.

C. Mortar mix shall be proportioned by volume; one part portland cement, not less than 1/4 part nor more than ½ part lime putty, and sand totaling not less than 2¼ nor more than 3 times sum of volumes of cement and lime used.
   1. Total clay content shall not exceed 2% of sand content or 6% of cement content.

D. Mortar at exposed, unfinished masonry shall be Basalite No. S296 (green) and S205 (white) to match or as otherwise selected by Architect to best match block colors.

2.03 GROUT

A. Grout (per ASTM C476) shall have a 28-day compressive strength of not less than 2000 psi. Proportion by volume, and with sufficient water to produce consistency for pouring without segregation so that grout will flow into masonry joints. Grout shall conform to CBC Section 2103A.~~1~~3.

B. Fine Grout: 1 part portland cement, to which may be added not more than 1/10 part lime putty, and 3 parts sand.
   1. Fine grout shall be used for all grout spaces less than 3" wide.

C. Coarse Grout: 1 part portland cement, to which may be added not more than 1/10 part lime putty, 3 parts sand and not less than 1 part nor more than 2 parts pea gravel (3/8" maximum aggregate size).
   1. Coarse grout shall be used in grout spaces 3" wide or more.

D. Add "Sika Grout Aid" admixture to grout at the rate of 1 pound per 100 pounds cementititous material.

PART 3 - EXECUTION

3.01 MIXING MORTAR AND GROUT

A. Accurately measure materials in suitably calibrated devices; shovel measurements are not acceptable. Each 94lb. sack of portland cement will be considered as 1 cubic foot.

B. Place sand, cement and water in mixer in that order and mix for at least 2 minutes; then add lime putty and continue mixing as long as necessary to secure a uniform mass, but in no case less than 10 minutes.

C. Use mixers of at least 1 sack capacity; batches requiring fractional sacks will not be permitted unless cement is weighed for each batch.

3.02 GROUTING PROCEDURES

A. Specified under Sections 04 22 00.

3.03 RETEMPERING

A. When necessary to retemper mortar, add water and remix; retempering by dashing water over mortar will not be permitted.

B. Any mortar or grout which is unused within 30 minutes after initial mixing and any mortar or grout that has begun to set shall not be used.

3.04 DEFECTIVE MORTAR OR GROUT

A. Should the strength of mortar or grout fall below that specified, remainder of Work shall be adjusted to reach required strength. Work in place representing inferior grout and mortar and indicating a strength less than the minimum specified shall be tested by taking and testing core samples. Number and location of cores shall be determined by Structural Engineer.

B. Should compression tests of cores fail to meet required strength, masonry shall be deemed to be defective and shall be removed and replaced at no cost to Owner.

C. Costs relative to taking and testing of core samples shall be paid by Owner and will be deducted from Contract Amount. Cost of patching core holes shall be borne by Contractor.

END OF SECTION

SECTION 05 50 00

METAL FABRICATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Shop fabricated ferrous metal items, galvanized and prime painted.
2. Schedule of metal fabrications.

B. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. 09 91 00 - Painting.

1.02 REFERENCES

A. ASTM A36 - Standard Specification for Carbon Structural Steel.

B. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

C. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized} Coatings on Iron and Steel Products.

D. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.

F. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

G. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

H AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.

I AWS D1.1 - Structural Welding Code - Steel.

J. SSPC - The Society for Protective Coatings.

1.03 SUBMITTALS

A. Submit under provisions of Section 01 33 00.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Provide specific submittal for all ramp and sloped walk guide rails, handrails, and guardrails prior to fabrication clearly showing spacing of rails and embed details.

C. Indicate welded connections using standard AWS A2.1 welding symbols. Indicate net weld lengths.

1.03 QUALITY ASSURANCE

A. Welders' Certificates: Submit under provisions of Section 01 33 13, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

B. Field Measurements

1. Verify that field measurements are as indicated on Drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Steel Sections: ASTM A36.

B. Steel Tubing: ASTM A500, Grade B.

C. Plates: ASTM A36.

D. Pipe: ASTM A53, Grade B, Schedule 40.

E. Bolts, Nuts, and Washers: ASTM A307 galvanized to ASTM A 153 for galvanized components.

F. Welding Materials: AWS D1.1; type required for materials being welded.

G. Shop and Touch Up Primer: SSPC 15, Type 1, red oxide.

H. Touch-Up for Galvanized Surfaces: Zinc rich galvanizing paint. Must contain either between 65% to 69% metallic zinc by weight or greater than 92% metallic zinc by weight in dry film. "Brite" sheen required at exposed galvanized finish. Spray application not acceptable; brush applied only.

2.02 EQUIPMENT SUPPORT SYSTEM

A. Provide galvanized Unistrut, or other approved.

1. Main Runner: P5500 channel at 8-foot centers.
2. 5/8-inch hanger rods at 48 inches on centers and hanger clamps.
3. Cross Runner: P3000 channel at 4-foot centers.
4. P3047 "U" shaped fittings.
5. Provide and size pipe clamps as required.
6. Provide hardware and accessories as required.

2.03 FABRICATION

A. Fit and shop assemble in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds unless indicated otherwise.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FINISHES

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Prime paint items with one coat.

D. At surfaces scheduled to be galvanized: Galvanize assembled items to minimum 1.25 oz/sq ft zinc coating in accordance with ASTM A 123. Apply brush applied zinc-rich galvanizing paint over field welds and adjacent areas where hot dipped galvanizing has been damaged. “Brite” sheen required at exposed galvanized finishes.

E. Repair damaged galvanized surfaces in accordance with ASTM A780 Method A2.

F. Finish: Site paint exposed to view prime painted and galvanized items under provisions of Section 09 91 00.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Beginning of installation means erector accepts existing conditions.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on Drawings.

D. Perform field welding in accordance with AWS D1.1.

E. Obtain Architect approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

G. WELDING

1. Except for modifications indicated on drawings and specified herein, AISC Code of Standard Practices for Steel Buildings, and AWS Code for Fusion Welding and Gas Cutting in Building Construction, both as amended to date, govern materials, fabrication and erection of work under this Section.

2. Make welds in accordance with best standard practice. Perform welding on unexposed sides to prevent pitting, discoloring, weld-halo and other surface imperfections. Thoroughly clean surfaces to be welded. Welds must show a uniform section and reasonable smoothness without distortion. No exposed spot welding permitted. Dress and finish exposed surfaces of welded joints to produce invisible connections. Furnish welding alloys in the same color and character as the surfaces of the metals joined.

3.04 CONSTRUCTION

A. Insofar as possible, fit and shop assemble work ready for erection. Accurately make jointing and intersections in true planes, and with adequate fastenings. Make exposed joints even and smooth. Grind exposed weld joints smooth and flush.

B. Provide holes of proper size and in correct location for attachment of work of other trades. Cut, tape, and drill as required. Finished items must be free from kinks, twists, burrs and open joints. Damaged or distorted materials are not acceptable.

C. Provide work to be built in concrete or masonry of proper form required for anchorage, or provide with concealed anchors.

D. Form work true to detail, with clean, straight and sharply defined profiles. Close fit exposed joints and make where least conspicuous.

E. Install supporting members, fastenings, frames, hangers, bracing, brackets, bolts, angles, and the like as required to set and connect items of miscellaneous metal to concrete, steel or wood framing.

F. Countersink holes for exposed screwheads. Provide necessary lugs, brackets, and clips so work can be assembled and installed in a neat and suitable manner.

G. Conceal fastenings where possible. Unless otherwise indicated, provide flathead or countersunk oval bolts and screwheads as best suited for the purpose.

H. Weld in place plates for mounting item(s) of finish hardware.

I. Provide bolts, anchors, inserts, and other miscellaneous steel and iron fastenings in forms before concrete is poured; or as to be built into masonry, as indicated on drawings, details or schedules, or as necessary to complete the work. Examine and check the Architectural, Structural, Mechanical and Electrical Drawings for number, type and locations of each item.

J. MISCELLANEOUS ITEMS

1. Furnish, fabrication, and install miscellaneous angles, channels, bent plate, clips, anchors, and other miscellaneous metal work required and as indicated on drawings. Form as detailed or if not detailed, as required for location and purposes served, and in accordance with the applicable provisions specified herein. Furnish and install miscellaneous metal items not specifically mentioned herein, or in other sections, but which are customarily considered as part of the work, the same as if fully specified herein and detailed on drawings.
2. Furnish and install light steel structural items not noted on Structural Drawings or called for under "Structural Steel" section but which are shown on the other drawings.
3. Furnish and install sleeves through masonry or concrete walls and footings. Fabrication of standard weight steel section of size sufficient to allow ¼ inch clearance between the sleeve and item to be inserted.
4. Furnish and install anchors, brackets, and plates or suitable steel where required in connection with steel, masonry, wood and concrete construction.

5. Fabricate steel channel and angle frames for doors, duct openings, scuttles, mechanical equipment, louvers, and other frames as shown and detailed to exact size required and in accordance with approved shop drawing. Neatly join corners, weld and grind smooth. For securing to concrete or masonry, weld concealed anchors on the back. Secure bar stops to frames with countersunk flathead screws or plug weld from the back. Prepare steel frames to receive necessary hardware. Where mechanical equipment such as fans, blowers, etc., and sheet metal are shown or specified to be attached in steel frames, the drilling, tapping and attachment must be done by trade involved.
6. Furnish corner guards, bumpers, etc., of sizes and shapes indicated and with anchors welded tot he backs and of sizes and spacing shown.
7. Provide hot-dipped galvanized steel and iron for exterior use.

K. FINISH

1. Except where indicated, or specified to be galvanized, clean miscellaneous steel and iron of any grease, rust, mill scale, or other foreign matter, and give one shop coat of the specified primer: Do not prime material to be embedded in concrete.

2. After welding is completed, repair damage to the galvanizing by applying a minimum of two coats of liquid galvanizing compound in accordance with manufacturer's instructions to provide a coating equal to original finish.

3.05 SCHEDULE

A. The Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

B. Miscellaneous Framing and Supports: Steel not a part of structural steel framework as required to complete work; galvanized prime paint finish.

C. Joist Hangers: Joist strap anchors, galvanized prime paint finish.

D. Ledge and Shelf Angles, Channels and Plates Not Attached to Structural Framing: For support of metal decking, joists, masonry, galvanized, and prime paint finish.

E. Lintels: As detailed; galvanized prime paint finish.

F. Metal Gates and Fences: Welded tubular steel as detailed, complete with all necessary hardware; hot-dipped galvanized, primed with paint finish.

G. Steel pipe railing: hot-dipped galvanized at exterior, primed and painted at interior.

H. Pipe rail wall support brackets: hot-dipped galvanized at exterior, primed and painted at interior.

I. Steel pipe downspouts and downspout support brackets: hot-dipped galvanized and painted.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Description of requirements for materials, fabrications and installation of rough carpentry and associated items (except that which is specified elsewhere) indicated on Drawings and necessary to complete the work. Items include, but are not necessarily limited to, the following:
   a. Blocking, Backing, Stripping, Furring, and Nailers.
   b. Rough Hardware.
   c. Wood Framing.
   d. Plywood Sheathing.
   e. Preservative Treatment.
   f. Metal Fabrications.

B. Related Sections

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 03 30 00: Cast-in-Place Concrete.
3. Section 05 50 00: Metal Fabrications.

C. References

1. Chapter 23, California Building Code (CBC), 2022, as adopted by the California Division of the State Architect (DSA).
2. American Society for Testing and Materials (ASTM).
3. Lumber: West Coast Lumber Inspection Bureau (WCLIB), Rule 17, Standard Grading Rules for West Coast Lumber.
4. Lumber: Western Wood Products Association (WWPA); Western Lumber Grading Rules.
5. Plywood: American Plywood Association (APA) Plywood Specifications and Grades and Voluntary Product Standard DOC PS 1 “Construction and Industrial Plywood”.
6. Wood Preservative: American Wood Protection Association (AWPA), Standard U1.
7. AWC NDS – National Design Specification for Wood Construction.
8. AWC SDPWS – Special Design Provisions for Wind and Seismic.

1.02 QUALITY ASSURANCE

A. Manufacturer data: Submit product data for all materials specified under this section and as applicable to each site.

B. Coordinate the work of all trades to ensure proper placement of all materials, anchors, etc., as well as providing for openings and anchors for the installation of surface mounted materials and equipment.

C. Qualifications of Workmen: Provide sufficient skilled workmen and supervisors who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.

D. Rejection: In the acceptance or rejection of rough carpentry, no allowance will be made for lack of skill on the part of the workmen.

E. Design Criteria: Pressure treatment shall not adversely affect application, permanence, or appearance of finish paint system.

1.03 SUBMITTALS

A. Submit per the requirements of the General Conditions.

B. Certification:

1. Pressure Treated Wood: Certification for water-borne preservative that moisture content was reduced to 19% maximum, after treatment.
2. Pressure Treated Wood: Submit certification by treating plant stating the chemicals and process used, net amount of salts retained, and conformance with applicable standards.

1.04 JOB CONDITIONS

A. Environmental Requirements: Maintain uniform moisture content of lumber at 19 percent or less prior to close-in.

B. Sequencing: Coordinate details with other work supporting, adjoining, or fastening to rough carpentry work.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protection, General: Protect wood from moisture while being stored and while work is in progress.

B. Protection:

1. After delivery, store all materials in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather.

2. Keep all material clearly identified with all grade marks legible; keep all damaged material clearly identified as damaged, and separately store to prevent its inadvertent use. Do not allow installation of damaged or otherwise non-complying material.
3. Use all means necessary to protect the installed work and materials of all other trades.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Wood:

1. Lumber (Blocking, Backing, Stripping, Furring, and Nailers): WCLIB Construction.
2. Lumber (Wood Framing): Meet requirements of following minimum grades, and as noted on Structural Drawings.

Item	Species	Grade	Reference
Studs	D.F.	No. 1	WCLIB 121
Plates	D.F.	No. 1	WCLIB 123b
Beams	D.F.	Select Structural	WCLIB 130b
Joists	D.F.	No. 1	WCLIB 123b
Posts	D.F.	Select Structural	WCLIB 131b

3. 3x and larger lumber shall be free of heart center.
4. 2x6 T & G Douglas Fir No. 1.

B. Plywood:

1. Roof and Wall Structural Sheathing: PS-1 Structural 1, CDX APA with exterior glue.
2. Thickness and type shall be as indicated on Drawings.

C. Pressure-Treated Lumber:

1. Douglas Fir, pressure treated.
   a. Required for cast-in-nailers, sills or anywhere wood is in contact with concrete, masonry, or grout.
   b. Required for all rooftop blocking.

D. Building Paper: Fed. Spec. UU-B-790a, Type I, Grade B (15 lb. min.).

E. Preservative Treatment

1. Furnish pressure treated Douglas Fir in accordance with AWPA, Standard U1. Each piece is required to bear AWPA stamp.
2. Field treat cut edges and holes frilled in factory treated lumber with an approved AWPA Standard U1 preservative product.
3. For fastener requirements, see Paragraph 2.01-F-8.

F. Rough Hardware Fastenings and Connections: All types including bolts, lag screws, nails, spikes, screws, washers, framing devices and other rough hardware, or kinds that may be purchased and that require no further fabrication, shall be furnished, and installed for all finish and rough carpentry. All exterior hardware shall be hot-dipped galvanized per ASTM A123 / A123M-09 Standards.

1. Nails: ASTM F1667 Common wire nails or spikes; box nails not permitted.
2. Wood Screws: Wood Screws: ANSI Standard B18.6.1; use galvanized type for exterior work.
3. Lag Screws: Conform to ASTM A307-07b and ANSI Standard B18.2.1. Dimensions and installation shall conform to requirements described in the National Design Specification (NDS), current edition.
4. Bolts: ASTM A307-07b, Grade A, hexagonal heads, unless noted otherwise.
5. Washers: Washers for bearing against wood shall be provided under all bolt heads and nuts. Washers shall be as indicated on Drawings.
6. Powder Driven Fasteners: Tempered steel pins with special corrosive-resistant plating or coating. Pins shall have guide washers to accurately control penetration, minimum 1-1/8 inch. Fastening shall be accomplished by low-velocity pistol-driven powder activated tool. Pins and tool shall be as manufactured by Hilti Fastening Systems; Impex Tool Corporation; or approved equal. ICBO approved.
7. Fabricated Sheet Metal Timber Framing Connectors: CBC approved. Fabricate from hot-dipped galvanized steel. Connectors shall be at least 18 gauge minimum material (1/8" plate materials where welded, unless otherwise noted), punched for nailing. Nails and Nailing shall conform to the manufacturer's instructions with a nail provided for each punched hole. Types as noted on Drawings, manufactured by Simpson Co. or approved substitute. All framing connectors shall be stamped with manufacturer's logo, and model designation.
8. All fasteners into preservative-treated and fire-retardant-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper per CBC 2304.10.5. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

G. Exterior Trim and Fascia: RIS Grade Stamped, Redwood, B Heart, Vertical Grain, Kiln Dried, surfaced sizes as indicated on the drawings.

2.02 FABRICATION

A. Lumber:

1. Air- or kiln-dry to maximum 19 percent moisture content, prior to installation. Lumber must be 19 percent moisture content prior to close-in and finish.
2. Furnish S4S unless otherwise noted.
3. Size to conform with rules of governing standard. Sizes shown are nominal unless otherwise noted.

2.03 SOURCE QUALITY CONTROL

A. Grade Mark each piece of lumber. Marking must be done by recognized agency. Lumber Manufacturer's Association Certificates may be accepted in lieu of such grade and trademarks.

1. Douglas Fir shall bear WCLIB grade stamp.

B. Plywood Sheathing: Each panel shall be legibly identified as to type, grade, and specie by APA grade. If plies are spliced, the slope of the scarf shall not be steeper than 1:8. White pockets will not be permitted in face plies.

C. Each piece of preservative treated lumber shall bear AWPA stamp.

2.04 WOOD PRESERVATIVE TREATMENT

A. Preservative treatment: Comply with applicable requirements of AWPA standards C2 for lumber and C9 for plywood. After treatment, kiln dry lumber to a maximum moisture content of 19 percent, and plywood to 15 percent.

1. Pressure treat members connected with roofing, flashing and weatherproofing; including but not limited to cants, nailers, curbs, equipment supports and blocking.

2. Pressure treat members that are concealed and in contact with masonry or concrete, including, but not limited to, sills, nailers, blocking, furring and studs.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection:

1. Prior to all work of this Section, carefully inspect the installed work of all other trades, and verify that all such work is complete to the point where this installation may properly proceed.
2. Verify that rough carpentry may be performed in strict accordance with the original design and all pertinent codes and regulations.

B. Selection of Lumber Pieces: Carefully select all members. Select individual pieces so that knot and obvious defects will not interfere with placing bolts or proper nailing or making proper connections. Cut out and discard all defects which will render a piece unable to serve its intended function.

C. Lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting. No load carrying member shall be exposed to earthen materials.

D. Shimming: Do not shim any framing component.

3.02 FASTENING

A. Nailing: Except as otherwise indicated on Drawings or specified, all nailing shall be as scheduled on Drawings:

1. Nails or Spikes shall be common wire unless noted otherwise. Penetration of nails or spikes shall be one-half the length of the nail or spike into the piece receiving the point. However, to connect pieces 2 inches in thickness, 16d nails shall be used unless noted otherwise.
   a. Bore holes for nails wherever necessary to prevent splitting.
   b. Use finish or casing nails for finish work.
   c. Use of nailing guns is as limited by CBC and must be approved by Architect and DSA. Submittal of guns and nails is required.

B. Bolts: Bolts shall be of sizes indicated. Drive fit with washers under nuts. Tighten all bolts and screws before closing in.

C. Framing Devices: As specified under Products, sizes as indicated. Use half-length nails where required.

D. Lag Screws: Pre-Bore lead holes and install per NDS, current edition.

3.03 FRAMING AND ROUGH CARPENTRY

A. Sills: Shall be in long lengths of sizes shown, fastened with anchor bolts at exterior walls and with powder driven fasteners at interior walls as indicated, a minimum of two (2) fasteners per piece and a bolt within 9" but not nearer than 6" from end of piece. Place malleable iron or steel plate washers (but not cut washers) under nuts bearing on wood. Set sills level and true and bed exterior wall sills and interior bearing wall sills on 1/2 inch dry-pack or non-shrink grout.

B. Studs, Posts and Columns: Shall be full length. Corners shall be as detailed. Partitions or walls containing plumbing, heating or other piping shall be so formed as to give proper clearance for materials. Cut members as required to provide full bearing at ends. Connect to structure as indicated.

C. Plates: Shall be in long lengths and spliced as shown.

D. Blocking: Shall be same thickness and width of studs or joists unless shown otherwise. Blocking shall not be spaced over 8'-0" o.c. Install fire blocking in accordance with CBC, Section 717. Install

blocking at all plywood joints unless otherwise noted on the drawings. Install blocking for fastening all surface applied items.

E. Joists and Beams: Shall be in long lengths and spliced over bearings unless shown otherwise. Install with crown side up. Beams or headers indicated to be built up of two or more joists shall be fabricated on the job using full length members. For two-piece members, stitch nail pieces together with 16d common nails spaced not over 12" o.c. and staggered. Clinch nails protruding through members.

1. Provide double joists and headers at all openings through floors and roofs unless otherwise shown on Drawings.
2. Provide typical headers at all openings through walls where one or more studs are required to be cut. For penetration through walls narrower than stud spacing, provide solid backing on all sides for fastening finish materials.

F. Plywood Structural Sheathing: Install to pattern indicated and provide blocking at joints where noted on the drawings. Center all joints overbearing supports. Nail to framing as indicated. Install plywood with face plies perpendicular to joists or studs unless indicated otherwise.

G. Wood Furring, Stripping and Grounds: Install as shown or required to provide nailing of materials or passage of pipes, conduits, etc., not otherwise accommodated.

H. Bridging: Space not over 8'-0" o.c. for spans over 16'-0". Spans over 8'-0" and under 16'-0" shall have bridging placed at midspan. Bridging shall be two 2 x 3's or solid blocking as indicated. Joists 8" or less in depth shall not require bridging unless specifically indicated.

I. Backing: Shall be provided for all wall and ceiling finishes and for supporting of fixtures and equipment for all trades, including toilet partitions, toilet room accessories, frames, case work, mirrors, trim, applied wall finishes, etc. Coordinate placement of backing and supports with manufacturer or supplier of mounted items.

J. Building Paper: Install two layers in all exterior locations. Install with weather lap edges a minimum of 2 inch horizontal and 6-inch vertical laps. Continue building paper minimum 6 inches around inside and outside corners. Fasten in place with appropriate staples.

K. Cuts or holes in preservative treated wood shall be treated in accordance with AWPB standard M4 in the field.

3.04 MISCELLANEOUS HARDWARE

A. Finish hardware is specified in Section 08 71 00. All other hardware indicated or required but not specified elsewhere shall be furnished and installed hereunder, including appropriate screws or other fastening devices.

3.05 MISCELLANEOUS CARPENTRY WORK

A. Miscellaneous Carpentry Work not included under other sections shall be furnished and installed hereunder as indicated. Carefully locate and securely anchor such items to structure.

B. Drypack: Drypack shall consist of 1 part high early strength Portland cement to not more than 3 parts of sand by volume. Add only a minimum amount of water to hold the mixture in shape while packing and to provide hydration. Solidly ram drypack into place to provide uniform bearing and cure with moist sacks or cloths for a period of at least three (3) days.

C. Plywood Backing for electrical, telephone, and similar types of wall mounted equipment shall be provided hereunder where required. Plywood shall be 3/4" thick exterior A-C plywood with 'A' face exposed.

D. Shoring and Bracing: Shore or brace for temporary support of all work as required during the construction period except any shoring and bracing specified and included under other sections of these specifications.

E. Temporary Enclosures: Provide and maintain all barricades and enclosures required to protect the work in progress.

F. Protect all work in progress and all work installed, as well as the work of all other trades. Any work damaged as a result of the work under this section shall be corrected to its original condition or replaced if directed by the Architect and at no increase in cost to the Owner.

G. Protection Devices: Pedestrian walkways, barricades, lights, shoring and other protective structures and devices necessary for the protection of pedestrians shall conform in all respects to the requirements of CBC, Section 3303, Title 24 and to the requirements of the Department of Public Works.

3.06 FRAMING TOLERANCES

A. Maximum variation from true flatness: 1/4 inch in ten feet in any direction.

3.07 CLEAN-UP

A. Upon completion of the work of this Section, remove all surplus materials, rubbish, and debris from the premises.

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

Please delete this page prior to issuance.

- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-01-31 – Minor revisions. Added door thickness info.
- 2025-11-11 Updated from CBC 2022 and CDC 2025 as applicable

DISTRICT DESIGN STANDARDS

Notice to All Users and Designers!

In many cases, the District does not govern the technical 3-part specifications for the Design Team. The design standards information shown below is provided to convey the District's intentions on manufacturers, products and procedures that the District does or does not want to be used on their projects. The items listed below are to assist you with understanding what needs to be reflected in your 3-part specification without forcing a pre-written specification upon you. Where a 3-part specification section is provided by the District, the items below are design parameters to be considered when applying this specification section to your design. The design team shall confirm and coordinate all product and system requirements with the District during design regardless of them being design standards or full 3-part specifications.

When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

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All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- Additional countertop and casework surfacing materials not specified herein can be recommended by the Designer on a project-by-project basis.
- Do not select obscure laminates that cannot be matched in the future or are not readily available.

SECTION 06 41 00

ARCHITECTURAL CASEWORK

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Special fabricated cabinet units.
2. Countertops.
3. Preparation for utilities.
4. Cabinet hardware.

B. Related Sections:

1. A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. 06 10 00 - Rough Carpentry.
3. 09 65 00 - Resilient Flooring.
4. 09 65 16 - Resilient Flooring.
5. 09 68 13 - Carpeting.

1.02 REFERENCES

A. North American Architectural Woodwork Standards (NAAWS).

B. ASTM A653-25 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

C. ASTM A924-22a - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

D. ASTM C615-23 - Standard Specification for Granite Dimension Stone.

E. ASTM E84-24 – Standard Test Method for Surface Burning Characteristics of Building Materials.

F. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.

1.03 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01 33 00.

B. Include materials, component profiles, fastening methods, assembly methods, joint details, accessory listings, and schedule of finishes. Provide WI Certified Compliance label on first page of

each set. Shop drawings will be rejected until reviewed by the assigned Woodwork Institute inspector and label has been issued.

C. Product Data: Manufacture literature for all hardware to be provided.

D. Samples:

1. Finishes for color selection.

2. Hardware: drawer pulls, hinges, locks and other hardware accessories.

3. Identification tag and fasteners.

4. Submit two physical samples and product data sheets of drawer pulls, hinges, locks, ID tags, and other specified hardware accessories, illustrating hardware type and finish.

1.04 QUALITY ASSURANCE

A. Manufacture casework items in accordance with quality standards of the NAAWS.

B. All millwork and the installation of millwork shall be monitored for compliance under the scope of the WI Certified Compliance Program (CCP).

C. Provide WI Inspection Service at the millwork fabricator. Provide to Architect a written report showing the results of the inspection.

D. Issue WI Certified Compliance Certificate to Architect prior to delivery of millwork and provide WI Certified Compliance Labels on all items of casework and countertops.

E. Provide WI Reinspection Service at the job site prior to installation. Provide to Architect a written report showing the results of the reinspection.

F. Self-Certification by the millwork fabricator or inspection by other than an authorized representative of The Woodwork Institute is not acceptable.

G. Upon completion of the installation, provide a WI Certified Compliance Certificate.

H. Regulatory Requirements

1. Conform to CBC requirements for flame spread classification.
2. Conform to Flame Spread Classifications of Interior Millwork contained within the Appendix of the NAAWS for flame spread ratings as tested according to ASTM E84-24.

I. Mockup

1. Prepare mockup under provisions of Section 01 33 00.

2. Provide full size base cabinet and upper cabinet of each type indicated, in specified finish with hardware installed.
3. Units will be examined to ascertain quality and conformity to NAAWS.
4. Units will establish a minimum standard of quality for this work.
5. Approved units may be used as part of the Work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage, and deter their erection from damage of any character. Work damages through neglect or failure to provide protection shall be made good by the contractor and without additional cost to the Owner.

1.06 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on shop drawings.

B. Field verify existing finish floor conditions to ensure specified finish countertop heights and knee space clearances at accessible stations are maintained. If shimming is required to level units, this shall be taken into account in base cabinet construction.

1.07 COORDINATION

A. Coordinate the work with electrical rough-in, to assure orderly and efficient sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. See schedule of manufacturers, patterns, and colors.

B. Active member of the Woodwork Institute licensed by WI to provide WI Certified Compliance Certificates and Labels for the products and materials specified in this section www.woodworkinstitute.com.

C. Substitutions: Under provisions of Section 01 25 13.

2.02 MATERIALS

A. Individual cabinets are indicated on the drawings by the NAAWS Appendix Cabinet Design Series (CDS) numbering system.

B. Wood materials shall be Forest Stewardship Council (FSC) certified.

C. Composite wood shall be free of added urea formaldehyde.

D. Modular Casework - Laminated Plastic Covered

1. Fabricate in accordance with Section 10 of the NAAWS:

   a. NAAWS Grade: Custom
   b. Type: Type 1
   c. Construction: Style A-Frameless
   d. Joinery: Frameless
   e. Cabinet Backs: Dadoed (Detail 2C and 78 of Millwork Man.) Type A. Type B for glass
   f. Cabinet Door Type: Type A. Type B for glass
   g. Cabinet Door Thk.: 3/4 inch.
   h. Shelves:
      All shelving less than 25" to be 3/4-inch-thick melamine covered Industrial Board.
      All shelves between 25" to 34" to be 1" inch thick melamine covered Industrial Board.
      All shelves between 34" to 46" to be 3/4" inch thick HPL covered Veneer Core DF Plywood.
      All shelves over 46" to be 1" inch thick HPL covered Veneer Core DF Plywood.
   i. Shelf Edge Bands:
      1mm PVC in color to match shelf at three concealed sides. 3mm PVC at exposed leading edge.
   j. Door and Drawer Edge Bands:
      3 mm PVC radiused 1/8 inch at edge. Solid color as selected by Architect.
   k. Exposed Surfaces (including shelves and interior of open front cabinets):
      .045-inch thick high pressure plastic laminate.
   l. Semi-Exposed Surfaces (behind doors and inside drawers):
      Low pressure decorative polyester or melamine laminate ALA-85.
   m. Security and Dust Panels: Particle board, 3/4 inch thick at all lockable drawers.

E. Countertops - Laminated Plastic

1. Fabricate in accordance with Section 11 of the NAAWS:
   a. NAAWS Grade: Premium
   b. Core Thickness: .075 inch minimum
   c. Laminate Thickness: 1.50 inch or .042 inch for postformed use
   d. Edge Covering: --
   e. Backsplash: Square butt
   f. Top of Back Splash: Square self-edge
   g. Colors and Pattern: To be selected by Designer

G. Hardware

Commented [JR1]: Yet to review

1. Finish: Satin Aluminum.
2. Shelf Standards: Knape and Vogt 255ZC (bright zinc plated).
3. Shelf Supports: Knape and Vogt 256ZC (bright zinc plated).
4. Shelf Fastener Supports: Knape and Vogt 243ZC (bright zinc plated) 2 each shelf.
5. Shelf Supports: Hettich "Sekura" or approved equal all metal construction with 80 lb load rating. Retention pins only required at front shelf support clips. Rear clips may be non-retention pin type. Clips set in drilled holes spaced 32 mm on center.

6. Drawer and Door Pulls: 5 inch Epco 'U-shaped' wire pulls, Hafele, or approved equal. Pulls shall comply with CCR Section 11178.6(4) and 11258.4.
7. Cabinet Locks: National Lock C8123, Corbin 0737, K and V 986, or equal. Install on all cases unless otherwise noted.
8. Drawer Slides for Drawers 24 inch Wide or Less: Accuride 7432.
9. Drawer Slides for Drawers over 24 inch wide: Accuride 3640.
10. Drawer slides for File Drawers: Grant No. 329 heavy duty ball bearing full extension slides with 100 lbs. capacity at large flat file drawers use Accuride No. 3640, 200 lbs., full extension, ball bearing, rail mount slides.
11. Hinges: Rockford Process Control, No. 851, heavy duty wrap-around, tight pin butts of steel, 2-3/4-inch minimum width with companion magnetic door catch capable of a minimum 10-pound pull capacity. Hinges per leaf: 3 feet 0-inch-high doors – two (2) hinges, 3 feet 0 inch to 5 feet 0-inch-high doors – three (3) hinges, 5 feet 0 inch to 7 feet 4-inch-high doors – four (4) hinges, 7 feet 0 inch to 8 feet 0 inch – five (5) hinges.
12. Magnetic Door Catch: Ives 326, or Hafele 246.43 .758.
13. Sliding Door Track Assemblies: Grant 2023N sheaves and Grant 2011 track.
14. Grommets: Hafele No. 429.99.128, 3-inch diameter or as noted on drawings.
15. Seismic Shelf Lip: 1/4 inch thick by 3-inch-high acrylic plastic or PVC edging of color selected by Architect. Ease all edges of plastic.
16. Remainder of hardware required shall be as listed in the Hardware Supplement to Sections 14 and 15 of the Manual of Millwork.
17. Substitutions: Under the provisions of Section 01 25 13.

2.08 FABRICATION

A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

C. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal contact surfaces of cut edges.

D. Provide all supports and required inserts for laboratory type sink units.

E. Install plastic grommets in the field in plastic laminate casework and Owner furnished furniture as directed by the Owner's Representative and/or Architect.

F. Install seismic shelf lips on all exposed edges of open laboratory shelving with flathead countersunk wood screws spaced 6 inches on center. Finish exposed screw heads to match color of shelf lip.

G. Install one (1) adjustable shelf for each 1 foot 0 inch of height for all wall mounted cabinets.

H. Provide stretcher at top face of all door and drawer fronts.

I. Provide locks on all doors and drawers.

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Set and secure casework in place rigid, plumb, and level.

B. Install casework in accordance with Section 10 and the Appendix of the NAAWS.

3.03 ADJUSTING AND CLEANING

A. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.

B. Clean casework, counters, shelves, hardware, fittings and fixtures.

3.04 SCHEDULE

FINISH INDICATOR	MANUFACTURER	PATTERN	COLOR	REF #	FINISH	LOCATION
PL-1	x	-	x	x	x	x
PL-2	x	-	x	x	x	x

END OF SECTION

SECTION 07 01 50.72

REHABILITATION OF BUILT-UP ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Roof rehabilitation and coating preparation.

2. Application of coatings on built-up asphalt roofing.

1.2 MATERIALS OWNERSHIP

A. Demolished materials shall become Contractor's property and shall be removed from Project site.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.

B. Existing Roofing System: Built-up asphalt roofing, and components and accessories between deck and roofing membrane.

C. Roofing Coating Preparation: Existing roofing that is to remain and be prepared to accept restorative coating application.

D. Existing to Remain: Existing items of construction that are not indicated to be removed.

E. Manufacturer: Manufacturer of roofing rehabilitation products, unless otherwise indicated.

1.4 ROOFING CONFERENCES

A. Roofing Rehabilitation Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to roofing system.

1. Meet with Owner; Architect; roofing re-coating materials manufacturer's representative; roofing re-coating Installer including project manager and foreman; and installers whose work interfaces with or affects re-coating including installers of roof accessories and roof-mounted equipment requiring removal and replacement as part of the Work.

2. Review methods and procedures related to re-coating preparation, including rehabilitation roofing system manufacturer's written instructions.

3. Review drawings and specifications.

4. Procedures for salvaging and recycling of demolition and construction waste

5. Review temporary protection requirements for existing roofing system that is to remain, during and after installation.

6. Review roof drainage during each stage of coating application and review roof drain plugging and plug removal procedures.
7. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
8. Review base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that will affect coating.
9. Review HVAC shutdown and sealing of air intakes.
10. Review shutdown of fire-suppression, -protection, and -alarm and -detection systems.
11. Review governing regulations and requirements for insurance and certificates if applicable.
12. Review procedures for asbestos removal or unexpected discovery of asbestos-containing materials.
13. Review existing conditions that may require notification of Owner before proceeding.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product specified.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.
   1. Letter written for this Project indicating manufacturer approval of Installer to apply specified products and provide specified warranty.

B. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
   1. Indicate that proposed system components are compatible.

C. Manufacturer' s Certificate: Provide manufacturer's UL listing certificate for roofing system.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: To include in maintenance manuals.

B. Warranties: Executed copies of approved warranty forms.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and the following:
   1. Qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.

B. Manufacturer Qualifications: Primary product manufacturer that is UL listed for roofing system identical to that used for this Project with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be the following:

1. An authorized full-time technical employee of the manufacturer.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with rehabilitation work only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.

1. Store all materials prior to application at temperatures recommended by manufacturer.

2. Apply coatings within range of ambient and substrate temperatures recommended by manufacturer.

3. Do not apply roofing in snow, rain, fog, or mist.

B. Protect building to be rehabilitated, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from rehabilitation operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

D. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

E. Owner will occupy portions of building immediately below re-coating area. Conduct re-coating so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

1.10 WARRANTY

A. Manufacturer's Warranty: Roof System Manufacturer's standard form in which Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within warranty period, as follows.

1. Form of Warranty: Manufacturer's standard warranty form.

2. Scope of Warranty: Work of this Section and including sheet metal details and termination details installed by the roof system Installer and approved by the Roof System Manufacturer.

3. Warranty Period: 10 year Material Only.

B. Manufacturer Inspection Services: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections is included in the Contract Sum.

1. Inspections to occur in following years: 2, 5 and 10 following completion.

C. Installer Warranty: Installer's warranty signed by Installer, as follows.

1. Form of Warranty: Form acceptable to Roofing Manufacturer and Owner.

2. Scope of Warranty: Work of this Section.

3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer/Product:

1. Tremco, Inc. (specified)

2. Or approved equal.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Rehabilitated roofing shall withstand exposure to weather without failure or leaks due to defective manufacture or installation.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Exterior Fire-Test Exposure: Roofing system exterior fire-test exposure performance following application of rehabilitation coating shall be not be less than that of the pre-rehabilitated roof performance when tested in accordance with ASTM E108, based upon manufacturer's tests of identical applications.

D. Energy Performance: Provide roof coating with initial solar reflectance index not less than 78 when calculated according to ASTM E1980, based upon testing of identical products by a qualified testing agency.

2.3 MATERIALS, GENERAL

A. General: Roof rehabilitation coating materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system.

2.4 ACRYLIC TOP COATINGS

A. Acrylic Roof Coating, Highly-Reflective Elastomeric: high-solids acrylic latex elastomeric roof coating formulated for use on bituminous roof surfaces; water-based, Energy Star qualified, CRRC listed and California Title 24 Energy Code compliant.

1. Basis of design product: Tremco, ICE Coating.

2. Volatile Organic Compounds (VOC), ASTM D3960: 39 g/L.
3. Emissivity, minimum, ASTM C1370: 0.83.
4. Solar Reflectance Index (SRI), ASTM E1980: 103 (initial) 75 (3 year aged).
5. Reflectance, minimum, ASTM C1549: 84 percent.
6. Solids, by volume, ASTM D5201: 65 percent.
7. Minimum Thickness: 45 mils (1.1 mm) dry film thickness .

B. Primer for Acrylic Coatings: Acrylic polymer primer to promote adhesion of acrylic emulsion coatings on single-ply membranes.

1. Basis of design product: Tremco, Tremco SP Primer.
2. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 80 g/L.
3. Solids, by Volume, ASTM D5201: 30 percent.
4. Color: White dries clear.
5. Nonvolatile content ASTM D1644: 32 percent (by weight).

2.5 AUXILIARY MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with existing roofing system.

B. Seam Sealer: Waterproof seam and patching material compatible with applied coating.

1. Seam Sealer and Patching Sealer: Acrylic elastomeric sealer, single-component, high solids, low-VOC, formulated for compatibility and use with specified roofing and wall substrates.
    a. Basis of design product: Tremco, SOLARGARD Acrylic Sealer.
    b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 50 g/L.
    c. Tensile Strength, minimum, ASTM D412: 450 psi (3100 kPa).
    d. Hardness, Shore A: 45.
    e. Elongation, minimum, ASTM D412: 300 percent.
    f. Impact Resistance, minimum: 160 in/lb (18 kN/m).

C. Reinforcing Fabric:

1. Polyester Reinforcing Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings.
    a. Basis of design product: Tremco, Permafab.
    b. Tensile Strength, Minimum, ASTM D5034 (2-inch): MD - 110 lbs (49.8 kg); XMD - 60 lbs (27.2 kg) avg.
    c. Elongation, Minimum, ASTM D5034 (1-inch): MD - 25 percent; XMD - 100 percent.

d. Tear Strength, Minimum, ASTM D5587: MD - 20 lbs (9.0 kg) avg; XMD - 20 lbs (9.0 kg) avg.

e. Weight: 3 oz./sq. yd (102 g/sq. m).

D. Joint Sealant: Elastomeric joint sealant recommended in writing by joint sealant manufacturer as compatible with applied coating and project substrates, with movement capability appropriate for application.

1. Joint Sealant, Polyurethane: ASTM C920, Type S, Grade NS, Class 50 single-component moisture curing sealant, formulated for compatibility and use in dynamic and static joints; paintable.

a. Basis of design product: Tremco, TremSEAL Pro.

b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 40 g/L.

c. Hardness, Shore A, ASTM C661: 40.

d. Adhesion to Concrete, ASTM C794: 35 pli.

e. Tensile Strength, ASTM D412: 350 psi (2410 kPa).

f. Color: White.

E. Metal Flashing Sheet: Provide metal flashing sheet matching type, thickness, finish, and profile of existing metal flashing and trim.

F. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect existing roofing system that is indicated not to be rehabilitated, and adjacent portions of building and building equipment.

1. Mask surfaces to be protected. Seal joints subject to infiltration by coating materials.

2. Limit traffic and material storage to areas of existing roofing membrane that have been protected.

3. Maintain temporary protection and leave in place until replacement roofing has been completed.

B. Pollution Control: Comply with environmental regulations of authorities having jurisdiction. Limit spread of dust and debris.

1. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

2. Remove debris from building roof by chute, hoist, or other device that will convey debris to grade

C. Shut down air intake equipment in the vicinity of the Work in coordination with the Owner. Cover air intake louvers before proceeding with re-coating work that could affect indoor air quality or activate smoke detectors in the ductwork.

1. Verify that rooftop utilities and service piping affected by the Work have been shut off before commencing Work.

D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

1. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

3.2 ROOFING COATING PREPARATION

A. Existing Flashing and Detail Preparation: Repair flashings, gravel stops, copings, and other roof-related sheet metal and trim elements. Reseal joints, replace loose or missing fasteners, and replace components where required to leave in a watertight condition.

1. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish.

B. Membrane Surface Preparation:

1. Substrate Cleaning: Clean substrate of contaminants such as dirt, debris, oil, and grease that can affect adhesion of coating by power washing at minimum 2,000 psi.

2. Verify that existing substrate is dry before proceeding with application of coating. Spot check substrates with an electrical capacitance moisture-detection meter.

3. Remove blisters, rides, buckles, protruding fastener buttons, and other substrate irregularities from existing membrane that would inhibit application of uniform waterproof coating.

4. Verify adhesion of new products.

C. Surface Priming: Prime surfaces to receive fluid-applied coating using coating manufacturer's recommended product for surface material. Apply at application rate recommended by manufacturer.

1. Ensure primer does not puddle and substrate has complete coverage.

2. Allow to cure completely prior to application of coating.

D. Membrane Repair: Repair membrane at locations with irregularities using seam sealer mastic and reinforcing fabric.

3.3 ROOF COATING APPLICATION

A. Coating, Acrylic Emulsion: Once seam sealer mastic and primer-surfacer have adequately cured, apply coating in number of coats and thickness of application recommended in writing by manufacturer for application.

B. Apply minimum of two coats. Allow to cure between coats.

C. Apply at 2 gallons per square per coat. Backroll all coating applications to ensure clean finish with no spray lines and fully bonded coating.

3.4 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period.

B. Correct deficiencies in or remove coating that does not comply with requirements, repair substrates, and reapply coating.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

Please delete this page prior to issuance.

- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-11-11 – Updated from CBC 202 to CBC 2025 as applicable

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DISTRICT DESIGN STANDARDS

Notice to All Users and Designers!

In many cases, the District does not govern the technical 3-part specifications for the Design Team. The design standards information shown below is provided to convey the District's intentions on manufacturers, products and procedures that the District does or does not want to be used on their projects. The items listed below are to assist you with understanding what needs to be reflected in your 3-part specification without forcing a pre-written specification upon you. Where a 3-part specification section is provided by the District, the items below are design parameters to be considered when applying this specification section to your design. The design team shall confirm and coordinate all product and system requirements with the District during design regardless of them being design standards or full 3-part specifications.

When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

Please delete this page prior to issuance.

All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- Insulation is a very project specific material that can and will be used in a myriad of different applications, thicknesses, rated and non-rated conditions. Therefore, designer shall provide necessary products to complete the design.
- Interior acoustic wall treatment as required to meet NRC and STC ratings.
- All exterior walls to be filled full depth of wall cavity or as required to meet Title 24.
- Where used, exposed insulation shall be held in place with a paintable sheet membrane.

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- None at this time.

SECTION 07 26 00

VAPOR RETARDERS

PART 1 – GENERAL

1.01 SUMMARY

A. SECTION INCLUDES

1. Concrete Vapor Emission Control System for remediation of excessive slab moisture and / or alkyd levels.
2. Repairs and preparation of concrete substrate and to install the concrete vapor emission control system.
3. Subfloor testing after concrete treatment.

B. RELATED SECTIONS

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Bid Form: Bid Allowance with Unit Cost for potential slab treatment.
3. Section 00 72 00: General Conditions.
4. Section 00 72 00: Exhibit C: Abatement of Hazardous Materials.
5. Section 33 13 13: Concrete Work: Subfloor surface.
6. Section 06 10 00: Rough Carpentry: Subfloor surface.
7. Section 09 65 00: Resilient Flooring.
8. Section 09 65 43: Linoleum Floor Coverings.
9. Section 09 96 56: Epoxy Flooring and Base System.
10. Section 09 68 00: Carpet.

C. REFERENCES

1. ASTM C920-148 – Elastomeric Joint Sealants.
2. ASTM E96~~ / E96M~~-24a~~16~~ – Test Method for Water Vapor Transmission of Materials.
3. ASTM F710-2211-Practice for Prepping Concrete Floors to Receive Resilient Flooring.
4. ASTM F1869-2316 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
5. ASTM F2170-~~16~~ 19a - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

1.02 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Ten-year experience in producing moisture vapor control emission products.

2. Minimum $5-million product liability insurance policy from an A-rated carrier.

3. A warranty program covering coats associated with repair or replacement of concrete vapor emission control system and finish floor covering or coating, including repair or replacement labor.

B. Installer Qualifications:

1. Installer shall have experience in the installation of floor covering or floor coatings and shall have experience in the installation of concrete vapor emission control systems.
2. Floor covering installer must be factory trained and certified for the installation of the specific products being installed.
3. Installer to provide project inspector proof of certification prior to starting work.
4. Certified installer must be present on job site while work is in progress.

C. Testing Laboratory Qualifications:

1. Certified, bonded, qualified and experienced agency to perform pH and moisture vapor emission tests.

D. Pre-installation Meeting:

1. Contactor to notify Construction Manager with a minimum of 5-days' notice when anticipated to be ready for pre-installation meeting.
2. Contractor, installer and manufacturer representative are required to attend pre-installation meeting. Contractor is responsible for coordinating and scheduling their attendance.
3. Construction Manager will schedule meeting with Contractor team, Project Inspector, and Architect.
4. Purpose of Meeting: To review subfloor condition and test results; determination of appropriate treatment system(s) and location(s); and review installation requirements.

1.03 SUBMITTALS

A. Provide a complete submittal package with all components required within this section. Submit per Section 00 72 00.

1. Product Data: Provide product data describing physical and performance characteristics, material safety data sheets, certificates, warranty information and manufacture's installation instructions for proposed product.
2. Submit product manufacturer's field reports and test reports with warranty certification.
3. Submit anhydrous calcium chloride testing according to ASTM F1869-23 and RH Probe Tests results according to ASTM F2170-19a. Submit substrate pH readings. Tests shall be performed by the Owner's Inspector and results provided to the Architect, Owner, General Contractor, flooring installer and Water Vapor Reduction System Manufacturer's Representative.

1.04 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Store products in an approved ventilated dry area; protect from dampness, freezing, and direct sun light. Product should not be stored in areas with temperatures in excess of 90 °F or below 50 °F.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Areas to receive Vapor Emission Control System shall be clean, fully enclosed, weather tight with the permanent HVAC set at a uniform temperature per manufacturer's recommendation.

B. Maintain ambient temperature required by manufacturer three days prior to, during, and 24 hours after installation of Vapor Emission Control System.

C. Do not apply moisture vapor reduction system to unprotected surfaces or when water is accumulated on the surface of the concrete.

D. Do not apply water vapor reduction system when temperature is lower than 50° F or expected to fall below this temperature within 24 hours from time of application.

E. Protection: Protect water vapor reduction system to prevent damage from topical water for a minimum period of 24 hours from time of application.

1.06 WARRANTY

A. Contractor shall file a pre-installation checklist with the manufacturer (as required) and receive written confirmation of the approval to proceed in order to obtain full warranty.

B. Emission control system warranty must be from the manufacturer, in writing, and cover the cost of system materials, cementitious compounds and labor costs of application and preparation. In addition, the warranty must extend to the flooring material, adhesive and installation labor.

C. Warranty period shall be no less than ten years or the life of the flooring covering whichever comes first.

D. Warranty exclusion shall be limited to:

1. Moisture failure due to topical intrusion of plumbing failure or other substances entering from the surfaces.
2. Seismic damage occurring after installation.
3. Replacement of flooring during warranty period as removal of flooring could damage emission control system.

4. Aggregate found to be defective (expansive and reactive aggregate are examples).

E. Warranty shall not exclude cracks visible at time of installation nor “improper installation”.

F. Manufacturer to provide evidence of a product liability insurance policy. Insurer shall have no less than an “A” rating from one of the four major rating services. A certificate of insurance shall be delivered to the Owner and shall name the Owner, Architect and General contractor as co-insured. Liability shall be in the amount of $5 million per occurrence.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Vapor Emission Control System: The appropriate system(s) shall depend on the existing slab moisture and pH levels and the requirements of the specific floor covering product. The determination of which of the following systems would be most appropriate and the extent of treatment area(s) shall be made by the Owner’s representative once the existing slab testing results are known.

1. Koester VAP1 2000 System. 100% solids epoxy.
2. Mapei Planiseal VS System. An alkali-resistant, two-component, 100%-solids epoxy coating that effectively stops moisture-related problems with floor coverings.
3. ARDEX MC™ RAPID.100% solids epoxy system.

2.02 MIX DESIGNS

A. VAP1 2000:

1. Use clean containers and mix thoroughly as per Manufacturer's requirements to obtain a homogeneous mixture. Use a low-speed motor less than 400 rpm and a two bladed Jiffy mixing blade only. DO NOT AERATE. Mix ratios are measured by volume.
2. VAP I® 2000 Mix Ratio: Mix Component A and B at a ratio of 2.4:1 by volume.

B. Mapai Planiseal VS:

1. Premix Part A to a homogenous consistency (2 to 3 minutes) using a low-speed mixer (at 300 to 450 rpm) and a “jiffy” (paint mixer) mixing paddle.
2. Pour Part B into Part A container and mix thoroughly to a smooth, homogenous consistency. Do not mix at high speeds, which can trap air within the mixed material.
3. Pour and spread the entire unit of any mixed Planiseal VS onto the substrate within 5 minutes of mixing.

C. ARDEX MC PLUS:

1. Each individual unit of ARDEX MC RAPID™ Red and ARDEX MC RAPID™ Green contains separate, pre-measured quantities of the hardener (Part A) and the resin (Part B). The hardening agent (Part A) is added to the resin (Part B).
2. ARDEX MRP and/or ARDEX K 301 are mixed in 2-bag batches at one time. Mix each bag of powder with the prescribed amount of water using an ARDEX Mixing Paddle and a 1/2" heavy-duty drill (min. 650 rpm). Mix thoroughly for approximately 2-3 minutes to obtain a lump-free mixture. Follow written installation instructions for each material.
3. For mix designs related to the use of ARDEX underlayment's and toppings, refer to the standard mixing instructions for installation over concrete as shown in the manufacturer's installation instructions.
4. For instructions on the filling of dormant cracks and joints, follow the written instructions of the selected epoxy manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Calcium Chloride, RH Probe and pH test requirements:

1. Anhydrous calcium chloride testing shall be performed by the Owner's Inspector.
2. Provide anhydrous calcium chloride tests according to ASTM F1869-23 protocol.
3. Provide RH Probe Tests according to ASTM F2170-19a protocol.
4. Only conduct calcium chloride tests at the same temperature and humidity expected during normal use. If this is not possible then follow the F1869 method for non-acclimated spaces. Maintain these conditions 48 hours prior to and during tests. Water vapor transmission levels are directly affected by ambient room temperature and readings conducted without a sustained ambient temperature and humidity are NOT acceptable.
5. Provide substrate surface pH readings.
6. Owner's Inspector shall provide test results with a marked-up floor finish plan showing test result. Inspector shall provide a written clarification on status of the ambient air temperature and humidity before and during the testing procedures.

B. Concrete Slab Inspection

1. Existing concrete slabs - Testing for concrete deficiencies and contaminates such as un-reacted silicates, chlorides, A.S.R. (alkali-silica reaction), oil contamination, etc. is recommended by Koster to avoid bonding issues. These conditions can cause bonding concerns with all epoxy and finished floor coatings, including the Koster VAP 1 2000. This testing is not required by Koster. This testing should be performed by the owner's independent testing agency using utilizing standard coring methods and review of the history of the slab installation if available. Concrete should conform to ACI Committee 201 Report "Guide to Durable Concrete."
2. New concrete slabs - Review Section 03 30 00 curing compounds. Silicate based curing compounds should be avoided.

3.02 PREPARATION

A. Inspect all surfaces with regard to their suitability to receive moisture vapor reduction system with manufacturer's representative.

B. Clean all surfaces to receive moisture vapor reduction system. Shot blast all floors to a CPS #3 or #4 and clean surfaces with vacuum and remove all residue off the concrete. Grinding is allowed only in areas not accessible by shot blasting. Do not acid etch. Remove ALL defective materials, and foreign matter such as dust, adhesives, gypsum based patching and leveling compounds, paint, dirt, un-reacted sprayed on silicates, floor hardeners, bond breakers, oil, grease, curing agents, form release agents, efflorescence, laitance, shot blast bee bees, etc. Repair all cracks, expansion joint, control joints, and open surface honeycombs and fill in accordance with Manufacturers recommendations. Inform vapor reduction system manufacturer if concrete additives like silicates or chlorides or any other soluble compounds that have been used in the concrete mix or topically applied. Reinforcing fibers that are visible after shot blasting must be removed and vacuumed leaving no fibers left on the concrete surfaces. Provide uncontaminated, sound surface.

C. Repair concrete prior to moisture vapor reduction system. Consult with vapor reduction manufacturer to determine suitable products for concrete repair.

D. Shot blast a small test area and review surface profile with the finished flooring applicator. As the moisture vapor reduction system is not a leveling material make sure the flooring installer is aware that a feather finish or leveling material may be utilized to "flatten" the concrete after the application of the moisture vapor reduction system and prior to the flooring installation.

E. Clean substrate surfaces to receive system treatment and treat surface irregularities with a 100% Portland Cement based patching compounded and cementitious fill compatible with prescribed system treatment as recommended by the manufacturer of the moisture control system.

F. At all treated locations under finish goods i.e. carpet, VCT, etc., install self-leveling material to provide a smooth and uninterrupted concrete substrate for proper installation of floor finish.

3.03 JOINT AND CRACK PREPARATION

A. VAP1 2000:

1. Fill cracks, control joints, voids and deteriorated concrete with CTS Cements Rapid Set Cement All, Mortar Mix, Concrete Mix or Skim Coat prior to the VAP I 2000 application. Allow the products to cure according to Rapid Set's requirements before applying the VAP products over the repaired area. Do not use gypsum based cementitious patching, leveling and repair mortars under the VAP I 2000 systems. Cracks should be opened up to at least 1/4" x 1/4" to allow for a proper amount of Rapid Set materials to fill the voids. Any cracks/voids that may be contaminated by known or unknown substances should be routed out to remove any contaminants.
2. Expansion joints should be repaired per the detail on the VAP I 2000 data sheets. A fumed silica epoxy thickening agent (Aerosil or Cabosil) can be added to the VAP I 2000 products and used in place of cementitious materials for control joints and cracks if needed.
3. Consult with Koster America for crack general repair guidelines.

B. Mapai Planiseal VS:

1. Repair cracks before application of the Planiseal VS using an appropriate high-modulus epoxy (Planibond EBA or Planibond CR 50) mixed with sand if required (depending on the size of crack under repair). Cracks narrower than 1/8" (3mm) may typically be filled with Planiseal VS neat. Cracks wider than 1/8" (3mm) are to be repaired with suitable high-modulus epoxy such as Planibond EBA or Planibond CR 50 (consider an epoxy mortar if appropriate) filled to 1/8" to ¼" (3 to 6mm) shy of the substrate surface (just below flush).
2. Avoid overfilling of cracks with high-modulus epoxies that will lead to epoxy spilling onto substrate. Any epoxy that spills onto the substrate surface must be removed, and any remaining residue must be fully seeded with sand. The subsequent application of the Planiseal VS must take place after all loose sand have been vacuumed up off the floor, and fully encapsulate the epoxy utilized for crack repair.
3. Contraction, control or saw-cut joint treatment – Dormant control joints may typically be filled with Planiseal VS, or with Planibond EBA or Planibond CR 50 (consider an epoxy mortar if appropriate) filled to 1/8" to ¼" (3 to 6mm) shy of the substrate surface (just below flush).

C. ARDEX MC:

1. Moving Joints – honor all expansion and isolation joints up through the ARDEX Moisture Control System, and underlayment or topping.
2. Saw cuts, control joints and dormant cracks –To ensure that a continuous barrier to moisture emissions is created over the entire surface, ARDEX recommends the use of a two-part, low viscosity rigid epoxy crack and joint filler to fill small, non-moving cracks and saw-cut joints in existing concrete substrates. Cracks greater than a hairline in width [1/32" (0.79 mm)] and saw-cuts must be filled in strict accordance with the installation instructions provided by the ARDEX Technical Department. Once the dormant cracks and saw-cuts have been properly filled, allow these areas to cure thoroughly in accordance with the epoxy manufacturer's recommendations prior to proceeding with the ARDEX MC™ RAPID installation.
3. Saw Cuts, Control Joints and Dormant Cracks – fill all non-moving joints and cracks greater than 1/32" with a rigid, low-viscosity, two-part epoxy joint sealant. Once the cracks and joints have been properly filled, broadcast a sand layer to refusal and allow these areas to cure as recommended by the epoxy manufacturer prior to proceeding with the installation of the ARDEX MC™ RAPID.

3.04 INSTALLATION (per manufacturer's guidelines or as follows)

A. The coverage rates vary by system. Follow manufacturer recommendations for the specific project application.

B. Application of moisture reduction system shall be in strict accordance with manufacturer recommended methods and installation information.

C. Cementitious underlayment with suitable primer is recommended if required by the Owner, floor covering installer, or the floor covering manufacturer to smooth and/or level surfaces after shot

blasting and installation of the moisture reduction system. No underlayment or feather finish system is allowed under the moisture reduction system material. When water-based adhesives are utilized in the floor covering installation, use an approved cementitious underlayment system with primer prior to the installation of the flooring system. Contact the adhesive manufacturer for their minimum recommended thickness of cementitious underlayment to absorb excess moisture in the adhesive. Typically, a minimum of 1/8" is required. Note this is only for some water-based adhesives.

3.05 PROTECTION

A. Prohibit any traffic or any activity that generates dust or debris from contaminating the treated slab until finished flooring is installed.

B. Do not install finished flooring until the vapor control system has fully cured in accordance with manufacturer's recommendations.

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

Please delete this page prior to issuance.

- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-11-11 Updated from CBC 2022 to CBC 2025 as applicable

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- None at this time.

SECTION 07 60 00

FLASHING AND SHEET METAL

PART 1 – GENERAL

1.01 SUMMARY

A. All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specification sections which apply to work of this section as if printed herein.

B. Section Includes:
1. Flashings, counter flashings, and copings as indicated on the Drawings and specified herein.

C. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 05 50 00 - Miscellaneous Metal.
3. Section 07 52 16 – SBS Modified Bituminous Membrane Roofing.
4. Section 07 54 19 – Polyvinyl-Chloride Roofing.
5. Section 07 71 23 – Gutters and Related Flashings.
6. Section 07 90 00 – Joint Sealants.
7. Refer to Division 7, for Roofing Sections, and Prefabricated roof curbs, hatches, roof deck insulation, and Division 8 component daylight systems.

1.02 REFERENCES

A. Fabricate sheet metal items from sheet steel in accordance with ASTM G90-23.

B. ASTM A924 ~~/ A924M-16ae1~~ 22a - General Requirements for Steel Sheet, Metallic-Coated by the Hot Dip Process.

C. FS TT-C 494B – Federal Specification for Coating Compound, Bituminous, Solvent Type, Acid Resistant.

D. SMACNA - Architectural Sheet Metal Manual, current edition.

E. AWS - American Welding Society.

1.03 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Shop Drawings: Indicate locations, configurations, jointing methods, welding methods, fastening methods, expansion joint layouts, downspout layout and installation details.

C. Samples: Submit two samples, 12 inches long illustrating component design, finish, color, and configuration.

1.04 QUALITY ASSURANCE

A. Conform to SMACNA Manual for architectural sheet metal flashing and installation details.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Where general flashing pieces are shown on drawings, provide steel sheet metal of at least 22-gauge steel unless otherwise noted on drawings.

B. Where sheet aluminum is shown on Drawings, provide 0.032-inch thickness (20-gauge) and in accordance with ASTM B209-21a, 6063-T5 in color finish as selected by Architect.

C. Extruded Aluminum: Manufacturer's standard extrusions of sizes and profiles indicated, 60063-T52, AA-C22A41 clear anodized finish; 0.080-inch minimum thickness for primary legs of extrusions.

D. Stainless Steel: AISI Type 302/304, complying with ASTM A167-99(2009), 2D annealed finish, soft, except where harder temper required for forming or performance; 0.0156-inch thick (28 gauge) except as otherwise indicated.

E. Galvanized Steel: ASTM A924 ~~/ A924M~~-09a, Grade A, G90 zinc coating.

2.02 ACCESSORIES

A. Fasteners and Clips: Provide as required and appropriate for the materials being fastened. Where fasteners or clips may be exposed to outside weather conditions, provide galvanized or stainless-steel type.

1. Provide fasteners such as bolts, screws, and nails hot-dip galvanized as specified in accordance with ASTM A153-23.

B. Where rivets will be used, provide malleable iron type with rust-inhibitive coating.

C. If drive pins are incorporated into work, provide Omark or other approved, cadmium plated with neoprene facing, at least 1-inch long, with neoprene washers.

D. Solder: For use steel or copper, provide 50 – 50 tin/lead solder (ASTM B32-20) with rosin flux.

E. Solder: For use with stainless steel, provide 60 – 40 tin/lead solder (ASTM B32-20) with acid-chloride type flux, except use rosin flux over tinned surfaces.

F. Bituminous Coating: SSPC – Paint 12, solvent-type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

G. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.

H. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Section 07 90 00 Joint Sealers.

I. Epoxy Seam Sealer: Two-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.

J. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of flashing sheet.

K. Paper Slip Sheet: 5 lbs. rosin-sized building paper.

L. Polyethylene Underlayment: Minimum 6-mil carbonated polyethylene film resistant to decay when tested in accordance with ASTM E154-08a(2025).

M. Reglets: Metal or plastic units of type and profile indicated, compatible with flashing indicated, noncorrosive.

N. Elastic Flashing Filler: Closed-cell polyethylene or other soft closed-cell material recommended by elastic flashing manufacturer as filler under flashing loops to ensure movement with minimum stress on flashing sheet.

2.03 FABRICATION

A. General Metal Fabrication:

1. Shop fabricate work to greatest extent possible. Comply with details shown and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate waterproof and weather-resistant performance with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work.
2. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed seams with epoxy seam sealer; rivet joints for additional strength where required.

B. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. For metal other than aluminum, in edges to be seamed, form seams and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.

C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently weather/waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

D. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

E. Separations: Provide for separation of metal from incompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

F. Aluminum Extrusion Units: Fabricate extruded aluminum running units with formed for extruded aluminum joint covers. Fabricate mitered and welded corner units.

2.04 PREFABRICATED SHEET METALS

A. Copings: Provide factory prefabricated 22-gauge galvanized steel sheet metal continuous snap on type copings per SMACNA Chapter 3, Figure 3-1 with EIEPGE Styles. Copings shall be maximum 10-foot lengths, secured at one (1) end and free at other end and/or per SMACNA requirements. Cover plate shall extend 6-inch minimum beyond 1/2-inch space between coping lengths. Secure cover plate with screw in neoprene washer per SMACNA Figure 3-1-Detail 1 in oversized holes. Provide copings manufactured by MM Systems Corporation, Construction Specialties, Tremco, KC Metals, Fry Reglet or others, as approved by Architect.

1. Pre-finish coping in Kynar 500 coating of standard color as selected by Architect.

C. All other flashing: Provide minimum 22-gauge galvanized flashing to the sizes and shapes as detailed on the drawings. All exposed flashing shall be primed and painted per the paint specification sections. Provide minimum two (2) coats of paint.

D. Expand-O-Flashing, for Expansion Joints at Roof Expansions and Roof/Wall Expansion Joint Conditions: Provide factory Expand-O-Flash by Johns Manville or equal. Provide 10 foot or maximum lengths possible. Fabricate Expand-O-Flash expansion joint covers as detailed on the drawings. Use Type N-Neoprene Sheet-Black, flange shall be minimum 26 ga. galvanized steel bellows width minimum 4 inches.

E. Expansion and Seismic Covers for Expansion Joints and Seismic Joints for Floors, Ceilings, Walls and Roofs: Provide factory aluminum joint covers by Balco Inc. or equal. Provide maximum lengths possible. Fabricate expansion and seismic joints covers Model No. RDA-4 with aluminum center plate. Provide extruded aluminum sub-channel (6063-T5) standard mill finish. Movement capabilities shall be at 50 percent or as recommended by the manufacturer.

1. At Rated Expansion and Seismic Joint Conditions up to 2 Hour Rated Systems: Use Balco Fire Barrier Systems as tested in accordance with ASTM E1966-24 and as listed with Omega Point Laboratories Inc.
2. Expansion and Seismic Joint Covers at Interior, Vertical, and Ceiling Surfaces: Use 6000 Series No. 6GOU- Aluminum snap lock cover plate with standard aluminum mill finish.
3. Expansion and Seismic Joint Cover at Exterior Vertical and Ceiling/Soffit Surfaces: Use FCWW aluminum with standard mill finish.

F. All Expansion and Seismic Covers that intersect at Floor to Wall, Wall to Ceiling/Soffit, Roof to Parapet, etc.: Use factory preassembled transition pieces that will meet the manufacturers' minimum requirement for a watertight intersection connection.

G. Balconies Edge Flashing: Use Schluter-Bara-Rak powder-coated aluminum edging profile with drip lip. Extruded aluminum to ASTM B221-21, 6463-T5 alloy with integral trap E201-DAL-perforated anchoring leg and complete with outside/inside corners and connectors. Length 8 ½ inches long. Color from standard color. Use a thin set mortar over the trapezoid perforated anchoring leg. Apply waterproof membrane per manufacturers' requirements.

PART 3 – EXECUTION

3.01 PREPARATION

A. Inspect substrate conditions prior to installation of sheet metal items. Conditions which could be detrimental to correct and proper installation of sheet metal assemblies are to be called to the attention of the Owner for their disposition prior to sheet metal work being installed.

B. Coordinate fabrication and installation of sheet metal items with work of others such as roofing, curtainwall and windows, sealants, mechanical and electrical.

3.02 INSTALLATION

A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations and with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

B. Underlayment: Where stainless steel or aluminum is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.

C. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

D. Install reglets to receive counterflashing in manner and by methods indicated. Where shown in concrete, furnish reglets to trades of concrete work for installation as work of Division 3 sections. Where shown in masonry, finish reglets to trades of masonry work, for installation as work of Division 4 sections.

E. Install counter flashings in reglets, either by snap-in seal arrangement or by welding in-place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated in depending on degree of sealant exposure.

F. Install elastic flashing in accordance with manufacturer's recommendations. Where required, provide for movement as joints by forming loops or bellows in width of flashing. Locate cover or filler strips at joints to facilitate complete drainage of water for flashing. Seam adjacent flashing sheets with adhesive, seal and anchor edges in accordance with manufacturer's recommendations.

G. Nail flanges of expansion joint units to curb nailers, at maximum spacing of 6 inches o.c. Fabricate seams at joints between units with minimum 3-inch overlap, to form a continuous, waterproof system.

H. Conductor Head Guards: Install "bee-hive type" strainer-guard at conductor heads, removable for cleaning downspouts.

I. Flash around exterior openings in the building where other waterproofing methods are insufficient.

J. Joints

1. Typically, provide flat locked joints with sealant between metal surfaces, unless shown otherwise. Where standing seams are required, provide with folded corners.
2. Provide minimum of 3-inch laps.
3. Where concealed joints are possible, provide flat locked joints with 3-inch reinforcing behind, set-in full bed of sealant.
4. Do not leave sheet metal joint unsealed. See sealant section of these specifications.

3.03 INSPECTION

A. Immediately following installation of sheet metal work, touch-up areas where primer has been removed during installation operations and where soldering has occurred.

B. Where architectural coatings are provided, touch-up marred or abraded finishes with compatible coating which can be expected to provide the same serviceability as factory applied coatings.

3.04 CLEANING

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

3.06 PROTECTION

A. Advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration other than natural weathering at time of Substantial Completion.

END OF SECTION

REVISION SUMMARY

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The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

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- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-11-11 Updated from CBC 2022 to CBC 2025 as applicable

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- None at this time.

SECTION 07 71 23

GUTTERS AND RELATED FLASHINGS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Galvanized steel gutters.
2. Downspouts.
3. Related flashing.

B. Related Sections

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 05 50 00 - Metal Fabrications.
3. Section 07 60 00 - Sheet Metal Flashing and Trim.
4. Section 07 52 16 – SBS Modified Bituminous Membrane Roofing.
5. Section 07 54 19 – Polyvinyl-Chloride Roofing.
6. Refer to Division 7, for Roofing Sections, and Prefabricated roof curbs, hatches, roof deck insulation, and Division 8 component daylight systems.
7. Section 07 90 00 - Sealants.
8. Section 09 91 00 - Painting: Field painting of metal surfaces.

1.02 REFERENCES

A. ASTM A924 ~~/ A924M-16ae1~~22a – Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

B. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.

C. SMACNA - Architectural Sheet Metal Manual, current edition.

D. AWS - American Welding Society.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Shop Drawings: Indicate locations, configurations, jointing methods, welding methods, fastening methods, expansion joint layouts, downspout layout and installation details.

C. Samples: Submit two samples, 12 inches long illustrating component design, finish, color, and configuration.

1.05 QUALITY ASSURANCE

A. Conform to SMACNA Manual for architectural sheet metal flashing and installation details.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01 66 00.

B. Stack pre-formed material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.

C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

1.07 COORDINATION

A. Coordinate painting portions prior to installation and the work with downspout discharge pipe inlet.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Galvanized Steel: ASTM A924 / A924M-09a, Grade A, G90 zinc coating.

B. Schedule 10 galvanized pipe.

2.02 COMPONENTS

A. Gutters: 18-gauge core steel. Minimum size shall be 6”x6” or as otherwise shown on drawings.

B. Downspouts: Finished grade to bottom of gutter shall be schedule 10 galvanized pipe, round shape only, 3” minimum diameter or size as shown on drawings.

2.03 ACCESSORIES

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A. Anchorage Devices: SMACNA requirements.

B. Gutter Supports: Straps.

C. Fasteners: Galvanized steel or stainless steel and as specified in Section 05 50 00. Finish exposed fasteners same as flashing metal.

D. Clean out Tee: Smith 4510 cleanout tee with countersunk plug and round access cover. 4”, 5” or sized as required to coordinate with downspout and underground piping sizes.

E. Touch-up Primer: Cold applied zinc-rich type.

F. Protective Back Coating: FS TT-C-494, bituminous.

G. Sealant: Type as specified under Section 07 90 00.

H. Conductor-Head Guards: 20-gauge bronze or nonmagnetic stainless-steel mesh or fabricated units, with salvaged edges and noncorrosive fasteners. Select materials for compatibility with gutters and downspouts.

I. Overflow Drain: 18 ga. galvanized sheet metal. Approximately 2 inches high by 2 inch diameter.

2.04 FABRICATION

A. Form gutters of profiles and size indicated, to SMACNA requirements.

B. Gutters shall be fascia mounted whenever possible. See drawings for additional mounting information.

C. Fabricate with required connection pieces.

D. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.

E. Hem all exposed edges of metal.

F. Welding process shall be Metallic Inert Gas (MIG).

G. Weld all shop formed metal joints. Grind exposed joints flush with adjacent surfaces and apply touch-up primer as specified.

H. Butt weld all field assembled gutter sections. Grind exposed joints flush with adjacent surfaces and apply touch-up primer as specified.

I. Fabricate gutter sections with SMACNA butt type expansion joints at 40 feet maximum with a minimum of one (1) downspout in each 40 foot section. Provide additional downspouts as necessary to accommodate expansion joint locations.

J. All joints shall be watertight per SMACNA standards.

K. All downspouts shall have fully welded joints and be ground smooth. Provide T-shaped bracket welded to back of downspout for bolting to building. See drawings for additional information.

L. All downspouts that spill to grade shall have a 45-degree elbow of same pipe profile fully welded to bottom of downspout.

M. All downspouts connecting to underground storm drainage systems shall be provided with a cleanout tee at grade.

N. At all individual gutter sections, provide an overflow drain at opposite end of gutter from downspout. Overflow drain shall be fully welded to gutter bottom. I.D. shall match the I.D. for the downspout outlet.

2.05 FINISHES

A. Field paint gutters under provisions of Section 09 91 00.

B. Apply bituminous protective backing on surfaces in contact with dissimilar materials.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work.

3.02 INSTALLATION

A. Install gutters and downspouts as shown on drawings. Install expansion joints, additional downspouts and accessories as specified.

B. Field assemble (weld) gutter sections at "ground level" wherever possible and lift into place as one unit.

C. All downspout sections shall be fully welded, ground smooth, primed and painted. All downspouts shall be mechanically fastened to building at top, bottom, and maximum 6 feet on center.

D. Install gutters level and straight in line with building. Shim horizontally and vertically as required to level. Installed gutter to have no ponding water more than ¼" deep.

E. Water test all gutters and downspouts for leaks and ponding in presence of IOR.

F. At all welded connections, end caps, overflows, and outlets, provide bituminous coating minimum 1 inch each side of joint.

G. Provide 3-inch closure plate at all gutter expansion joint locations.

END OF SECTION

REVISION SUMMARY

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- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2023-01-06 – Corrected wrong references to other spec sections.
- 2025-01-25 – Removed references to fire sealants. This type of material is not District defined and is project specific to be provided elsewhere by Design Team.
- 2025-11-11 – Updated from CBC 2022 to CBC 2025 as applicable

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SECTION 07 90 00

JOINT SEALERS

PART 1 – GENERAL

1.01 SUMMARY

A. SECTION INCLUDE

1. Preparing sealant substrate surfaces.
2. Concrete Joint Sealants.
3. Sealant and backing.

B. RELATED SECTIONS

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 00 72 13: General Conditions.
3. Section 03 30 00: Cast-In-Place Concrete.
4. Section 07 60 00: Flashing and Sheet Metal: Sealants used in conjunction with metal flashings.
5. Section 07 71 23: Gutters and Related Flashings.
6. Section 08 11 00: Metal Doors and Frames: Perimeter sealants.
7. Section 09 29 00: Gypsum Board Systems.
8. Division 22: Mechanical.
9. Division 26: Electrical.
10. Section 32 16 00: Site Concrete.

C. REFERENCES

1. ASTM C834-17(2023) Standard Specification for Latex Sealants.
2. ASTM C920-18(2024) Standard Specification for Elastomeric Joint Sealants.
3. ASTM E84-24 Standard Test Method for Surface Burning Characteristics of Building Materials.
4. ASTM E119-03a(2023)e1 Standard Test Methods for Fire Tests of Building Construction and Materials.
5. ASTM E814-24 Standard Test Method for Fire Tests of Penetration Firestop Systems.
6. FM (Factory Mutual) - Fire Hazard Classifications.
7. UL - Fire Hazard Classifications.
8. UL 263 – Standard for Fire Tests of Building Construction and Materials.
9. UL 723 - Test for Surface Burning Characteristics of Building Materials.
10. UL 1479 - Fire Tests of Through-Penetration Firestops.
11. FS TT S 00227 Sealing Compound: Elastomeric Type, Multi-Component.
12. FS TT S 00230 Sealing Compound: Elastomeric Type, Single Component.
13. FS TT S 001543 Sealing Compound, Silicone Rubber Base.

1.02 SUBMITTALS

A. Submit manufacturer’s product data under provisions of Section 01 33 00for each product required.

B. Submit product data indicating sealant chemical characteristics, performance criteria, limitations, and color availability.

C. Submit samples under provisions of Section 01 33 00.

D. Submit standard color ranges of exposed materials for Architect selection.

E. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.03 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three years’ experience.

B. Applicator: Company specializing in applying the work of this section with minimum three years’ experience, with projects of a similar size and type.

C. Conform to Sealant Waterproofing and Restoration Institute requirements for materials and installation.

D. Prior to installation of joint sealants, field test adhesion to joint substrates.

1. Install joint sealants in 5-foot joint lengths. Allow to cure before testing. Test adhesion by pulling sealant out of joint.
2. Perform field tests for each type of elastomeric sealant and joint substrate.
3. Arrange for tests to take place with joint sealant manufacturer’s technical representative present.
4. Report whether or not sealant in joint connected to pulled out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
5. Sealants not evidencing adhesive failure from testing, in absence of other indications of non-compliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrate during testing.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Do not install solvent curing sealants in enclosed building spaces.

B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

C. Do not install sealants under adverse weather conditions or when temperatures are above or below manufacturer's recommended limitations for installation.

D. Deliver materials in the unopened, original containers or unopened packages with manufacturer's name, labels, product identification, color, expiration period, curing time and mixing instructions for multi-component materials.

1.05 SEQUENCING AND SCHEDULING

A. Coordinate the work of this Section with all Sections referencing this Section.

1.06 WARRANTY

A. Provide two-year warranty for materials and workmanship under provisions of Section 01 33 00.

B. Warranty: Include coverage of installed sealants and accessories which fail to achieve airtight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 – PRODUCTS

2.01 SEALANTS

A. Silicone Sealant: Silicone Sealant (use at concrete, masonry, or glazing applications): FS TT S 01543, Class A, low modulus type; Spectrum I as manufactured by Tremco, Inc.

B. Interior Building Sealant: Acrylic-emulsion; one-part, non-sag, mildew-resistant. Complying with ASTM C834-17(2023), formulated to be paintable; Pecora Corp. "AC-20", Sonneborn "Sonolac", Tremco Inc. "Tremco Acrylic Latex 834" or approved equal.

C. Sanitary Sealant: One-part mildew-resistant silicone; ASTM C920-18(2024) Type S; Grade NS Class 25; Uses NT, G, A and O; formulated with fungicide for sealing interior joints with nonporous substrates around ceramic file, showers, sinks and plumbing fixtures; Dow Corning Corp. "786 Mildew Resistant", or approved equal.

D. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, non-skinning, non-staining, gun-able, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound; Pecora Corp. "BA-98", Tremco Inc. "Tremco Acoustical Sealant" or approved equal.

E. Acoustical Sealant for Exposed Joints: Nonoxidizing, skin-able, paintable, gun-able sealant recommended for sealing interior exposed joints to reduce transmission of airborne sound; Pecora Corp. "AC-20", USG "Sheetrock Acoustical Sealant" or approved equal.

F. Concrete Expansion Joints: Joint sealing material shall be a two-component, self-leveling, polyurethane elastomeric sealant. Product shall be Sikaflex 2cSL as manufactured Sika Corporation, or equal. Color shall be chosen from the full range of manufacturer's standard colors.

G. Vertical Building Expansion Joints: Joint sealing material shall be a one-component, polyurethane-based non-sag elastomeric sealant. Product shall be Sikaflex Construction Sealant as manufactured Sika Corporation, Pecora Corp. “DynaTrol II” or approved equal. Color shall be chosen from the full range of manufacturer’s standard colors.

H. Sheet Metal Flashings, Trims, Gutters, & Joints: Joint sealing material shall be a two-component, self-leveling, polyurethane elastomeric sealant. Product shall be Sikaflex 2cSL as manufactured Sika Corporation, or equal. Color shall be chosen from the full range of manufacturer’s standard colors. Provide Sikaflex 260 Primer at all stainless steel and/or galvanized substrate location for proper adhesion of Sikaflex 2cSL.

I. Substitutions: Under provisions of Section 01 33 00.

J. Color of sealant shall be as selected by Architect.

2.03 ACCESSORIES

A. Primer: Non staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Noncorrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Non-staining; compatible with sealant and primer; such as round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width. Materials impregnated with oil, bitumen or similar materials shall not be used. Sealant shall not adhere to back-up material.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

E. Solvents: cleaning agents or other accessory materials shall be as recommended by the sealant manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and joint openings are ready to receive work and field measurements are as shown on Drawings and recommended by the manufacturer.

B. Beginning of installation means installer accepts existing surfaces.

3.02 PREPARATION

A. Clean and prime joints in accordance with manufacturer's instructions.

B. Remove loose materials and foreign matter which might impair adhesion of sealant.

C. Verify that joint backing and release tapes are compatible with sealant.

D. Perform preparation in accordance with sealant manufacturer's recommendations.

E. Protect elements surrounding the work of this Section from damage or disfiguration.

F. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or acid washing to produce a clean, sound substrate. Remove loose particles remaining from cleaning operations by vacuuming or blowing out joints.

G. Clean metal, glass, glazed surfaces of ceramic tile and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealants.

3.03 INSTALLATION

A. Install sealant in accordance with manufacturer's instructions.

B. Caulk all exterior joints and openings in the building envelope that are observable sources of air infiltration.

C. Measure joint dimensions and size materials to achieve required width/depth ratios.

D. Install joint backing to achieve a neck dimension no greater than 1/3 the joint width. Roll the material into the joint to avoid lengthwise stretching. Do not twist or braid rod stock.

E. Install bond breaker where joint backing is not used.

F. Prime surfaces to receive joint sealant with primer recommended by sealant manufacturer.

G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges. Apply masking tape where required to protect adjacent surfaces from sealant application.

H. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

I. Tool joints concave.

J. At all surface-mounted light fixtures mounted on gypsum board ceilings, contractor shall caulk light fixture body to ceiling finish to eliminate gap between metal body and fixture. Coordinate locations with drawings.

3.04 CLEANING AND REPAIRING

A. Clean work under provisions of Section 01 77 00.

B. Clean adjacent soiled surfaces. Use a solvent or cleaning agent as recommended by the sealant manufacturer.

C. Repair or replace defaced or disfigured finishes caused by work of this Section.

3.05 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Section 01 66 00.

B. Protect sealants until cured.

C. Do not paint sealants until sealant is fully cured.

D. Do not paint silicone sealant.

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

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Please delete this page prior to issuance.

- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-11-11 Updated from CBC 2022 to CBC 2025 as applicable

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When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

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All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- Knock down frames are okay for modernization work.
- Metal or FRP doors at exterior locations. No exterior wood doors.

SECTION 08 11 00

METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:

1. Non-rated and fire rated rolled steel doors, panels, and frames.
2. Louvers.

B. Referenced Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 08 14 00 - Wood Doors and Frames.
3. Section 08 16 13 - FRP Doors.
4. Section 08 43 00 - Storefronts.
5. Section 08 71 00 - Door Hardware.
6. Section 08 80 00 - Glazing.

1.02 REFERENCES

A. ANSI A250 .8 – Recommended Specification for Standard Steel Doors and Frames.

B. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory-Applied Finish Painted Steel Surfaces for Steel Doors and Frames.

C. ANSI A250 .10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

D. ASTM A653-25 - Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot- Dip Process.

E. ASTM A924-22a - General Requirements for Steel Sheet, Zinc-Coated (Galvanized} by the Hot-Dip Process.

F. CEC - California Energy Commission.

G. NFPA 80 - Fire Doors and Windows.

H. SDI-105 - Recommended Erection Instructions for Steel Frames.

I. DHI - Door and Hardware Institute.

J. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2 and Part 6.

K. UL 9 - Fire Tests of Window Assemblies.

L. UL 10C - Fire Tests of Door Assemblies.

1.03 QUALITY ASSURANCE

A. Conform to requirements of ANSI A250.8.

B. Fire rated door, panel and frame construction to conform to UL 9 and UL 1OC.

C. Installed frame and door assembly to conform to NFPA 80 for fire rated class indicated on Drawings.

D. Installed exterior frame and door assembly to be weather tight

E. Manufacturer shall have both fabrication and assembly plant located within the continental United States or Canada. Products that are either fabricated or assembled outside the continental United States or Canada are not acceptable.

1.04 SYSTEM REQUIREMENTS

A. Performance Requirements

1. Thermal Performance: Glazed exterior borrowed lite, side lite and transom lite frames shall have an overall minimum u-value of 1.19 as rated in accordance with the default table method approved by the California Energy Commission (CEC). Provide Label Certificate FC-1, Figure 3-3, from the Nonresidential Compliance Manual documenting compliance with the CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 6, Section 116, Table 116-A.
2. Solar Heat Gain Coefficient: Glazed exterior borrowed lite, side lite and transom lite frames shall have an overall maximum solar heat gain coefficient of 0.68 as rated in accordance with default table method approved by the California Energy Commission (CEC). Provide Label Certificate FC-1, Figure 3-3, from the Nonresidential Compliance Manual documenting compliance with the CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 6, Section 116, Table 116-B.

A. Regulatory Requirements

1. Conform to CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 2 for fire rated frames and doors.
2. Conform to CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 6, for u- value and solar heat gain coefficient.

1.05 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01 33 00.

B. Indicate frame configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.

C. Indicate door elevations, internal reinforcement, closure method, and cut outs for glazing and louvers.

D. Submit two (2) samples of exterior frame profile at mullion intersection.

E. Submit Label Certificate FC-1, Figure 3-3, from the Nonresidential Compliance Manual documenting compliance with the CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 6, Section 116, Table 116-A and 116-8.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products under provisions of Section 016200.

B. Store products on site under cover.

C. Place products on at least 4-inch wood sills to prevent rust and damage.

D. Protect doors and frames with resilient packaging.

1.08 SEQUENCING AND SCHEDULING

A. Sequence work under the provisions of Section 01 32 13.

B. Schedule work under the provisions of Section 01 32 13.

C. Schedule delivery of all doors and frames so as not to delay progress of other trades.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Amweld Building Products, Inc., www.amweld.com.

B. Curries Mfg. Inc., www.curries .com.

C. Door Components, Inc., www.door components .com.

D. Fleming, www.flemingdoor.com.

E. Krieger Steel Products Company, www.kriegersteel.com.

F. Republic Builders Products Corporation, www.republicdoor .com.

G. Curries, www.curr ies.com.

H. Ceco, www.cecodoor .com.

I. Substitutions: Under provisions of Section 01 25 13.

2.02 MATERIALS

A. Doors, Panels and Frames

1. Steel: Commercial quality cold rolled steel conforming to ASTM A653-25 galvanized to A60 or G60 coating class or Type 8, A40 (ZF120) according to ASTM A924 with minimized spangle, mill phosphatized.
2. Exterior Doors: ANSI A250.8, Level 3, extra heavy-duty, Model 2, continuous welded seam, minimum 0.053-inch-thick faces (16 GA. Minimum).
3. Interior Doors: ANSI A250.8, Level 2 heavy duty, Model 1, minimum 0.042-inch-thick faces (18 GA. Minimum).
4. Exterior Frames: ANSI A250 .8, Level 3, 0.067-inch-thick material (14 GA. Minimum), core thickness.
5. Interior Frames: ANSI A250 .8, Level 2, 0.053-inch-thick material (16 GA. Minimum), core thickness.
6. Panels: Same materials and construct-ion as specified for doors.

B. Door Core

1. Exterior Core: Polystyrene insulation.
2. Interior Door Core: Impregnated cardboard honeycomb.

C. Closer Channels

1. Close top and bottom edge of exterior door flush with inverted steel channel closure. Weld all joints watertight.

D. Frame Anchors

1. Masonry Anchors: Adjustable T-strap, 0.053-inch-thick steel, corrugated, 2-inch x 10-inch size. Fire rated frames to have UL listed perforated strap anchor permanently anchored to frame.
2. Metal Stud Anchor: Z type anchor, welded to frame, 0.053-inch-thick steel, UL listed as required for fire rating.
3. Wood Stud Anchor: U shaped anchor, welded to frame, 1 inch wide, 0.053-inch-thick steel, with 2 pre- punched holes in nailing flange. UL listed as required for fire rating.

4. Existing Wall Anchor: 0.053-inch-thick pipe spacer with 2-inch x 0.053-inch-thick steel plate sized to accommodate a 3/8 diameter countersunk flathead expansion anchor. UL listed as required for fire rating.
5. Floor Clip: Angle anchor, full width of frame, 0.067-inch-thick steel.

E. Protective Coatings

1. Bituminous Coating: Fibered asphalt-based corrosion proofing and sound deadener compound. Equivalent to Transcoat 101-F, www.oilservice.com.
2. Primer: Clean and treat with three stage iron phosphate process. Provide baked-on shop coat of EPA compliant gray synthetic rust - inhibitive enamel primer meeting acceptance criteria of ANSI 250.10.

F. Hardware Reinforcement

1. Fabricate frames and doors with hardware reinforcement plates welded in place.
2. Hinge reinforcing shall be full width of frame profile.
3. Provide spacers for all thru-bolted hardware.
4. Reinforcement components shall be the following minimum thickness:
5. Hinge (door and frame) 3/16 inch
6. Mortise Lock or Deadbolt 0.093 inch
7. Bored Lock or Deadbolt 0.093 inch
8. Flush Bolt Front 0.093 inch
9. Surface Bolt 0.093 inch
10. Surface Applied Closer 0.093 inch
11. Hold Open Arm 0.093 inch
12. Pull Plates and Bars 0.067 inch
13. Surface Exit Device 0.093 inch
14. Floor Checking Hinge 0.167 inch
15. Pivot Hinge 0.167 inch

2.03 ACCESSORIES

A. Door Louvers: 18-gauge, non-vision, inverted split “Y louver with 12-gauge security grille two sides, prime coat finish for field painting. Provide optional galvanized attached mesh insect screen. Size as shown on Drawings.

1. Anemostat security door louvers, model #PLSL.
2. Air Louvers Inc., Model 1500-A.

B. PeepHoles: Schlage 190 Degree Wide Angle Viewer. Satin nickel finish.

C. Rubber Silencers: Resilient rubber as supplied by Section 08 71 00.

D. Glazing Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamperproof screws at door installations, square butt at light frames.

2.03 FABRICATION

A. When shipping limitations so dictate, frames for large openings shall be fabricated in sections designed for splicing·

B. All spliced joints shall occur on the interior side of exterior frames.

C. Fabricate frames as full profile welded units.

D. All face, rabbet and soffit joints between abutting members shall be continuously welded and finished smooth when exposed to exterior.

E. Corner joints shall have all contact edges closed tight, with faces mitered and continuously welded.

F. Frames with multiple openings shall have mullion members fabricated with no visible seams or joints. All face, rabbet and soffit joints between abutted members shall be continuously welded and finished smooth when exposed to exterior.

G. Provide 3/8-inch back bend return on frames where gypsum board wall material occurs whether on one or both sides.

H. Mullions for Double Doors: Removable type supplied by Section 08 71 00.

I. Dust cover boxes or mortar guards of 0.016-inch-thick steel shall be provided at all hardware mortises on frames.

J. Reinforce frames wider than 48 inches with roll formed, 0.093-inch-thick steel channels fitted tightly and welded into frame head, inverted U-shape profile.

K. Prepare frame for silencers except for frames which receive weatherstripping. Provide three (3) single rubber silencers for single doors on strike side, and two (2) single silencers on frame head at double doors without mullions.

L. Provide steel spreader temporarily attached to feet of both jambs as a brace during shipping and handling. Spreader is not to be used for installation purposes.

M. Attach fire rated label to each frame and door unit.

O. Manufacturing Tolerances

1. Manufacturing tolerance shall be maintained within the following limits:
2. Frame width +1/16 inch -1/32 inch
3. Frame height +-3/64 inch
4. Frame face +-1/32 inch
5. Frame stop +-1/32 inch

6. Frame rabbet +-1/64 inch
7. Frame depth +-1/32 inch
8. Frame throat +-1/16 inch
9. Door width and height +-3/64 inch
10. Door thickness +-1/16 inch
11. Hardware location +-1/32 inch
12. Door flatness +-1/16 inch

2.4 FINISHES

A. Primer: Baked on rust-inhibitive enamel.

B. Finish: Site paint under provisions of Section 09 91 00.

C. Coat inside of frame profile for frames installed in masonry construction with bituminous coating to a thickness of 1/16 inch. Coating may be factory or site applied. Do not apply coating to fire rated frames.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install frames in accordance with SDI-105.

B. Install doors in accordance with DHI.

C. Install fire doors and frames in accordance with NFPA 80.

D. Installation of exterior doors and frames to be weathertight and waterproof.

E. Seal penetration of all surface applied screws on exterior face of frames at glass stops and hardware attachments.

F. Coordinate with wall construction and details for anchor placement. Provide anchors as follows:

G. Frames up to 7 feet 6 inches height - 4 anchors each jamb.

H. Frames 7 feet 6 inches to 8 feet 0-inch height - 5 anchors each jamb, plus an additional anchor for each 2 feet or fraction thereof over 8 feet 0 inch.

I. Frames for double doors; minimum of two (2) anchors in head approximately 12 inches from each jamb.

J. Borrowed lite frames; two (2) anchors each jamb plus 1 for each 18 inches or fraction thereof over 3 feet 0 inch. Minimum two (2) anchors in head and sill approximately 12 inches from each jamb plus 1 for each 30 inches of length or fraction thereof.

K. Floor anchors - one (1) anchor each jamb for interior doors. Where wall construction will not allow placement of floor anchor, provide one (1) additional jamb anchor as close to floor as possible.

L. Existing wall anchors shall be welded to provide non-removable condition. Welded bolt head to be ground, dressed and finished smooth.

M. Frames installed in masonry walls to be fully grouted with masonry grout.

N. Exposed field welds to be finished smooth and touched up.

O. Primed or painted surfaces which are scratched or marred shall be touched up.

P. Hardware to be applied in accordance with hardware manufacturer's templates and instructions.

Q. Coordinate installation of glass and glazing.

R. Install door louvers.

S. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.02 CONSTRUCTION

A. INSTALLATION TOLERANCES

1. Edge clearance for swinging doors shall not exceed the following:
   a. Between door and frame at head and jamb: 1/8 inch.
   b. Between edge of pair of doors: 1/8 inch.
   c. At door sill with threshold. (From bottom of door to top of threshold): 3/8 inch.
   d. At door sill with no threshold: 1/2 inch.
   e. At door bottom and rigid floor covering per NFPA 80: 1/2 inch.
   f. At door bottom and nominal floor covering per NFPA 80: 5/8 inch.

2. Frame installation tolerance shall not exceed the following:
   a. Squareness +-1/16 inch.
   b. Alignment +-1/16 inch.
   c. Plumbness +-1/16 inch.
   d. Diagonal Distortion +-1/32 inch.

END OF SECTION

REVISION SUMMARY

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- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-11-11 Updated from CBC 2022 to CBC 2025 as applicable

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- None at this time.

SECTION 08 31 00

ACCESS DOORS AND PANELS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Steel access panels, except those specified under Divisions 22 - Plumbing, 23 - HVAC, or 26 - Electrical.

B. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 06 10 00 - Rough Carpentry.
3. Section 09 24 23 - Cement Plaster and Metal Lath.
4. Section 09 29 00 - Gypsum Board.
5. Section 09 30 00 - Ceramic Tiling.
6. Section 09 91 00 - Painting and Coating.
7. Division 22 - Plumbing.
8. Division 23 - HVAC.
9. Division 26 - Electrical.
10. Division 27 - Communications.

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1.02 SUBMITTALS

A. Shop Drawings:

B. Indicate sizes, materials, thickness, fabrication methods, panel door and frame reinforcement, anchorage, and installation details.

C. Provide layout drawings, indicating dimensioned locations of proposed access panels, size of each panel, and installation details. Determine and indicate required access panels in finished surfaces, whether furnished under this section or as part of Work of Divisions 22-Plumbing, 23- HVAC, and 26-Electrical.

1.03 QUALITY ASSURANCE

A. Panels shall be provided with UL listings and labels.

B. Access panels and frames shall be products of one (1) manufacturer.

C. Coordinate access panels with plumbing, HVAC, and electrical work.

1.04 DELIVERY, STORAGE AND HANDLING

A. Panels and Frames: Provide protection as required by manufacturer to protect panels from damage during storage.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Access Panels:

Non-Rated	Milcor	Karp	Nystrom
Ceramic Tile	MS	DSC214M	NT
Plaster	K	DSC214M	NP
Drywall, Plaster Veneer	DW	DSC214M	NW
Fire Rated			
Ceramic Tile	MS	KRP150FR	IT
Plaster	M	KRP150PR	IP
Drywall, Plaster Veneer	M	KRP150FR	IW

B. Or approved equal.

C. Unless otherwise indicated, provide brushed stainless-steel finish for panels installed in ceramic tile. Provide prime coat finish suitable for field painting for panels installed in other finishes.

D. Access Panels shall be 18 gauge minimum with vandal-proof lock operated by Allen wrench or another special tool. Exposed fastenings shall be secured with vandal-proof screws.

E. Ceiling Access Doors.

1. Provide exterior type single-door by Dur-Red Products, Model TCA, 30 inches by 36 inches in size.
   a. Door Leaf: 1-inch-thick core rigid fiberglass with 20-gauge steel outer shell.
   b. Finish: Primer grey and painted minimum two (2) coats of paint. Color to match adjacent ceiling color finish.

2. Install ceiling access door where access to the enclosed attic spaces is required and/or as shown in the drawings. If not shown in the drawings, provide one ceiling access panel in each enclosed drywall ceiling room. Where ceiling is rated, the ceiling access door shall meet or exceed the rating of the ceiling. All ceiling access doors shall receive keyed locks.

PART 3 – EXECUTION

3.01 GENERAL

A. Provide access panels in finish construction, where indicated on Drawings, wherever required for access to concealed mechanical and electrical equipment, and where required by codes. Panels indicated on architectural Drawings shall be furnished under this section. Required panels for access to equipment, but not indicated on architectural Drawings, shall be furnished as part of Work requiring access.

3.02 INSTALLATION

C. Install panels accurately in location, perfect alignment, plumb, straight and true. Brace to prevent displacement by adjacent Work.

B. Examine panels after installation for proper opening, closing and clearances. Replace damaged or defective panels.

3.03 CLEANING

A. Remove rubbish, debris and waste materials and legally dispose of off Project site.

3.04 PROTECTION

A. Protect Work of this section until Substantial Completion.

END OF SECTION

REVISION SUMMARY

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- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2023-01-06 – Clarified references to gate hardware.
- 2025-01-31 – Minor edits to hardware information and model numbers.
- 2025-11-11 – Updated from CBC 2022 to CBC 2025 as applicable. Made revision to lock protector model number. Revised hinge type per location.

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- District currently does keying schedules but wants contractor to do the actual keying on future jobs.
- All keyways shall be Primus.
- Any access control shall be "fail-secure".
- Confirm all exterior doors have columbine function.
- If power transfer hinges are needed, they shall NOT use armored whips. Only use internal power transfers.

- At exterior doors, provide a peep hole. District prefers these over a vision lite.

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. This Section includes the following, but is not necessarily limited to:

1. Door Hardware, including electric hardware.
2. Storefront and Entrance door hardware.
3. Gate Hardware.
4. Digital keypad access control devices.
5. Thresholds, gasketing and weather-stripping.
6. Door silencers or mutes.

C. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 08 11 00 – Metal Doors and Frames.
3. Section 08 14 00 – Wood Doors and Frames.
4. Section 08 16 13 – FRP Doors.
5. Section 08 43 00 – Storefronts.
6. Section 32 31 13 – Chain Link Fences.
7. Section 32 31 19 – Decorative Metal Fences and Gates (for hinge/closer units).

D. Related Documents

1. Drawings and general provisions of Contract, including General and Supplementary Conditions of Division 1 Specification Sections, apply to this Section.

1.02 REFERENCES

A. 202~~5~~2 California Building Code, CCR, Title 24.

B. BHMA – Builders' Hardware Manufacturers Association

C. CCR – California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.

D. DHI – Door and Hardware Institute

E. NFPA - National Fire Protection Association.

1. NFPA 80 – Standard for Fire Doors and Other Opening Protectives
2. NFPA 105 – Standard for Smoke Door Assemblies and Other Opening Protectives

F. UL - Underwriters Laboratories.

1. UL 10C – Standard for Positive Pressure Fire Tests of Door Assemblies
2. UL 305 – Standard for Panic Hardware

G. WHI - Warnock Hersey Incorporated

H. SDI - Steel Door Institute

1.03 SUBMITTALS & SUBSTITUTIONS

A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.

B. Submit product data (catalog cuts) including manufacturers' technical product information for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

C. Submit six (6) copies of schedule organized vertically into "Hardware Sets" with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:

1. Include a Cover Sheet with;
   a. Job Name, location, telephone number.
   b. Architects name, location and telephone number.
   c. Contractor's name, location, telephone number and job number.
   d. Suppliers name, location, telephone number and job number.
   e. Hardware consultant's name, location and telephone number.

2. Job Index information included;
   a. Numerical door number index including; door number, hardware heading number and page number.
   b. Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available; if it is not available at the time the preliminary schedule is submitted.
   c. Manufacturers' names and abbreviations for all materials.

d. Explanation of abbreviations, symbols, and codes used in the schedule.
e. Mounting locations for hardware.
f. Clarification statements or questions.
g. Catalog cuts and manufacturer's technical data and instructions.

3. Vertical schedule format sample:

a. Single or pair with opening number and location.
b. Degree of opening
c. Hand of door(s)
d. Door and frame dimensions and door thickness.
e. Label requirements if any.
f. Door by frame material.
g. (Optional) Hardware item line #.
h. Keyset Symbol.
i. Quantity.
j. Product description.
k. Product Number.
l. Fastenings and other pertinent information.
m. Hardware finish codes per ANSI A156.18.
n. Manufacture abbreviation.

D. Make substitution requests in accordance with Division 1. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.

E. Wiring Diagrams: Provide product data and wiring and riser diagrams for all electrical products listed in the Hardware Schedule portion of this section.

F. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

G. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

H. Furnish as-built/as-installed schedule with close-out documents, including keying schedule and transcript, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.

I. Fire Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.

J. LEED Certification Points: Submit information and certifications necessary to achieve maximum points for LEED certification; coordinate and cooperate with Owner and Architect in providing information necessary for required LEED rating.

1.04 QUALITY ASSURANCE

A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.

B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

1. Responsible for detailing, scheduling and ordering of finish hardware.
2. Meet with Owner to finalize keying requirements and to obtain final instructions in writing. To maintain the integrity of patented key systems, provide a letter of authorization from the specified manufacturer indicating that supplier has authorization to purchase the key system directly from the manufacturer.
3. Stock parts for products supplied and are capable of repairing and replacing hardware items found defective within warranty periods.

C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented experience.

D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.

1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

F. Product packaging to be labelled in compliance with CA Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986.

G. Pre-Installation Conference

1. Schedule a pre-installation conference at least one week prior to beginning work of this section.
2. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, Key Owner Personnel, and Project Inspector.
3. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review Owner’s keying standards.

1.05 DELIVERY, STORAGE AND HANDLING

A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.

B. Hardware items shall be individually packaged in manufacturers' original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.

C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.

D. Contractor to inventory door hardware jointly with representatives of hardware supplier and hardware installer until each all are satisfied that count is correct.

1.06 WARRANTY

A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:

1. Locksets: "L" Series (3) years – "ND" Ten (10) years.
2. Electronic: One (1) year.
3. Closers: Thirty (30) years –1260 twenty (20) years –Concealed High Security fifteen (15) years except electronic closers shall be two (2) years.
4. Exit devices: Three (3) years.
5. All other hardware: Two (2) years.

1.07 MAINTENANCE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Item	Manufacturer	Acceptable Substitutes
Hinges	Ives	Hager, Stanley, McKinney
Locks, Latches & Cylinders	Schlage	Or Approved Equal

Exit Devices	Von Duprin	Or Approved Equal
Closers	LCN	Or Approved Equal
Push, Pulls & Protection Plates	Ives	Trimco, BBW, DCI
Flush Bolts	Ives	Trimco, BBW, DCI
Dust Proof Strikes	Ives	Trimco, BBW, DCI
Coordinators	Ives	Trimco, BBW, DCI
Stops	Ives	Trimco, BBW, DCI
Overhead Stops	Glynn-Johnson	Or Approved Equal
Thresholds	Zero	Pemko, National Guard
Seals & Bottoms	Zero	Pemko, National Guard

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2.02 MATERIALS

DESIGNERS!! Hardware listed below is District standard for non-electrified, non-access controlled locksets. You are required to provide hardware groups per specific opening requirements utilizing these hardware components. Delete this statement prior to issuance.

A. Hinges: Ives as scheduled.

1. ~~Ives5BB1HW x NRP (Heavy use exterior doors) 630 finish.~~
   Ives 5BB1HW (Interior doors) ~~652~~ 630 finish.

2. Hinges shall be sized in accordance with the following:
   a. Height:
      1) Doors up to 42" wide: 4-1/2" inches.
      2) Doors 43" to 48" wide: 5 inches.
   b. Width: Sufficient to clear frame and trim when door swings 180 degrees.
   c. Number of Hinges: Furnish 3 hinges per leaf to 7'-5" in height. Add one for each additional 2 feet in height.

3. Exterior out-swinging door butts shall be non-ferrous material and shall have stainless steel hinge pins. All doors to have non-rising pins.

4. Furnish non-removable pins (NRP) at all exterior out-swing doors and interior key lock doors with reverse bevels.

B. Continuous Hinges: Ives as scheduled.

1. SL-224HD (EHeavy use exterior doors & Remodels) 628 finish.

C. Heavy Duty Cylindrical Locks and Latches: Schlage "ND" Series as scheduled with "Rhodes" design, fastened with through-bolts and threaded chassis hubs.

1. Bathroom (Student – multi use) ND94
2. Faculty ND94
3. Administration ND91
4. Communicating ND72VandlegardXN12-003
5. Classroom Safe School Lock ND98
6. Bathroom (Typical) ND94
7. Janitor / Storage room ND96
8. Bathroom (Faculty - single compartment toilet) L9485 x 06A x L283-722with XL13-439
9. Bathroom (Faculty and Student please consult)

10. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
    a. Abusive Locked Lever Torque Test – minimum 3,100 inch-pounds without gaining access
    b. Offset lever pull – minimum 1,600-foot pounds without gaining access
    c. Vertical lever impact – minimum 100 impacts without gaining access

11. Cycle life - tested to minimum 16 million cycles per ANSI/BHMA A156.2 Cycle Test with no visible lever sag or use of performance aids such as set screws or spacers
12. Cylinders: Refer to "KEYING" article, herein.
13. Provide solid steel anti-rotation through bolts and posts to control excessive rotation of lever.
14. Provide lockset that allows lock function to be changed to over twenty other common functions by swapping easily accessible parts.
15. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
16. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
17. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
18. Provide wired electrified options as scheduled in the hardware sets.
    a. 12 through 24-volt DC operating capability, auto-detecting
    b. Selectable EL (fail safe)/EU (fail secure) operating mode via switch on chassis
    c. 0.230A (230mA) maximum current draw
    d. 0.010A (10mA) holding current
    e. Modular / "plug in" request to exit switch

18. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.

D. Exit devices: Von Duprin as scheduled.

1. CD98L-AX-996L-KC (Single Door) 626 finish
2. CD98L-AX-996L-KC x CD98DT x KR4954 Mullion x 154 (Pairs) 626 finish
3. 98L-AX-2-F-996L (F Rated Single Door) 626 finish

4. 98L-AX-2-F-996L x 2 KR9954 Mullion 154(F Rated Pairs) 626 finish
   a. No vertical rods allowed.
   b. Use -2 Function to meet AB 211.
   c. MT54 Mullion Storage at Pairs.
   d. Provide 154 stabilizers at all mullions.

5. Provide certificate by independent testing laboratory that device has completed over 1,000,000 cycles and can still meet ANSI/BHMA A156.3 - 2001 standards.
6. All internal parts shall be of cold-rolled steel with zinc dichromate coating.
5. Non-handed basic device design with center case interchangeable with all functions.
6. All devices shall have quiet return fluid dampeners.
7. All latch bolts shall be deadlocking with ¾" throw and have a self-lubricating coating to reduce friction and wear.
8. Device shall bear UL label for fire and or panic as may be required.
9. All surface strikes shall be roller type and utilize a plate underneath to prevent movement.
10. Lever Trim: "Breakaway" design, forged brass or bronze escutcheon with a minimum of .130" thickness, match lockset lever design.
11. Removable Mullions: Removable with single turn of building key. Securely reinstalled without need for key.
    a. MT54 Mullion Storage at Pairs

12. Furnish glass bead kits for vision lites where required.
13. All Exit Devices to be sex-bolted to the doors.
14. Panic Hardware shall comply with CBC Section 11B-~~-~~404.2.7 and shall be mounted between 34" and 44" above the finished floor surface.
    a. The unlatching force shall not exceed 15 lbs. applied in the direction of travel.

-OR-

    b. Provide exit devices UL certified to meet maximum 5-pound requirements according to the California Building Code section 11B-309.4, and UL listed for Panic Exterior Fire Exit Hardware.

Commented [JR1]: Same same

Commented [JR2]: Same same

E. Closers: LCN as scheduled. Place closers inside building, stairs, room, etc.

1. P4041XP 689 finish
   a. Hold open arms or cush closers are not allowed.

2. Door closer cylinders shall be of high strength cast iron construction with double heat-treated pinion shaft to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
3. All door closers shall be fully hydraulic and have full rack and pinion action with a shaft diameter of a minimum of 11/16 inch and piston diameter of 1 inch to ensure longevity and durability under all closer applications.
4. All parallel arm closers shall incorporate one-piece solid forged steel arms with bronze bushings. 1-9/16" steel stud shoulder bolts, shall be incorporated in regular arms, hold-open arms, arms

with hold open and stop built in. All other closers to have forged steel main arms for strength, durability, and aesthetics for versatility of trim accommodation, high strength and long life.

5. All parallel arm closers so detailed shall provide advanced backcheck for doors subject to severe abuse or extreme wind conditions. This advanced backcheck shall be located to begin cushioning the opening swing of the door at approximately 45 degrees. The intensity of the backcheck shall be fully adjustable by tamper resistant non-critical screw valve.
6. Closers shall be installed to permit doors to swing 180 degrees.
7. All closers shall utilize a stable fluid withstanding temperature range of 120 degrees F. to -30 degrees F. without requiring seasonal adjustment of closer speed to properly close the door.
8. Provide the manufactures drop plates, brackets and spacers as required at narrow head rails and special frame conditions. NO wood plates or spacers will be allowed. Door frames shall be reinforced at all mounting locations.
9. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above standards. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs. when specifically approved by fire marshal. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. Per 11B- 404.2.8.1, door shall take at least 5 seconds to move from an open position of 90 degrees to a position of 12 degrees from the latch jamb.

F. Flush Bolts & Dust Proof Strikes: Ives as scheduled.

1. FB51 (Manual) (metal doors) (Storage & Utility rooms) 626 finish
2. FB61P (Manual) (wood doors) (Storage & Utility rooms) 626 finish
   a. Manual flush bolts only permitted on storage or mechanical openings as scheduled.
   b. Provide dust proof strikes at openings using bottom bolts.
   c. Automatic flush bolts allowed only where required by Fire Code.

G. Door Stops: Ives as scheduled.

1. FS18S (Exterior Floor) 626 finish
2. FS 436/438 (Interior Floor) 626 finish
3. WS 406CVX (Wall) 626 finish
4. WS406CCV (Inswing push-button locks) 626 finish
   a. Allow for maximum swing of doors
   b. Backing required at wall holders

5. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type.
6. Do not install floor stops more than four (4) inches from the face of the wall or partition (CBC Section 11B-307).
7. Overhead stops shall be made of stainless steel and non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.

H. Door Holders: Ives as scheduled.

1. WS452-4 Series Automatic Holder (Door) 626 finish
2. FS40 Series Automatic Holder (Wall) 626 finish
   a. Backing required at wall holders
   b. Allow for maximum door swing

I. Protection Plates: Ives as scheduled.

1. Kick Plate: 8400-10” x 2” LDW 630 finish
2. Mop Plate: 8400-5” x 2” LDW 630 finish
3. Push / Pull Plate: 8200 x 8302-6x 4x16 630 finish
4. Lock Protector: ~~LP~~LG-13, ~~LP~~LG-12 626 finish
5. Fabricate either kick, armor, or mop plates with four beveled edges. Provide kick plates 10" high and 2" LDW. Sizes of armor and mop plates shall be listed in the Hardware Schedule. Furnish with machine or wood screws of bronze or stainless to match other hardware.

J. Thresholds: As Scheduled and per details.

1. Thresholds shall not exceed 1/2" in height, with a beveled surface of 1:2 maximum slope.
2. Set thresholds in a full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements in Division 7 “Thermal and Moisture Protection”.
3. Use ¼” fasteners, red-head flat-head sleeve anchors (SS/FHSL).
4. Thresholds shall comply with CBC Section 11B-404.2.5.

K. Seals and Surface Applied Hardware: Zero as scheduled.

1. Smoke Seal:488S-BK Black
2. Weather Seal: 488S-BK 628 finish

-and-

8780N Factory

3. Door Sweep: 328AA 689 finish
4 139SS (Wood doors) (Use only where required by fire code) 630
   a. Astragal by door manufacturer at HM door
5. Drip Guard: 17D x 4” PDW (Exterior doors exposed to rain) 628
6. Door Bottom: Use automatic door bottoms only if required by code.
7. Provide silicone gasket at all rated and exterior doors.
8. Fire-rated Doors, Resilient Seals: UL10C Classified complies with NFPA 80 & NFPA 252. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements.
9. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C Classified complies with NFPA 80 & NFPA 252. Where required, intumescent seals vary in requirement by door type and door manufacture -- careful coordination required.
10. Smoke & Draft Control Doors, Provide UL10C Classified complies with NFPA 80 & NFPA 252 for use on “S” labeled Positive Pressure door assemblies.

L. Door Shoes & Door Top Caps: Provide door shoes at all exterior wood doors and top caps at all exterior out-swing doors.

M. Silencers: Ives as scheduled.

1. 654A, 655A, 623A Black
2. Furnish silencers for interior hollow metal frames, 3 for single doors, 2 for pairs of doors. Omit where sound or light seals occurs, or for fire-resistive-rated door assemblies.

N. Keying: Schlage as scheduled.

1. Furnish a Proprietary Schlage master key system as directed by the owner or architect. Key system to be designated and combination-d by the Schlage Master Key Department even if pinned by the Authorized Key Center, Authorized Security Center or a local authorized commercial dealer. This is to be a Schlage PrimusXP "Classic" keying system. SCUSD to verify all keyways. Provide as follows:
   a. 6 pin x Standard Core plug (ND Series) 626 finish
   b. 6 pin x Rim type x IC Core (Exit Device) 626 finish
   c. 6 pin x 1-1/4" Mortise x IC Core (KR Mullions and CD) 626 finish
2. A detailed keying schedule is to be prepared by the owner and/or architect in consultation with a representative of Allegion or an Authorized Key Center or Authorized Security Center. Each keyed cylinder on every keyed lock is to be listed separately showing the door #, key group (in BHMA terminology), cylinder type, finish and location on the door.
3. Establish a new master key system for this project as directed by the keying schedule.
4. Furnish all cylinders in the Schlage conventional style except the exit device and removable mullion cylinders which will be supplied in Schlage Full Size Interchangeable Core (FSIC). Pack change keys independently (PKI).
5. Furnish PrimusXP "Classic" keyway Patent Protected Schlage cylinders where noted. Furnish all other cylinders in matching conventional "Classic" keyway. Furnish Patent Protected Schlage keys for all cylinders. (e.g., Primus XP Classic Keyway for patent protected / Maximum control) (with mix of conventional "Classic" keyway)
6. Furnish construction keying for doors requiring locking during construction.
   a. For FSIC systems provide 23-030-ICX Full Size Construction Cores
   b. For FSIC systems provide ten 48-101-ICX Construction Keys
   c. For FSIC systems provide two 48-056-ICX Control Keys (const.)
   d. For FSIC systems provide two control keys for installing the permanent cores (49- 056 for "Classic" keyways, 48-052-XP for "Classic Primus").

-OR-

7. Furnish construction keying for doors requiring locking during construction.
   a. For "Split Key" Construction Cylinders (non-IC cylinders) specify "CK" for each keyed cylinder.
   b. Provide ten Construction Keys (48-104 "Classic")
   c. Provide two Extractor Tools (35-057)
8. Furnish all keys with visual key control.

a. Stamp key “Do Not Duplicate”.

9. Furnish mechanical keys as follows:
   a. Furnish 2 cut change keys for each different change key code.
   b. Furnish 1 uncut key blank for each change key code.
   c. Furnish 6 cut master keys for each different master key set.
   d. Furnish 3 uncut key blanks for each master key set.
   e. Furnish 2 cut control keys cut to the top master key for permanent I/C cylinders.
   f. Furnish 1 cut control key cut to each SKD combination.
   g. Furnish KS43D2200 padlock for use with non-I/C Schlage cylinders. Furnish 47- 413 (conventional) or 47-743-XP (PrimusXP) with above.
   h. Furnish KS43G3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (Classic) or 20-740 (PrimusXP) with above.
   i. Furnish KS41D1200 padlock for use with FSIC Schlage cylinders.

10. Furnish Schlage Padlocks and the cylinders to tie them into the master key system for gates, storage boxes, utility valve security, roof hatches and roll-up doors keyed as directed in the keying schedule.
    a. Furnish KS43D2200 padlock for use with non-I/C Schlage cylinders. Furnish 47- 413 (conventional) or 47-743-XP (PrimusXP) with above.
    b. Furnish KS43G3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (Classic) or 20-740 (PrimusXP) with above.
    c. Furnish KS41D1200 padlock for use with SFIC Schlage cylinders.

O. Fasteners

1. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal and standard wood screws for wood.
2. Screws for butt hinges shall be flathead, countersunk, full-thread type.
3. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.
4. Provide expansion anchors for attaching hardware items to concrete or masonry.
5. All exposed fasteners shall have a Phillips head.
6. Finish of exposed screws to match surface finish of hardware or other adjacent work.
7. All Exit Devices and Lock Protectors shall be fastened to the door by the means of sex bolts or through bolts.

2.04 FINISHES

A. Generally, to be satin chrome US26D (626 on bronze and 652 on steel) unless otherwise noted.

B. Furnish push plates, pull plates and kick or armor plates in satin stainless steel US32D (630) unless otherwise noted.

C. Door closers shall be powder-coated to match other hardware, unless otherwise noted.

D. Aluminum items to be finished anodized aluminum except thresholds which can be furnished as standard mill finish.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that doors and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

C. Fire-Rated Door Assembly Inspection: Upon completion of the installation, all fire door assemblies shall be inspected to confirm proper operation of the closing device and latching device and that only the manufacturer's furnished fasteners are used for installation and that it meets all criteria of a fire door assembly per NFPA 80 (Standard for Fire Doors and Other Opening Protectives) A written record shall be maintained and transmitted to the Owner to be made available to the Authority Having Jurisdiction (AHJ). The inspection of the swinging fire doors shall be performed by a certified FDAI (Fire Door Assembly Inspector) with knowledge and understanding of the operating components of the type of door being subjected to the inspection. The record shall list each fire door assembly throughout the project and include each door number, an itemized list of hardware set components at each door opening, and each door location in the facility.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.

B. Use the templates provided by hardware item manufacturer.

C. Mounting heights for hardware shall be as recommended by the Door and Hardware Institute. Operating hardware will to be located between 34" and 44" AFF.

D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set thresholds for exterior doors in full bed of butyl-rubber sealant.

G. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.

H. Hardware Installer shall coordinate with security contractor to route cable to connect electrified locks, panic hardware and fire exit hardware to power transfers or electric hinges at the time these items are installed so as to avoid disassembly and reinstallation of hardware.

I. Hardware Installer shall also be present with the security contractor when the power is turned on for the testing of the electronic hardware applications. Installer shall make adjustments to solenoids, latches, vertical rods and closers to insure proper and secure operation.

J. All wiring for electro-mechanical hardware mounted on the door shall be connected through the power transfer and terminated in the interface junction box specified for in the Electrical Section.

K. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.

L. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer's technical documentation.

J. Hardware Locations

1. Conform to CCR, Title 24, Part 2; and ADAAG; and the drawings for access-compliant positioning requirements for the disabled.

3.03 ADJUSTING AND CLEANING

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surface soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project and re-adjust every item of hardware to restore proper functions of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace

hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.05 FIELD QUALITY CONTROL

A. Contractor is responsible for providing the services of an Architectural Hardware Consultant (AHC) or a proprietary product technician to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturers' instructions and as specified herein.

3.06 SCHEDULE

A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.

B. While the hardware schedule is intended to cover all doors, and other movable parts of the building, and establish type and standard of quality, the contractor is responsible for examining the Plans and Specifications and furnishing proper hardware for all openings whether listed or not. If there are any omissions in hardware groups in regard to regular doors they shall be called to the attention of the Architect prior to bid opening for instruction; otherwise, list will be considered Complete. No extras will be allowed for omissions.

C. The Door Schedule on the Drawings indicates which hardware set is used with each door.

Manufacturers Abbreviations (Mfr.)

GLY	=	Glynn-Johnson Corporation	Overhead Door Stops
IVE	=	Ives	Hinges, Pivots, Bolts, Coordinators, Dust Proof Strikes, Push Pull & Kick Plates, Door Stops & Silencers
LCN	=	LCN	Door Closers
SCE	=	Schlage Electronics	Electronic Door Components
SCH	=	Schlage Lock Company	Locks, Latches & Cylinders
VON	=	Von Duprin	Exit Devices
ZER	=	Zero International	Thresholds, Gasketing & Weather-stripping

Designers!! Example group shown below is for order of hardware pieces only. Designer shall build each hardware group for each door type needed on individual projects.

HARDWARE GROUP NO. 00X – LOCATION/FUCTION TYPE
DOOR NUMBERS – (AS REQUIRED)

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1 EA	CONT. HINGE	MODEL #	628	IVE
1 EA	POWER TRANSFER	MODEL #	689	VON
1 EA	ELEC OFFICE LOCK	MODEL #	626	SCE

			VDC (PROVIDED BY DIVISION 28)		
1	EA	PRIMUS K-I-L CYL.	AS REQUIRED	626	SCH
1	EA	CLOSER	MODEL #	689	LCN
1	EA	LOCK GUARD	MODEL #	630	IVE
1	EA	KICK PLATE	MODEL #	630	IVE
1	EA	FLOOR STOP	MODEL #	BLK	IVE
1	EA	DOOR SWEEP	MODEL #	AA	ZER
1	EA	GASKETING	MODEL #	BK	ZER
1	EA	THRESHOLD	PER DETAIL	AL	ZER

END OF SECTION

REVISION SUMMARY

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When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

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All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- None at this time.

SECTION 08 90 00

METAL WALL LOUVERS

PART 1 – GENERAL

1.01 SUMMARY

A. Work Included

1. Fixed Blade Metal Wall Louvers.
2. Screening.

B. Related Work
1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 00 72 00: General Conditions.
3. Section 06 10 00: Rough Carpentry: Framed Openings.
4. Section 07 62 00: Sheet Metal Flashing and Trim.
5. Section 07 90 00: Joint Sealers.
6. Section 09 90 00: Painting.

1.02 REFERENCES

A. AMCA 501 (Air Movement Council Association) Application Manual for Air Louvers.

B. AMCA 502 (Air Movement Council Association) Damper Application Manual for Heating, Ventilating and Air Conditioning.

C. ANSI/ASTM A653 ~~/ A653M~~ -25 Steel Sheet, Zinc Coated (galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the hot-dip process.

1.03 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacture of AMCA certified louvers with three years' experience.

1.04 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 00 72 00.

B. Indicate on shop drawings layout, elevations, dimensions, and tolerances; head, jamb, and sill details; blade configuration; screening; and frames.

C. Submit manufacturer's installation instructions under provisions of Section 00 72 00.

D. Samples: Submit (2) two 6" x 6" samples of selected finish color.

1.06 COORDINATION

A. Coordinate work of this Section with installation of flashings and exterior finish system.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - WALL LOUVERS

A. Wonder Metals Corporation, model #L-445.

B. The Airolite Company.

C. Construction Specialties, Inc.

D. Substitutions: Under provisions of Section 00 72 00.

2.02 MATERIALS

A. Louver blades, head, jamb, and sill: 18 ga. galvanized steel.

B. Fasteners and Anchors: Stainless steel type or as recommended by manufacturer.

2.03 ACCESSORIES

A. Flashings: Of same material as louver frame.

B. Insert screen and frame: Galvanized steel frame with 18 x 14 galvanized insect mesh, fabricated by louver manufacturer. Install on interior side of louver.

C. Sealants: specified in Section 07 90 00.

2.04 FABRICATION

A. Louver Size: 4 inches deep, face measurements as indicated. Nominal free area opening of 45%.

B. Louver Type: Continuous with fixed, storm proof blades.

C. Head and Sill Members: Roll formed to required shape, one piece per location.

D. All welded construction.

E. Screens: Screw to louver frame.

2.05 FINISHES

A. Factory primed for field paint finish.

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify that prepared openings and flashings are ready to receive work and opening dimensions are as indicated on shop drawings.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install louver assembly in accordance with manufacturer's instructions.

B. Install louvers level and plumb.

C. Secure louvers in opening framing with concealed fasteners.

D. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.

E. Install perimeter sealant in accordance with Section 07 90 00.

3.03 CLEANING

A. Clean surfaces and components.

END OF SECTION

SECTION 09 22 00

METAL LATH AND PORTLAND CEMENT PLASTER

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Metal furring and lathing.

B. Three-coat Portland cement plaster system with integral color stucco finish coat.

C. Patching of interior plaster, with smooth finish coat.

1.02 RELATED SECTIONS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

B. Section 09 91 00: Painting.

1.03 REFERENCES

A. ANSI/ASTM C1063-16c - Installation of Lathing and Furring to Receive Interior and Exterior for Portland Cement-Based Plaster.

B. ANSI/ASTM C91 / C91M-12 - Masonry Cement.

C. ASTM C150 / C150M-16e1 - Portland Cement.

D. ANSI/ASTM C206-14 - Finishing Hydrated Lime.

E. ASTM C847-14a - Metal Lath.

F. ANSI/ASTM C897-15 - Aggregate for Job-Mixed Portland Cement-Based Plasters.

G. ANSI/ASTM C926-16b - Application of Portland Cement-Based Plaster.

H. FS-UU-B-790 - Building Paper, Vegetable Fiber (kraft, waterproofed, water repellant and fire resistant).

1.04 QUALITY ASSURANCE

A. Applicator: Company specializing in cement plaster work with five years experience.

B. Apply cement plaster in accordance with ASTM C926 and CBC Chapter 25.

1.05 SUBMITTALS

A. Submit product data under provisions of Division 0 & 1.

B. Provide product data on furring and lathing components, plaster materials, characteristics and limitations of products specified, and plastering accessories.

C. Submit manufacturer's installation instructions under provisions of Section 00 72 00.

D. Submit color charts for selection of integral color finish coat from manufacture’s standard range of a minimum of twelve colors. (Note that the plaster is also required to be painted under Section 09 91 00).

E. Submit sample of selected color and texture to match existing finish.

F. Provide shop drawings of exterior elevations showing all proposed vertical and horizontal expansion joints.

1.06 PRODUCT HANDLING

A. Delivery, storage, and handling in accordance with provisions of Section 00 72 00.

1. Deliver manufactured products to job site in their original unopened containers with labels intact and legible at the time of use.

2. Do not permit scattering of materials or equipment but use necessary means to always ensure neatness of the site and structure.

3. Perform cleaning of tools and equipment only in the area designated for that purpose.

B. Protection: Use means necessary to protect lath and plaster materials before, during and after installation and to protect the installed work and materials of other trades.

C. Replacements: In the event of damage, immediately make repairs and replacements necessary to the approval of the Architect and at no additional cost to Owner.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Do not apply plaster when substrate or ambient air temperature is less than 50 degrees F. nor more than 90 degrees F. If freezing is expected, do not apply plaster beyond period of day necessary for hydration.

B. Maintain minimum ambient temperature of 50 degrees F. during and after installation of plaster.

C. Protect plaster from uneven and excessive evaporation during any weather.

PART 2 – PRODUCTS

2.01 PLASTER MATERIALS

A. Cement: ASTM C150, Normal - Type I, low alkali; grey color; Portland Cement.

B. Admixture: PRF Admixture as manufactured by Gibco, Inc.

C. Aggregate: In accordance with ANSI/ASTM C897-05 (latest edition), except that gradation shall meet the following requirements:

Sieve Size	Percent Retained on each sieve (by weight)	
	Maximum	Minimum
No. 4	0	-
No. 8	10	0
No. 16	40	10
No. 30	65	30
No. 50	90	70
No. 100	100	90-95

1. The sand should not have more than 50% retained between any two consecutive sieves nor more than 25% between Nos. 50 and 100 sieves.

D. Water: Clean, fresh, potable, and free of mineral or organic matter which can affect plaster.

E. Pre-Mixed Finish Coat (Stucco): Acrylic modified water-repellent Portland cement base with integral color prepared in accordance with specifications of the Finish Coat Manufacturer. Acceptable Manufacturers: Peerless Stucco, La Habra, or approved equal. Texture to match existing. Color as selected by Architect from Manufacturer's standard range of a minimum of twelve colors.

F. Acrylic Modifier for Finish Coat: as manufactured by Finish Coat Manufacturer.

2.02 FURRING AND LATHING MATERIALS

A. General: All metal to be galvanized steel or zinc alloy.

B. Metal Lath: Hot dipped galvanized, ASTM A653 / A653M, G60 coating designation for use over solid substrate. Provide and install self-furring lath and furring nails.

C. Expanded Metal Lath: ASTM C847.

1. Vertical Walls: Self-furring diamond mesh weighing 3.4 pounds per square yard, attachments every six inches on center at furring points. Insure self-furring ribs have not been collapsed during shipping and installation. Lath must maintain a ¼ inch clearance from substrate.

2. Horizontal Areas: 3.4 lath with supports 16 inches on center or less is preferred or a

proprietary woven wire specially made for ceilings or soffits can be used.

D. Building Paper: FS-UU-B-790, Style 2, Grade D.

E. Fasteners: Provide types and sizes required in CBC, 2022 Edition, Table 2507.2. Lath on solid substrates to be attached with furring nails.

F. Metal Accessories: General: Minimum 26-gauge galvanized steel or zinc alloy, perforated or expanded flanges as manufactured by Clark Dietrich, USG, Keene/Metelex or approved equal. Use longest possible length; sized and profiled to suit application. Other special products, shapes and sizes as identified in the drawings.

1. Corner Reinforcement: Clark Dietrich Wire Corner Reinforcement.

2. Casing Beads: Clark Dietrich No. 66N square edge.

3. Expansion Screed: Accordion profile: Clark Dietrich #XJ15 unless special shapes are detailed.

4. Sill Screed: Clark Dietrich No. FHA-7 Foundation sill screed.

5. Soffit Vent Screed: Clark Dietrich, 26 GA., perforated soffit vent of profile indicated.

6. Corner Reinforcement: Cornerite, minimum 1.75-pounds per square yard expanded metal lath with minimum 2-inch legs.

7. Strip Reinforcement: For reinforcing joints of dissimilar materials and diagonal reinforcement at opening corners, minimum 1.75-pounds per square yard.

8. Woven Glass Fiber Fabric:
a. 10x10 Leno Woven – Resin Coated Glass, white, 36 inches by 150 feet, Stock #FDW6878-U.
b. StoGuard Mech 4.25 inch or 9.5-inch, 5 oz. weight, 150-foot length.

9. Tape: Acrylic adhesive backed oriented polypropylene, 3 inch in width.

2.03 CEMENT PLASTER MIXES

A. Mix and proportion cement plaster as follows:

1. Scratch coat proportions: One-part Portland cement, 4 parts aggregate and 3-ounce PRF admixture. Provide glass fiber reinforcing fibers equal to Fibermesh 150-e3 as manufactured by Propex in quantities as recommended by manufacturer to control cracking.

2. Brown coat proportions: One-part Portland cement, 5 parts aggregate, and 3 ounces PRF admixture.

B. Mix only as much plaster as can be used in one hour.

C. Mix materials dry, to uniform color and consistency, before adding water.

D. Protect mixtures from frost, contamination, and evaporation.

E. Do not retemper mixes after initial set has occurred.

2.04 PATCHING MATERIAL

A. 2" wide self-adhering nylon tape.

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify that surfaces and site conditions are ready to receive work.

B. Inspect the installed work of other trades and verify that such work is complete to the point work of this section may begin.

C. Verify that substrates to receive lath shall be straight and true to line within 1⁄4 in. in 10 ft. to receive the specified plaster thickness. (This verbiage is more in line with what code requirements are.)

A. Report in writing conditions which might adversely affect the performance of installed lath and plaster to the General Contractor with a copy to the Architect.

B. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

A. Protect surfaces near the work of this Section from damage or disfiguration.

B. Saw cut back all existing plaster, careful not to damage existing building paper, to accommodate 6” lap with new building paper.

3.03 INSTALLATION - LATHING MATERIALS

A. Install metal plaster bases and accessories in conformance with CBC, 2022 Edition, Section 2507 and ANSI C1063.

B. Apply two layers of building paper underlayment, weatherlap edges 2 inches minimum horizontal and 6 inches minimum vertical laps. Continue building paper minimum 6 inches around inside and outside corners.

C. Attach lath to wood supports using nails at maximum six inches on center.

D. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches from corner to form the angle reinforcement. Fasten at perimeter edges only.

E. Place external angle with mesh at corners. Fasten at outer edges only.

F. Place strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

G. Place 4-inch-wide strips of glass fiber mesh over scratch coat centered on point of corner at doors, windows, recesses, and other angular openings in building wall. Extend minimum 8 inches diagonally from point of corner. When this occurs metal strips of lath are not needed.

H. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.

I. Install accessories to lines and levels.

J. Install expansion screeds over all building joints and at intervals recommended by the Technical Services Information Bureau, and where shown.

K. Locate exterior control and expansion joints as indicated on drawings but not to exceed 12’-0” o.c. horizontally or vertically.

L. Attach control and expansion joints to metal lath with wire ties.

M. Install expansion joint over 3-inch-wide strip of polypropylene tape to assist with air seal continuity.

Cut metal lath behind expansion and control joints. Double studs at all joints. Lath to be nailed on either side of cut lath.

3.04 PLASTERING

A. General: When complete, plaster surfaces shall be flat, true to plane, free from defects and shall be uniform in texture.

B. Apply plaster in accordance with ASTM C926.

C. Apply scratch coat to a nominal thickness of 3/8 inch over metal reinforcement. Cover metal reinforcement.

1. After application, lightly score scratch coat horizontally.

2. If brown coat cannot be applied within 4 hours, keep scratch coat moist for 48 hours.

D. Apply brown coat to a nominal thickness of 3/8 inch over scratch coat. Rod brown coat straight

and true in all directions.

E. Moist cure brown coat for minimum 14 days. Areas shall be thoroughly moistened by use of a fine mist at a minimum of three times daily and as may be required due to weather conditions, per the Services Information Bureau. recommendations.

3.05 STUCCO FINISH

A. Dampen brown coat evenly before applying finish coat.

B. Mix integrally colored manufactured stucco finish with solution of 1-part acrylic modifier and 3 parts water. Use only sufficient solution to produce plastic mortar. Apply entire panels of finish coat without joints with necessary joints occurring at natural breaking points and control joints.

C. Apply machine applied finish coat approximately 1/8-inch thickness.

D. Texture: Medium dash coat finish to best match existing.

3.06 STUCCO PATCHING AT WALL CRACKS

A. Scrape existing finish smooth a minimum of 4" on each side of crack. Acid wash areas stained due to water damage.

B. Apply nylon tape over full length of crack.

C. Apply bonding agent over entire area to receive new finish coat of stucco.

D. Apply stucco finish coat over area, matching existing. Extend evenly into existing wall finish.

3.07 TOLERANCES

A. Maximum Variation from True Flatness: ¼” in 10 feet, properly meeting adjacent surfaces and materials.

3.08 CLEANING

A. Remove plaster and protective materials from control and expansion joints, perimeter beads and adjacent surfaces. Remove stains that would adversely affect subsequent finishes on plaster.

END OF SECTION

REVISION SUMMARY

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All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- Do not use a Level 5 smooth finish for new work. Provide a Level 4 with light orange peel at all visible surfaces.
- Coordinate with installation of other finishes for minimum gypsum board finish levels.
- Interior walls/partitions shall comply with *ANSI/ASA S12.60-2010/Part 1 Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools* for Minimum STC Rating requirements for assemblies between adjacent spaces (Table excerpt from guideline on following page).

TABLE 4 – Minimum STC ratings required for single or composite wall and floor-ceiling assemblies that separate a core learning space from an adjacent space.

ADJACENT SPACE			
Other enclosed or open-plan core learning space, therapy room, health care room and space requiring a high degree of acoustical privacy [a,b]	Common-use and public-use toilet room and bathing room [a]	Corridor, staircase, office, or conference room [c,d]	Music room, music performance space, auditorium, mechanical equipment room, [e] cafeteria, gymnasium or indoor swimming pool.
50	53	45	60

a) These requirements do not apply to toilets opening only into the core learning space and used only by occupants of the core learning space.
b) A 20 cm (8”) concrete masonry unit wall having a surface weight density of at least 180 kg/m 2 painted and sealed on both sides, acoustically sealed at the entire perimeter and extending from the floor slab to the structural deck above, is an acceptable alternate assembly that conforms to the intent of 5.4.2.1.
c) For corridor, office, or conference room walls containing doors, the basic wall, exclusive of the door, shall have an STC rating as shown in the appropriate column in this table. The entrance door shall conform to the requirements of 5.4.2.4.
d) When acoustical privacy is required, the minimum composite STC rating, including the effects of doors, of the partitions around an office or conference room, shall be increased to 50.
e) The isolation between core learning spaces and mechanical equipment rooms shall have a STC rating of 60 or greater unless it is shown that the sound level in the mechanical equipment room combined with a lower STC rating can achieve the required sound level in the core learning space. In no case shall the design STC between such spaces be less than 45.

SECTION 09 30 13
CERAMIC TILE WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Ceramic wall and base tile using the thin-set application method per TCA W242 U.O.N.

1.02 RELATED SECTIONS

A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 07 90 00: Joint Sealers.

C. Section 09 21 16: Gypsum Board Systems.

D. Section 09 67 00: Urethane Concrete Flooring System.

E. Section 10 26 00: Wall Protection.

1.03 REFERENCES

A. ANSI/TCA A118.4 - Latex-Portland Cement Mortar.

B. ANSI/TCA A137.1 - Specifications for Ceramic Tile.

C. TCA (Tile Council of America) - Handbook for Ceramic Tile Installation.

D. ASTM C144-11 - Aggregate for Masonry Mortar.

E. ASTM C150 /C150M-16e1 - Portland Cement.

F. ISO 13007 - Standards for ceramic tiles, grouts and adhesives.

1.04 SUBMITTALS

A. Submit per the requirements of the General Conditions.

B. Submit shop drawings indicating tile layout, perimeter conditions, junctions with dissimilar materials, thresholds, and setting details.

C. Submit product data under provisions of the General Conditions.

D. Submit product data indicating material specifications, characteristics, and instructions for using adhesives and grouts.

E. Submit samples under provisions of the General Conditions. Provide existing tile sample with new sample for comparison at patch repair work.

F. Submit manufacturer's installation instructions under provisions of Division 0, General Conditions.

G. Submit maintenance data under provisions of Division 0, General Conditions.

H. Include recommended cleaning and stain removal methods, and cleaning materials.

1.05 QUALITY ASSURANCE

A. Conform to ANSI/TCA A137.1

B. Conform to TCA Handbook for Ceramic Tile Installation, latest edition.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum three years of experience.

B. Installer: Company specializing in applying the work of this Section with minimum three (3) years of experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of the General Conditions.

B. Store and protect products under provisions of the General Conditions.

C. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives in a closed, unventilated environment.

B. Maintain 50 degrees F during installation of mortar materials.

PART 2 – PRODUCTS

2.01 MANUFACTURERS - TILE

A. DAL-TILE (specified).

B. AMERICAN OLEAN.

C. Approved equal meeting all material, size and color criterial specified herein.

2.02 TILE MATERIAL

A. **Type CT-1**, All Areas: Ceramic Wall Tile including Accent Colors: ANSI/TCA A137.1, conforming to the following:

Mfr. Line:	**Daltile Classic Color Wheel Collection – Glazed Ceramic Wall Tile**
Size:	4” x 4” x ¼” and corresponding profiles.
Edge:	Cushioned.
Shapes:	Provide all interior and exterior corners and bullnose ends pieces as required for a complete installation. Provide cove base profiles where integral epoxy floor base is not scheduled.
Surface Finish:	Semi-Gloss and/or Matte Glazed, Smooth.
Colors:	Allow for 1 field color and up to 5 accent color as selected by Architect from Manufacturer’s full range of standard and premium colors from specified product line at time of submittal. See drawings for pattern layouts where occur.

2.03 ADHESIVE MATERIALS

A. Latex White Multi-Mastic Type 2 (Laticrete 15) for walls, ANSI A136.1.

B. MAPEI, Type 1 Mastic-ANSI A136.1 and ISO 13007; DT1E.

C. Ardex D-14.

2.04 GROUT MATERIALS

A. Wall Grout: 100% solids epoxy, Laticrete SpectraLock 2000 IG or Laticrete SpectraLOCK PRO Grout. Color to be selected by Architect at time of submittal from manufacturer’s full range of standard colors. Allow for different grout colors in different rooms.

B. MAPEI; Kerapoxy - ANSI A118.3 and ISO 13007; RG.

2.05 GROUT MIX

A. Mix and proportion pre-mix grout materials in accordance with manufacturer's instructions. Grout shall be manufactured by Laticrete International, Inc. Colors as selected by Architect.

2.06 ACCESSORIES

A. Cleavage Membrane: ASTM C226 No. 15 asphalt saturated felt or ASTM C171 4 mil. thick polyethylene film.

B. Reinforcing Mesh: 2x2 inch size weave of 16/16 wire size; welded fabric, galvanized. Conform to ASTM A82 & A185.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive Work.

B. Beginning of installation means installer accepts condition of existing substrate.

3.02 PREPARATION

A. Protect surrounding work from damage or disfiguration.

B. Vacuum clean existing substrate and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Apply sealer to surfaces as recommended by adhesive manufacturer.

3.03 INSTALLATION

A. Install all tile in accordance with TCA Handbook, latest edition, for Ceramic Tile Installation.

B. Request tile pattern from Architect if not shown on Drawings. Do not interrupt tile pattern through openings.

C. Cut and fit tile tight to penetrations through tile and provide caulk joint. Form corners and bases neatly. Align floor, base, and wall joints.

D. Place tile joints uniform in width. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

E. Sound tiles after setting and replace any hollow units.

F. Allow tile to set for a minimum of 48 hours prior to grouting.

G. Provide control joints around all dissimilar materials, penetrations, transition at wall to ceiling and walls to floor, inside corners, over existing building joints and in field at TCA recommended intervals. All control joints shall extend through setting bed and be caulked with sanded sealant to match grout joints.

H. Coursing: Install in stacked bond pattern with vertical and horizontal grout lines aligning.

3.04 CLEANING

A. Clean work under provisions of the General Conditions.

B. Clean tile surfaces.

3.05 PROTECTION

A. Protect finished installation under provisions of the General Conditions.

B. Do not permit traffic over finished floor surface.

END OF SECTION 09 30 13

SECTION 09 51 00

SURFACE APPLIED ACOUSTICAL CEILINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Acoustical tile.

B. Perimeter trim.

C. Patching.

1.02 RELATED SECTIONS

A. Section 00 72 00: General Conditions.

B. Section 09 21 16: Gypsum Board Systems: Gypsum board ceiling system substrate.

C. Section 09 90 00: Painting.

D. Section 26 50 00: Lighting: Light fixtures in ceiling system.

1.03 REFERENCES

A. ASTM E1264-14 - Acoustical Ceiling Products.

1.04 SUBMITTALS

A. Submit under provisions of Section 00 72 00.

B. Shop Drawings: Indicate tile layout and related junctions with other work or ceiling finishes, and interrelation of mechanical and electrical items related to the system.

C. Product Data: Provide data on acoustic units.

D. Samples: Submit two samples 6 x 12 inch in size illustrating material and finish of acoustic units.

1.05 QUALIFICATIONS

A. Acoustical Unit Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum three years documented experience.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform temperature of minimum 60 degrees F and maximum humidity of 40 percent prior to, during, and after installation.

1.07 SEQUENCING

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Install acoustic units after interior wet work is dry.

1.08 EXTRA MATERIALS

A. Furnish under provisions of Section 00 72 00.

B. Provide replacement tiles as indicated in general notes and drawings.

PART 2 – PRODUCTS

2.01 MANUFACTURERS - ACOUSTIC UNITS

A. Armstrong.

B. USG.

C. Or approved equal.

D. Substitutions: Under provisions of Section 00 72 00.

2.02 MATERIALS

A. Acoustic Tile: ASTM E1264, Conforming to the following:

1. Equal to Armstrong Fine Fissured Tile, No. 741 or No. 746.

2. Size: 12 x 12 inches.

3. Thickness: 1/2 inches @ T&G tiles and 5/8” @ concealed fasteners.

4. Composition: Mineral.

5. Light Reflectance: .82.

6. NRC Range: .50 to .60.

7. STC Range: 35 to 39.

8. Fire Hazard Classification: Class `A', flame spread 25.

9. Edge: Beveled.

10. Surface Color: White.

B. Adhesive: Waterproof, knife grade; type recommended by tile manufacturer.

C. Staples/Screws: Type as recommended by the manufacturer.

D. Edge Trim: Rolled aluminum profile, white color.

ACT 1 – Portable classrooms, etc.

1. Acoustical Ceiling Panels:

   a. Panel Name: **Armstrong #1717 Fine Fissured High NRC**, or equal.
   b. Panel Size: 2-foot by 4-foot.
   c. Panel Thickness: 3/4 inch.
   d. Edge Detail: Tegular.
   e. Light Reflectance: 0.82 minimum, complying with ASTM E1477.
   f. CAC: Minimum 40, UL Classified, complying with ASTM E1414.
   g. NRC: Minimum 0.70, UL Classified, complying with ASTM C423.
   h. Color: White.
   i. Recycled Content: Per Manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify site conditions.

B. Verify that substrate conditions are ready to receive the work of this section.

C. Tile surface finish shall match existing at each location.

3.02 INSTALLATION

A. Install system in accordance with manufacturer's instructions and as supplemented in this section.

B. Install edge molding at intersection of ceiling and vertical surfaces, using maximum lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

C. Locate tile on room axis according to reflected plan.

D. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.

E. Lay directional patterned units one way with pattern parallel to longest room axis. Fit border units neatly against abutting surfaces.

F. Install acoustic units' level, in uniform plane, and free from twist, warp, or dents.

G. Patching area as indicated on drawings. Replace material to natural joint or nearest intersection.

H. Apply sealant flush with the face of the tile at each staple depression in the tile.

3.03 ERECTION TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

[END OF SECTION 09 51 00]

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

Please delete this page prior to issuance.

- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-11-11 Updated from CBC 2022 to CBC 2025 as applicable

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All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- None at this time.

Cf List
- 2.01 and 2.02 need fixing. Information is a bit jumbled.

SECTION 09 67 23

FLUID-APPLIED FLOORING - EPOXY

PART 1 – GENERAL

1.01 1.1 SUMMARY

A. Section Includes

1. Trowel applied monolithic epoxy {urethane} flooring [for kitchen and food processing use].
2. Perimeter edging and integral 1/2-inch coved base.

A. Related Sections

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 09 05 61 - Common Work Results for Flooring Preparation.
3. Section 09 06 00 - Schedules for Finishes.
4. Section 09 65 15 - Cove Caps, Reducers, and Transitional Moldings.

1.02 REFERENCES

A. ASTM D2240-15(2021) – Standard Test Method for Rubber Property - Durometer Hardness.

B. ASTM E84-24 – Standard Test Method for Surface Burning Characteristics of Building Materials

C. ASTM E648-25 - Critical Radiant Flux of Floor Covering Systems

D. ADA Standards – ADA Title [II] [III] Regulations and the ADA Standards for Accessible Design.

E. CBC-8 - CBC Chapter 8, Interior Finishes

F. CBC-11B - CBC Chapter 11B, Access to Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing

G. California Fire Code (CFC)

H. NFPA 101 - Life Safety Code

I. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source

J. SMAQMD – Sacramento Metropolitan Air Quality Management District Regulations.

1.03 SUBMITTALS

A. Action Submittals

1. Product Data for each system component and accessory item
2. Certified Copies of Field Quality Assurance Test Reports
3. [Shop Drawings showing traffic areas that will receive non-slip finish and equipment and fixture layout that will receive standard smooth finish]

B. Information Submittals

1. Manufacturer's Installation Instructions
2. Certificates of Compliance regarding specified performance requirements

C. Closeout Submittals

1. Manufacturer's Maintenance Instructions

1.04 QUALITY ASSURANCE

A. Flooring system components shall be compliance with VOC content limits in SMAQMD [APCD-67.0].

B. [Installed flooring system shall have ASTM C1028-07e1, Coefficient of Friction, as follows.

1. Dry/Level Surfaces: 0.6, minimum.
2. Wet/Sloped Surfaces: 0.8, minimum.

C. Installed flooring system shall be CBC-8, Section 803.1, Class A interior finish with the following surface burning characteristics.

1. ASTM E84-24 Flame Spread: 25, maximum.
2. ASTM E84-24 Smoke Developed: 450, maximum.
3. ASTM E648-25, Critical Radiant Flux: NFPA 253, Class II, minimum 0.22 watts per square centimeter.

D. Manufacturer: company with minimum [10] [15] –years' experience manufacturing poured epoxy flooring for commercial projects similar in scale and complexity to those required for this Project.

E. Installer: company with minimum five (5) years' experience installing poured epoxy flooring for commercial [DSA inspected,] Projects similar in scale and complexity to those required for this Project.

1. Installer: approved by the materials manufacturer.

2. Installer shall have completed at least five (5) comparable projects that are more than two (2) years old; submit list with names and telephone numbers of knowledgeable client contacts.

F. Field Sample. For each color and finish of fluid applied flooring, install a Field Sample with one corner as an exploded view showing each step in the process of surface preparation and installation.

1. Size: minimum 4- by 5-feet.
2. Location: acceptable to Architect.
3. Modify materials and methods of installation for each Field Sample as required to obtain Architect's approval.
4. Document materials and methods used to obtain Architect's approval of each Field Sample. Maintain at least one copy of these documents in a readily accessible location on Site while this work is in progress.
5. Maintain access to and protect Field Sample from damage while this work is in progress.
6. [Upon acceptance of related work, Field Sample that remains in acceptable condition may remain as part of the work.]
7. [Upon acceptance of related work, remove Field Sample from Site and correct occupied space to indicated conditions.]

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in un-opened containers, factory mixed and packaged.

B. Store materials in a dry, secure area.

1.06 PROJECT REQUIREMENTS

A. Do not install flooring when temperature is below 60 degrees F or above 90 degrees F.

B. Maintain this temperature range, 24 hours before, during and 72 hours after installation of flooring.

C. Restrict traffic from area where flooring is being installed or is curing.

1.07 WARRANTY [-EXTENDED]

A. Manufacturer shall warrant installed flooring to be and to remain free from defect for a period of one (1) year [at least 3-years] from Date of Substantial Completion. Upon written notice from Owner, manufacturer shall promptly, without cost, and with least practicable inconvenience to Owner correct such defects.

B. Evidence of defect in material, installation or both shall be delamination from substrate or degradation of surface finish individually or in combination.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of the following manufacturers form the basis of design and quality intended for this Project.

1. Crossfield Products Corp., Compton, CA. Product: Dex-O-Tex
2. [Stonhard, Inc., Maple Shade, NJ]
3. Tnemec Company, Kansas City, MO
4. [[Tera-Lite, Inc./Revolan Systems, San Jose, CA.]]
5. {Sherwin Williams - General Polymers, Cincinnati, OH}
6. Prime Coat Coating Systems, Waukegan IL.
7. BASF, Product: MasterTop 1245 CLAD (formerly Selby 425)
8. Or equal, approved in accordance with Division 01 requirements for substitutions.

B. Resinous Flooring: Dex-O-Tex, Cheminert K {Tek-Crete SL (self-leveling), urethane mortar} {Tek-Crete SL B (self-leveling) urethane mortar, Broadcast aggregate} {{Tek-Crete TT, troweled Urethane Mortar}}, meet or exceed the following physical properties when tested in accordance with the cited referenced standard test method.

1. Thickness: ¼ inch [1/8 inch]
2. Compressive Strength (ASTM C579): 11,000 [[11,500]] {8,100} {{8,400}} psi.
3. Tensile Strength (ASTM C307): 1,643 [[2,500]] {1,000} {{1,080}} psi.
4. Flexural Modulus of Elasticity (ASTM C580): 4,300 [[4,500]] {2,000} {{2,000}} psi.
5. Water Absorption (MIL D3134): 0.30 [[0.25]] {0.64} {{0.64}} percent max.
6. Surface Hardness (ASTM D2240): 85.5 Durometer Shore "D" [[Durometer Shore D – 83]] {Durometer Shore D 85-90} {{Durometer Shore D85-90}}
7. Abrasion Resistance (ASTM D1044): 0.0 gr. [[1000 cycles, wt. loss]]
8. Impact Resistance (MIL-D-3134, Para 4.7.3): 0.024-inch max.
9. Adhesion Impact Resistance (Gardner Impact Tester): No chipping, cracking, or delamination and not more than 0.014-inch indentation Adhesion (A.C.I. Comm. No. 503.1): 400 psi (100 percent failure in concrete)
10. Electrical Conductivity (NFPA 56A): Di-electric
11. Flammability-Critical Radiant Flux (ASTM E648): Greater than 1.07 watts/cm2
12. Colors:
    a. Solid colors: [As scheduled in Section 090600] [413 gray] [431 gray] [402 gray] [304 Beige] [211 green] [607 red] [blue] [as selected by Architect from manufacturer's full range of available colors.
    b. [Grouted with selected variegated aggregates, top coated with clear finish coat.]
13. [Skid Resistant Epoxy Coating with aluminum Oxide: Posi-Tred O, skid-resistant. Profile: Medium Profile, 23 mils [Fine Profile, 12 mils] [Coarse Profile, 50 mils]. Color as selected by Architect.]
14. [Color quartz Topcoat: Terracolor aggregate.]
15. {Tek-Crete SL B: Aggregate; natural mineral aggregate.}
16. {Tek-Crete SL B: Top Coat; pigmented sealer; Dex-O-Tex Quik-Glaze}
17. Dex-O-Tex Cheminert SC Membrane under flooring system.
18. Antimicrobial Additive: anti-microbial biocide.

19. Integral Cove Base and Top Coat: Tek-Crete VRT
20. Vapor Control System: where moisture readings exceed 3 lbs/1000sq ft./24 hour period; Dex-O-Tex VaporControl Primer 200 [Specified in Section 072500].

C. Resinous Flooring: Tera-Lite, Tera-Gem III Industrial Flooring System (IFS) {Tera-Gem III Chemical Resistant Flooring System (CRS)} {{Tera-Gem III Decorative Quality Troweled Flooring System (DQ)}}, epoxy flooring, meet or exceed the following physical properties when tested in accordance with the cited referenced standard test method.

1. Thickness: ¼ inch [1/8 inch]
2. Compressive Strength (ASTM C579): 11,500 {{10,500}} psi.
3. Tensile Strength (ASTM C307): 6,000 {{5,000}} psi.
4. Flexural Modulus of Elasticity (ASTM C580): 4,500 {{4,700}} psi.
5. Water Absorption (MIL D3134): 0.25 percent max.
6. Surface Hardness (ASTM D2240): Shore D – 83 {{82}}
7. Abrasion Resistance (ASTM D1044): 1000 cycles, wt. loss
8. Impact Resistance (MIL-D-3134, Para 4.7.3) no cracking or delamination at: 16 ft. lbs.
9. Adhesion Impact Resistance (Gardner Impact Tester): No chipping, cracking, or delamination and not more than 0.014-inch indentation Adhesion (A.C.I. Comm. No. 503.1): 400 psi (100 percent failure in concrete)
10. Electrical Conductivity (NFPA 56A): Di-electric
11. Flammability, ASTM E635: self-extinguishing
12. Colors:
    a. Solid colors: [As scheduled in Section 099100] [gray] [tan] [green] [red] [blue] [as selected by Architect from manufacturer's full range of available colors.
    b. [Grouted with selected variegated aggregates, top coated with clear finish coat.]

13. Primer: Two-component epoxy primer, liquid components, mix 2 parts of A to1 part of B by volume. Stir with a mechanical agitator for 1-2 minutes. Distribute mixed material evenly over the floor surface using rollers, squeegees or spray. Spread rate will vary from 70 to 150 sq. ft. per gallon. Do not apply over standing water or let primer set before applying next coat.
14. Basecoat: Three-component, troweled polymer composite epoxy resin, curing agent, organic pigment and silica aggregate {{color quartz}} for Tera-Gem III IFS {CRS} {{Tera-Gem III for DQ}}. Liquid components at a ratio of 2 parts A to 1 part B by volume. To one weight equivalents of mixed liquid components add approximately 7-weight equivalent of aggregate. Mix all components using an electrical drill motor agitator or a plaster mixer. Mix all components for 2-3 minutes or until uniformly wetted, trowel to a thickness of ¼ inch.
15. Sealer: Liquid components with inorganic pigments {{DQ Clear liquid components}}, apply two (2) pigmented seal coats using the base coat liquid components, application rate approximately 125 sq. ft. per gallon.
16. [Anti-skid: No. 70 mesh silica sand or Flintshot. Applied to second seal coat.]
17. {{Quartz decorative finish: SpectraQuartz for Tera-Gem III DQ, color or blend as selected by Architect}}:

D. Flooring: Terracolor

1. Physical Properties: Provide flooring system that meet or exceed the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.
   a. Thickness: ¼ inch
   b. Compressive Strength (ASTM C 579): 10,716 psi
   c. Tensile Strength (ASTM C 307): 1,843 psi
   d. Surface Hardness (ASTM D-2240): Durometer "D" 81
   e. Abrasion Resistance (ASTM D 1044): 0.0 gr.
   f. Indentation (MIL-D-3134): <1.0 percent
   g. Impact Resistance (Gardner Impact Tester): No chipping, cracking, or delamination
   h. Adhesion (A.G.I. Comm. No. 503.1):>400 psi (100 percent failure in concrete)
   i. Electrical Conductivity (NFPA 56A): Di-electric
   j. Flammability (ASTM E-648/NFPA 253/FTMS 372): Greater than 1.07 watts/cm² (Class I)]

E. Flooring: DEX-O-TEX Decor-Flor

1. Provide flooring system that meet or exceed the listed minimum typical physical properties at 75oF (24oC) tested according to referenced standard test method:
   a. Compressive Strength ASTM C579 — 10,500 psi
   b. (Resin, Hardener & Aggregate) — (738 kg/cm2)
   c. Tensile Strength ASTM C307 — 1,800 psi
   d. (Resin, Hardener & Aggregate) — (127 kg/cm2)
   e. Flexural Strength ASTM C580 — 4,000 psi (281 kg/cm2)
   f. Surface Hardness ASTM D2240 Shore — D 80-85
   g. Indentation Characteristics
      1) (Steadily Applied Load) MIL-D-3134, 0.005 inch
      2) Para. 4.7.4.2.1, 2000 lbs. on 1 inch steel ram imposed for 30 minutes over concrete substrate, indented, (0.127 mm)

   h. Indentation Characteristics MIL-D-3134, Para. 4.7.3
      1) (Impact Load) — 0.011 inch
      2) (2 lb. 0.908 kg.) Indent from steel ball dropped twice from 8 ft. height, (0.28 mm)

   i. Adhesion ASTM D4541 — > 400 psi
      1) (100 percent failure in concrete) — (28.1 kg/cm2)

   j. Water Absorption MIL-D-3134 — < 1.0%
   k. Abrasion Resistance ASTM D4060
      1) (CS17, 1000gr load, 1000 cycles) — 0.04 gr

   l. Flammability ASTM D635 — Self-Extinguishing
   m. Skid Resistance — Bonded to Concrete Varies depending upon surface texture selected.

F. <Stonclad GS as manufactured by Stonhard, Inc., Maple Shade, NJ, nominal 1/4-inch-thick system comprised of two-component moisture tolerant, penetrating epoxy primer, three-component troweled mortar consisting of epoxy resin, curing agent and selected, graded aggregates blended with inorganic pigments. Aggregate broadcast and a high performance, two-component, clear epoxy sealer.

G. Stonblend GSI is a nominal 3/16 in./5 mm flooring system. It combines decorative looks with excellent chemical and wear resistance and cleanability. Its surface provides a moderate degree of slip resistance while remaining resistant to staining, marring, and yellowing. It is comprised of:

1. Stonblend Primer: two-component, penetrating, UV resistant epoxy rimer
2. Stonblend GSI Base: three-component, troweled mortar consisting of epoxy resin, curing agent and colored quartz silica aggregate
3. Stonblend Grout Coat: two-component, clear, UV resistant epoxy sealer
4. Stonshield Sealer: two-component, clear UV resistant, leveling epoxy sealer
5. Stonseal GS7 Clear Flat: two-component, non-reflective, waterborne, aliphatic polyurethane coating>

H. [Resinous Flooring: Stonhard STONRES RTZ, three component resilient urethane flooring system, 3/16-inch nominal thickness, with rubber aggregates mortar; two-component grout coat and two-component clear coat. Meet or exceed the following physical properties when tested in accordance with the cited referenced standard test method. **Not Epoxy**

1. Tensile Strength (ASTM C307): 1200 psi.
2. Surface Hardness (ASTM D2240, Shore A): 85
3. Percent elongation (ASTM D638): 150 percent
4. Impact Resistance (ASTM D2794): greater than 60 inch/pounds
5. Static Load Limit (ASTM F970, 125-pound load): 0.002 inch
6. Residual Indentation (ASTM F1914): Less than 1 percent
7. Abrasion Restance (ASTM D4060): 0.3 gm
8. Flammability-Critical Radiant Flux (ASTM E648): Class 1
9. Slip resistance (ASTM F1679): 0.6 Dry
10. Color: as selected by Architect from manufacturer's full range of available colors.]

2.02 MATERIALS

A. {AquArmor Ceramic Carpet Decorative Flooring System as manufactured by Sherwin Williams - General Polymers., Cincinnati, OH, is a nominal 1-8 inch - 3/16-inch-thick system which produces a chemical resistant, tough, cleanable finish for floors.

B. Flooring System

1. Primer:
   a. 3460 plus 20 percent potable water — 250 sq. ft./gal (6-8 Mils WFT)
2. Slurry at 1/8 inch:

a. 3460 1:4 100 sq. ft/2.5 gal.
b. 5150 27-30 lbs/2.5 gal.
c. 5900F To Excess 0.6 lbs/sq.ft.

3. Bonding/Broadcast:
   a. 3561 4:1 65-70 sq. ft./gal
   b. 5900F To Excess 0.4 lbs/sq.ft.

4. Grout
   a. 3745 2:1 100 sq. ft./gal
      Premeasured unit
5. Topcoat
   a. 3745 2:1 200 sq. ft./gal
      Premeasured units}}

2.03 ACCESSORIES

A. Waterproofing Membrane: Type recommended or produced by manufacturer for flooring system, for type of service and floor condition indicated. Fluid-Applied, Dex-O-Tex Cheminert SC Membrane or equal. [[not needed for Tera-Lite III]]

1. Primer: manufacturer's standard.
2. [Option: Fabric reinforcement place in wet membrane and top coated.]

B. Anti-Microbial Additive: Incorporate antimicrobial chemical additive to prevent growth of most bacteria, fungi, algae and actinomycetes.

C. Vapor Control System: per Section 09 05 61 Common Work Results for Flooring Preparation [Tera-Lite III; Aquafin Vaportight Coat-SG3, epoxy-based].

D. Primer: manufacturer's bond coat.

E. Floor transitions: Saw cut concrete and chamfer (Key in edge) to match level of existing flooring [Specified in Section 096513.36].

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify Site conditions are ready for the work of this Section. Notify Architect and Inspector of Record at least 48-hours prior to installation of testing and at conclusion of tests.

1. Concrete shall be cured minimum 28 days prior to application of sealer.
2. Conduct ASTM F1869-23 calcium chloride dome tests to verify that concrete floors are dry within moisture vapor emissions limits of flooring system manufacturer. Set one test for each 1,000 sf. of floor area but at least in four (4) in each different areas or location.

3. Conduct ASTM F710-22 alkalinity testing of concrete substrate; pH levels shall not exceed the recommendations of the floor coating manufacturer, the adhesive manufacturer, or both.
4. Conduct Relative Humidity Test Method in accordance with ASTM F-2170-19a -with a Wagner Rapid RH probe to verify relative humidity and surface pH, ASTM F710-22, of concrete floor slabs, the method
   a. Requires drilling holes at diameter not to exceed outside diameter of probe by more than 0.04 inch to depth equal to 40 percent of slab's thickness (elevated structural slab shall be tested at depth equal to 20 percent of slab thickness).
   b. Place probe to full depth of test hole, place cap over probe.
   c. Permit test site to acclimate, or equilibrate, for 72 hours prior to taking relative humidity readings.
   d. Remove cap and press button on the probe to obtain reading.
   e. Relative humidity readings for substrates receiving non-permeable flooring are 75 percent or lower.
   f. Testing shall require three (3) tests in first 1,000 square feet, with one additional test per each additional 1,000 square feet of concrete slab surface.
   g. Alkalinity testing: follow procedures per ASTM F710-22, ranges shall not exceed those recommended by the flooring manufacturer.

B. Do not begin installation until unsatisfactory conditions are corrected. Beginning installation means acceptance of existing conditions and preparatory work of others.

3.02 PREPARATION:

A. Install Vapor Emission Treatment Systems per Section 090561.13 where tests reveal presence of more than acceptable moisture level in accordance with Test Method ASTM F-1869-23 and ASTM F 2170-19a.

B. Clean substrate; remove dirt, oil, grease, construction markings, and foreign matter that could adversely affect floor coating appearance or performance.

1. Surface shall be free of soil, dust, base material, oil, grease, paint, curing compounds and other foreign matter.
2. Surface shall be cleaned and allowed to dry thoroughly. Cleanse dirty or contaminated floors with approved cleaner as per manufacturer's instructions. Rinse thoroughly with clean water.
3. Contaminated Concrete Surfaces: clean concrete surfaces by sandblasting, steel shot-blasted, scarified, water blasted, or other approved technique by the flooring manufacturer.

C. Repair minor defects. The substrate was prepared under Section [03 01 30.71] [03 01 30.72] [03 30 00]; remove ridges, fill depressions and repair cracks as required by floor coating manufacturer to execute specified warranty.

1. Apply, trowel and float filler to leave a smooth, flat, hard surface, free of bumps or depressions of any size.
2. Prohibit traffic from area until filler is cured.

D. Vacuum clean substrate.

E. Apply primer as recommended by the materials manufacturer.

F [Install waterproof membrane per manufacturer's recommendations.]

3.03 INSTALLATION

A. Mix components according to manufacturer's recommendations.

B. Apply primer (bonding coat) per manufacturer's recommendation.

C. Trowel apply ¼ inch [1/4 inch for Terracolor] thick body coat. Build up in minimum of two (2) coats.

D. {Body Coat: Over prepared surface, screed mortar mix at nominal ¼ inch thickness. Allow material flow out and being to settle. Back roll with a spike roller or looped roller to distribute material smooth even finish.}

E. [Slip Resistant Finish:

1. Broadcast slip resistant finish into wet coating at rate recommended by manufacturer to achieve specified coefficient of friction. Backroll to encapsulate and distribute aggregate.
2. Remove Excess Aggregate: Remove all loose or unsound aggregate from the cured surface. Vacuum up all dust and fine particles from the surface, remove any ridge lines and detail all imperfection in the textured surface.
3. [In kitchen and food service areas, scheduled for this flooring, apply slip resistant finish only in traffic areas of floor. Do not apply slip resistant finish in locations that will be under equipment, furnishings or fixtures and similar difficult to clean locations.]
4. [Power sand to remove trowel marks.

F. [[Sealer: apply two (2) seal coats using the base coat liquid components. Sand between coats. Apply the first seal coat. Let the surface set. Mix and place the second seal coat similarly to the first coat, application rate approximately 125 sq. ft. per gallon. During second seal coat broadcast a graded silica aggregate for anti-skid and backroll.]] ****No sealer required for Tek-Crete SL*****

G. {Pigmented Sealer for Tek-Crete SL B: Dex-O-Tex Quik-Glaze, apply over slurry mortar.}

H. Integral Base Application: Apply vertical areas with same materials or base material specified. Height of integral base application: 6 inches, including ½ inch coved radius, unless otherwise indicated. Mask off base to provide a straight, neat, level top edge.

I. Apply clear sealer, or pigmented where scheduled, top coat per manufacturer's instructions.

3.04 PROTECTION

A. Protect finished installation from traffic until curing is complete.

END OF SECTION

REVISION SUMMARY

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Please delete this page prior to issuance.

- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-01-31 – Section revised for current product information.
- 2025-11-11 – Updated from CBC 2022 to CBC 2025 as applicable

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When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

Please delete this page prior to issuance.

All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- District typically wants broadloom carpet in student spaces including classrooms. Modular tiles can be used in administrative spaces and at other locations as accepted by District.

SECTION 09 68 00

CARPET

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Broadloom and carpet tile.
2. Integrated walk-off mats
3. Base finish and accessories
4. Subfloor testing and preparation.
5. Installation of vapor retarder.

B. RELATED SECTIONS

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 00 72 00: Exhibit C: Abatement of Hazardous Materials.
3. Section 03 31 00: Structural Concrete (for floor flatness and floor levelness).
4. Section 07 26 00: Vapor Retarders
5. Section 09 21 16: Gypsum Board Systems: Wall materials to receive base.
6. Section 09 65 00: Resilient Flooring.

1.02 REFERENCES

A. ANSI/ASTM E648-~~15e1~~ 25 - Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

B. ASTM F1869-23 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

1.03 QUALITY ASSURANCE

A. Manufacturer, Contractor, and Installer Qualifications:

1. Manufacturer: Company specializing in contract flooring with ten years minimum experience.
2. Flooring Contractor: Company with five years' minimum documented experience, approved by manufacturer for the installation of the specified products and shall have access to all manufacturers required technical, maintenance, specifications and related documents.
3. Installer:
   a. Floor covering installer must be factory trained and certified for the installation of the specific products being installed.

b. Installer to provide project inspector proof of certification prior to starting work.
c. Certified installer must be present on job site while work is in progress.

4. Testing Laboratory:
   a. Certified, bonded, qualified and experienced agency to perform pH and Relative Humidity (RH) emission tests.

B. Pre-Floor Covering Installation Meeting:

1. Contactor to notify Construction Manager with a minimum of 5-days' notice when anticipated to be ready for pre-floor covering installation meeting. (After subfloor preparation is complete and ready for floor covering installation.)
2. Contractor, installer, and manufacturer representative are required to attend pre-floor covering meeting. Contractor is responsible for coordinating and scheduling their attendance.
3. Construction Manager will schedule meeting with Contractor team, Project Inspector, and Architect.
4. Purpose of Meeting: To review subfloor preparation, verification of readiness for floor covering installation and use of correct products, verification of the acclamation of correct finish materials and review installation requirements.

C. Manufacturer's Field Services:

1. Manufacturer representative to attend the "Pre-Flooring" meeting.
2. Upon Owner or Architect's request, and with at least 72-hour notice, provide manufacturer's representative site visit(s) for inspection of product installation.
3. At the Owner's request, manufacturer representative to attend operation and maintenance training meeting for Owner's custodial staff prior to acceptance of floor covering installation.

1.04 SUBMITTALS

A. Provide a complete submittal package with all components required within this section. Submit per Section 01 33 00.

1. Product Data: Provide product data describing physical and performance characteristics, sizes, patterns, colors, material safety data sheets, and method of seaming and manufacture's installation instructions for all proposed products.

2. Shop Drawings:
   a. Provide a floor plan indicating all proposed seam locations and integrated walk-off mats. Indicate method of joining seams, and direction of carpet.

3. Samples:
   a. Submit samples for color selection illustrating color and pattern for floor material with samples of matching walk-off mats, rubber base and transition material proposed for installation.

b. Submit sample of solvent welded seam.

4. Maintenance Data: Submit manufacturers recommend cleaning and maintenance data. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
5. Recycled Content Percentage Submittals
6. Submit a statement signed by the manufacturer's Executive Officer or independent certification third-party that the provided carpet materials have the specified recycled material percentage.
7. Submit documentation of manufacturer's take-back program for carpet. Including:
   a. Confirmation that the new carpet being installed will be accepted (at the point of future replacement) through a manufacturer's operated program for recycling or reuse;
   b. Written description of such a process for the recycling and/or recovery of used/worn products;
   c. Contact information for the take-back program.
8. Existing Carpet Recycling Plan and Recycling Certification. Submit documentation describing the reclamation plan for existing carpet. Include appropriate contact information, overview of procedures, and limitations and conditions applicable to the project Carpet recycling options consist of:
   1. Repurposing - reusing the product in another application such as facilitating the donation of used carpeting to charities and other nonprofit organizations.
   2. Closed Loop Recycling - turning waste materials into new materials of the same value, such as vinyl backing into vinyl backing and nylon yarn into nylon carpet yarn.
   3. Open Loop Recycling – creating other product types from reclaimed carpet. For example, turning nylon face fiber into automotive parts or carpet padding, including nylon face fiber in recycled backings
   4. Waste-to-Energy - using carpet for waste-to-energy. In the case of waste-to-energy, manufacturer shall justify why carpet cannot be recycled as this method should be a last resort.
   5. Landfill or incineration – are not approved disposal methods
   6. At the completion of the project, a certificate shall be furnished verifying the reclamation of the carpet and the pounds of material diverted from the landfill.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit cleaning and maintenance data under provisions of Section 01 33 00.

B. Include maintenance procedures, recommended maintenance materials, and suggested schedule and products for cleaning.

C. Provide in-service training with Owner's custodial staff prior to acceptance of flooring for proper care and maintenance of carpet. Also review and provide recommended type of furniture casters and glides.

1.06 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Storage and Protection: Store materials protected for exposure to harmful weather conditions and at a temperature and humidity conditions recommended by manufacturer. Materials should be stored in areas that are fully enclosed, weather tight with the permanent HVAC system set at a uniform temperature of at least 68 degrees F (20 degrees C) for 72 hours prior to, during and after installation.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain minimum 70 F ambient temperature at floor level three days prior to, during, and 24 hours after installation of materials.

C. Prior to testing for moisture vapor emission rate, space shall be enclosed, fully weather-tight, wet-work in space shall be completed and nominally dry, work above ceilings finished. The test site should be at the same temperature and humidity expected during normal use.

D. Maintain lighting at a minimum uniform level of 50 or more-foot candles in areas where the floor system is being installed.

E. Comply with CRI's "CRI Carpet Installation Standard" for temperature, humidity, and ventilation limitations.

F. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weather tight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants.

G. Floor temperature should be 60 °F minimum for proper adhesive curing and performance.

H. If subfloor is contaminated with an oily residue either from removal of “cutback” during asbestos abatement or from a previous end use such as metal fabrication, this residue MUST be totally removed or covered prior to applying modular adhesive and carpet.

1.08 CONCRETE SUBFLOOR TESTING

A. Testing for internal relative humidity of concrete slabs must be conducted in accordance with the current version of ASTM F2170-19a, not to exceed manufacturer’s requirements (ASTM F2170-19a – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes).

B. The Flooring Contractor shall verify in writing to the Owner, a minimum of thirty (30) days prior to scheduled carpet installation, the following substrate conditions:

1. Moisture: Initial emission rate, as tested with in-situ probes, per ASTM F-2170-19a.

2. Alkalinity: pH level. Testing the pH at the surface of a concrete slab must be conducted in accordance with the current version of ASTM F710, not to exceed manufacturer's requirements (ASTM F710-19a – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.)

C. High Moisture and /or Alkalinity Readings:

1. New Construction (New Concrete Slab)
   a. If the Contractor's test results indicate that the slab relative humidity (RH) readings are below those of flooring manufacturer's requirement, then the Owner's representative will initiate independent testing to confirm results and will initiate additional testing using petrographic analysis to determine if the Water Cement Ratio and sufficient hydration has taken place.
      1) If it is determined that the Specifications were followed in their entirety, water/cement ratio (as specified), and or the concrete surface has been adequately hydrated; then the Contractor shall initiate a credit to the Owner for the cost of installation of the Vapor Retarders as specified in section 07 26 00 that were not installed.

2. Modernization Construction (Existing Concrete Slab)
   a. If the Contractor's test results indicate that the slab relative humidity (RH) readings are below those of flooring manufacturer's requirement, then the Owner's representative will initiate independent testing to confirm results.
      1) If the independent test results do not substantiate the Contractor's findings, then the Contractor will be directed to proceed with the Vapor Retarder installation and the retesting cost will be back charged to the contractor.
      2) If the independent test results confirm the Contractor's findings, then the Contractor shall initiate a credit to the Owner for the cost of installation of the Vapor Retarders as specified in section 07 26 00 that were not installed.

D. Comply with manufacturer's written requisites for field conditions including but not limited to testing for moisture, confirmation of vapor retarder, floor prep, bond test, photo documentation, etc.

1.09 EXTRA MATERIALS

A. Provide a minimum of 4 square yards of each color installed. In addition, provide all usable scraps one sq. yd. or larger in size. Remnants shall be packaged, identified and delivered to the Owners' Representative, who will retain any he chooses for future repairs before they are removed from the job site.

B. Provide a minimum of 10 lineal feet of base and transition pieces of each material and color specified or 2 % whichever is greater.

1.10 WARRANTY

A. Manufacturer's Warranty: Twenty (20) year minimum manufacturer warranty commencing on recordation date of the Notice of Completion.

1. Should carpet, tend to creep, bulge, be defective in manufacturing, or show a substantial amount of wear - carpet shall be replaced with new carpeting at no cost to the Owner. Manufacturer to submit written warranty covering the following:
   a. 20 Year minimum, non-prorated Guarantee shall also include:
      1) No resiliency loss of backing.
      2) No zippering.
      3) Static protection (will not lose static property—will not give static discharge above 3.5KV).
      4) No edge ravel or zippering.
      5) Delamination.
      6) Surface wear (maintains at least 90% surface pile weight).
      7) No staining.
      8) Dimensional Stability.
      9) Moisture Resistance.

PART 2 – PRODUCTS

2.01 MATERIALS

DESIGNERS!! Carpet selection shall be per project. Coordinate with District.

A. Carpet (Vinyl Cushioned Tufted Textile) and integrated walk-off mats: Color as selected by Owner Representative from Manufacturer's standard range. No other substitutions will be allowed.

1. Tarkett Commercial – Hybrid resilient sheet flooring
   a. "Aftermath II" Series, 6'-0" roll, glue down. Powerbond cushion RS vinyl backing system and seam sealer.
   b. Or Equal.

2. Milliken Commercial – Broadloom Roll
   a. "Formwork", 13'-6" roll, glue down. Endura-Loc backing system.

~~3. Tarkett Commercial – Carpet Tiles~~
~~a. "Aftermath II" Series, 24"x24" tile, glue down. Flex Aire cushion backing system.~~
~~b. Or Equal.~~

~~4. Milliken Commercial – Carpet Tiles~~
~~a. "Journal Line By Line", 50cm x 50cm, glue down. PVC Free WellBac Comfort Cushion.~~

5. Tarkett Commercial – Walk-off System to match carpet backing at specified locations
   a. "Abrasive Action II" walk-off system Powerbond Cushion RS or 24"x24" Flex Aire cushion tile, at all exterior doors in carpeted rooms. Color to be coordinated with carpet color selection.

6. Milliken Commercial – Entrance Flooring

a. “OBEX Tiles” carpet entryway system at all exterior doors in carpeted rooms. Color to be coordinated with carpet color selection.

B. Rubber Wall Base: Cove style, conforming to ASTM F 1861 or FS-SS-W-40, Type 1. New Construction - 4” high and 1/8-inch (3.2mm) gauge. Modernization-type projects and new construction cafeteria spaces - 6” high and 1/8-inch (3.2mm) gauge. No manufactured corners.

1. Burke Industries.
2. Armstrong.
3. Musson Rubber Co.
4. Roppe Rubber Corp.
5. Approved equal.

C. Resilient Edge and Adapter/Transition Strips: 1/8-inch-thick, tapered or bullnose, minimum of 1 inch wide.

1. Roppe
2. Johnsonite
3. Flexco Floors
4. Approved equal.

D. Leveling and Patching Compounds:

1. Portland cement-based patch recommended by carpet manufacturer. Install as recommended by manufacturer for specific application.

E. Primer:

1. Tarkett Commercial: C-36E primer.
2. Milliken: None required.

F. Adhesives: Low VOC, waterproof, and as recommended by product manufacturer.

1. Tarkett “RS” pre applied microencapsulated tackifier.
2. Tarkett Commercial: C-16E Powerbond Adhesive.
3. Milliken: Mosaic Moisture XT Spray.

PART 3 – EXECUTION

3.01 EXAMINATION

A. New Construction (New Concrete Slab)

1. Installer must examine areas and conditions under which resilient flooring and accessories are to be installed and must notify General Contractor in writing of conditions detrimental to proper

and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Owner and Architect.

2. Testing for internal relative humidity of concrete slabs must be conducted in accordance with the current version of ASTM F2170-19a, not to exceed manufacturer's requirements (ASTM F2170-19a– Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes).
3. Verify that new surfaces are smooth and flat with maximum variation as specified in 03 31 00-Structural Concrete and are ready to receive work.
4. Beginning of installation on new substrates means acceptance of substrate. The existing substrates will require as much preparation as necessary to provide proper installation of new materials.

B. Modernization Construction (Existing Concrete Slab)

1. If existing flooring was determined to be asbestos containing and required abatement, verify that the abatement work has been accepted by the Owner's representative prior to commencing work.
2. Testing for internal relative humidity of concrete slabs must be conducted in accordance with the current version of ASTM F2170-19a, not to exceed manufacturer's requirements (ASTM F2170-19a – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes).

3.02 PREPARATION

A. New Construction (New Concrete Slab)

1. Install underlayment where flooring is being installed on a wooden subfloor per the manufacturer's instructions.
2. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with manufacturer recommended subfloor filler.
3. Apply, trowel, and float filler to leave a smooth, flat, hard surface.
4. Prohibit traffic from area until filler is cured.
5. Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dirt, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue. Vacuum clean substrate.
6. Apply primer to concrete surfaces.

B. Modernization Construction (Existing Concrete Slab)

1. Remove existing finishes, adhesives, and other materials as necessary to properly prepare existing substrates. (Refer to asbestos abatement procedures.)
2. Install underlayment where flooring is being installed on a wooden subfloor per the manufacturer's instructions.
3. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
4. Fill low spots, cracks, joints, holes and other defects with filler prior to flooring installation.

5. Apply, trowel, and float filler to leave a smooth, flat, hard surface.
6. Prohibit traffic from area until filler is cured.
7. Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dirt, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue. Vacuum clean substrate.
8. Apply primer to concrete surfaces.

3.03 CARPET INSTALLATION

A. Install in accordance with manufacturers' instructions and recommendations with fully welded seams.

B. Install flooring square with room axis and in accordance with approved shop drawing.

C. Layout roll-goods in a manner to minimize seams and avoid seams in traffic areas. End butt joints shall be kept to a minimum, shall be staggered, and shall occur where approved on detail plan layout. Use the largest sections possible to minimize seams. Avoid cross seams, filler pieces and strips. Match edges for color shading and pattern at the seams in compliance with the manufacturer recommendations.

D. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

E. Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture, including pipes, outlets, edgings, thresholds, nosing and cabinets.

F. Install edge strips at unprotected or exposed edges, and where flooring terminates.

G. Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers.

H. Adhere carpet to prepared substrate without producing open cracks, voids, raising and puckering at joints, telegraphing to adhesive spreader marks, or other surface imperfections in completed installation.

I. Fully solvent weld all seams. Seams shall be unnoticeable in finished installation.

J. Verify carpet match before cutting to ensure minimal variation between dye lots.

K. Double cut carpet, to allow intended seam and pattern match. Make cuts straight, true, and unfrayed.

L. Lay carpet on floors with run of pile in same direction as anticipated traffic.

M. Do not change run of pile in any room where carpet is continuous through a wall opening into another room. Locate change of color or pattern between rooms under door centerline.

N. Complete installation shall conform to the Carpet Installation Standard of Carpet and Rug Institute (CRI).

3.03 INTEGRATED WALK-OFF MAT INSTALLATION

A. Install in accordance with manufacturers' instructions and recommendations.

B. Install modular tile like any “dry-back” modular with a full-spread wet adhesive.

C. Installation instructions for Tarkett Commercial’s Powerbond Non-RS (dry-back) Modules can be used as “reference only.”

D. Adhesives below are offered to install modular tile product based upon application and intended use:

1. C-EX - Pressure Sensitive Releasable Adhesive as required by manufacturer
2. Milliken Mosaic XT.

E. Modular tile should be securely attached to the sub-floor in compliance with ADA Accessibility Guidelines, latest edition, for Building & Facilities, Section 4.5.3.

F. Provide integrated walk-off mats at all exterior door location where carpet is indicated to be installed. The walk-off mats shall extend a minimum of the door width plus six inches (6”) and six feet (6’-0”) in the direction of travel or as indicated on the drawings.

3.04 INSTALLATION - BASE MATERIAL

A. Install resilient wall base on entire wall perimeter including toe spaces and open ends of cabinets. Set all bases in adhesive as recommended by the manufacturer. All joints in bases shall be plumb, flush, tight and inconspicuous. Seat top edge and back of base firmly against the wall. Wrap base around all outside corners and no seams within 12” of corners. Interior corners shall be mitered and tightly fitted.

3.05 PROTECTION

A. Prohibit traffic from carpet areas for 24 hours after installation.

B. Protect flooring from damages by other trades prior to owner occupancy.

3.06 FINAL CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage. Remove and dispose of all small scraps, cartons, and rubbish upon completion of the work. Remove all loose threads with sharp scissors.

B. Clean carpet of all spots with proper spot remover, and vacuum carpet surfaces.

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

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- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2023-01-06 – Removed some left over editor marks. Corrected incorrect spec references.
- 2025-01-31 – Edits included from Eric Patricio.
- 2025-11-11 – Updated from CBC 2022 to CBC 2025 as applicable

DISTRICT DESIGN STANDARDS

Notice to All Users and Designers!

In many cases, the District does not govern the technical 3-part specifications for the Design Team. The design standards information shown below is provided to convey the District's intentions on manufacturers, products and procedures that the District does or does not want to be used on their projects. The items listed below are to assist you with understanding what needs to be reflected in your 3-part specification without forcing a pre-written specification upon you. Where a 3-part specification section is provided by the District, the items below are design parameters to be considered when applying this specification section to your design. The design team shall confirm and coordinate all product and system requirements with the District during design regardless of them being design standards or full 3-part specifications.

When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

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All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- Do not paint galvanized materials i.e. handrails.
- Try to limit number of colors used on a project to reduce attic stock. All colors and product material to be used are to be APPROVED by the SCUSD paint shop Supervisor before application NO EXCEPTIONS.
- Murals require an anti-graffiti coating on a case by case basis. Provide as needed.

SECTION 09 91 00

PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation and field painting of exposed interior items and surfaces, including mechanical and electrical equipment that do not have a factory-applied finish.

1.2 RELATED SECTIONS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

B. Section 05 50 00 - Metal Fabrications: Shop priming ferrous metal.

C. Section 08 11 00 - Steel Doors and Frames: Factory priming steel doors and frames.

D. Section 09 29 00.10 - Gypsum Board Assemblies: Surface preparation of gypsum board.

E. Division 23: Mechanical.

F. Division 26: Electrical.

1.3 REFERENCES

A. ASTM International (ASTM): ASTM D-16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.

B. Steel Structures Painting Council (SSPC) SP6 - Commercial Blast Cleaning Procedures.

C. Steel Structures Painting Council (SSPC) SP10 - Near White Blast Cleaning Procedure.

1.4 DEFINITIONS

A. General: Standard coating terms defined within Masters Painters Institute (MPI) manual.
   1. Gloss level 1 - Flat with a gloss range below 5 when measured at a 60-degree meter and 10 when measured at an 85-degree meter.
   2. Gloss level 2 - Low Sheen with a gloss range of 5 to 10 when measured at a 60 degree meter and 10 to 35 when measured at an 85 degree meter.
   3. Gloss level 3 - Eggshell with a gloss range between 10 and 15 when measured at a 60-degree meter and 10 to 35 when measured at an 85-degree meter.
   4. Gloss level 4 - Satin with a gloss range between 25 to 35 when measured with a 60 degree meter.

5. Gloss level 5 - Semi-Gloss with a gloss range between 50 and 55 when measured at a 60 degree meter.
6. Gloss level 6 - Gloss with a gloss range more than 70 when measured at a 60 degree meter.

1.5 SUBMITTALS

A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Preparation instructions and recommendations.
3. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

C. Paint Exposed Surfaces: If an item or a surface is not specifically mentioned, paint the item, or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.

D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label:

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.

C. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

D. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C), unless manufacturer's instructions specifically states.

E. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).

F. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
   1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.8 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and, in the quantities, described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.

B. Quantity: Furnish Owner with an additional three percent, but not less than 1 gal (3.8 l) or 1 case, as appropriate, of each material and color applied.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Dunn Edwards Paints.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 PAINT MATERIALS – GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service

and application, as demonstrated by manufacturer based on testing and field experience.

B. VOC Classification: Provide materials, including primers, undercoats, and finish-coat materials, which meet local air quality management district regulations.

C. Color: Refer to Finish Schedule and Paint Legend for paint colors.

D. Application Rate: Coating thickness for primer, intermediate, barrier and finish coats shall be measured as Dry Film Thickness (DFT) and comply with manufacturer's published recommendations.

2.3 Interior Paint Systems

A. Gypsum and Plaster Walls:
1. Prime Coat: DE Ultra – Grip Acrylic Premium Primer
2. 2nd Coat: DE Spartawall Acrylic Low VOC Eggshell Enamel
3. 3rd Coat: DE Spartawall Acrylic Low VOC Eggshell Enamel

B. Suspended and Surface applied Ceilings:
1. Prime Coat: DE Ultra – Grip Acrylic Premium Primer
2. 2nd Coat: DE Ceiling Paint Flat Finish
3. 3rd Coat: DE Ceiling Paint Flat Finish

C. Wood Doors & Frames (Painted Finish):
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

D. Previously Painted Wood:
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

E. Wood Previously Stained to be Painted:
1. Prime Coat: DE Ultra – Grip Acrylic Premium Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

F. Wood to be re-finished and sealed:
1. 2 Coats: Old Masters Master Armor Satin Finish

G. Metal Doors and Frames:
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

H. Vinyl Tackable wall Panels:
1. Prime Coat: Zinsser B-I-N Shellac Base Primer
2. 2nd Coat: DE Spartawall Acrylic Low VOC Eggshell Enamel

3. 3rd Coat: DE Spartawall Acrylic Low VOC Eggshell Enamel

2.4 Exterior Paint Systems

A. Concrete Substrates, Masonry, Stucco, Non-Traffic Surfaces:
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish
3. 3rd Coat: DE Spartashield100% Acrylic Exterior Eggshell Finish

B. Wood Siding:
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish
3. 3rd Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish

C. Wood Fascia:
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Spartashield 100% Acrylic Exterior Semi-Gloss Finish
3. 3rd Coat: DE Spartashield 100% Acrylic Exterior Semi-Gloss Finish

D. Wood Benches:
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

E. Interior & Exterior Surfaces of Exterior Doors:
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

F. Door Mullions at Pair Doors:
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

G. Painted Infill Panels at window Locations:
1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

H. Ferrous Metal Substrates:
1. Prime Coat: DE Enduraprime High Performance Acrylic Metal Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

I. Metal Handrails, Guardrails, Barricade Rails & Fencing:
1. Prime Coat: For Ferrous Metal- DE Enduraprime High Performance Acrylic Metal Primer and for Galvanized Metal – DE Ultra-Shield Galvanized Metal Primer
2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel
3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Enamel

J. Metal Panels Fascia:
   1. Prime Coat: DE Surfaco Chalk Binding Primer
   2. 2nd Coat DE Spartashield 100% Acrylic Exterior Semi-Gloss Finish
   3. 3rd Coat: DE Spartashield 100% Acrylic Exterior Semi-Gloss Finish

K. Metal Gates:
   1. Primer Coat: DE Enduraprime High Performance Acrylic Metal Primer
   2. 2nd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Finish
   3. 3rd Coat: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss Finish

L. Gutters, downspouts, Cap & Edge Flashings.
   1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
   2. 2nd Coat: DE Spartashield100% Acrylic Semi-Gloss Finish
   3. 3rd Coat: DE Spartashield 100% Acrylic Semi-Gloss Finish

M. Canopies Including Undersides:
   1. Prime Coat: For Ferrous Metal- DE Enduraprime High Performance Acrylic Metal Primer or for Galvanized Metal DE Ultrashield Galvanized Primer
   2. 2nd Coat: DE Enduracoat High Performance Semi-Gloss Finish
   3. 3rd Coat: DE Enduracoat High Performance Semi-Gloss Finish

N. Extended Roof Overhangs and Covered Walks Including Undersides:
   1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
   2. 2nd Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish
   3. 3rd Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish

O. Flag Poles:
   1. Prime Coat: DE Enduraprime High Performance Acrylic Metal Primer or for Galvanized Metal DE Ultrashield Galvanized Primer
   2. 2nd Coat: DE Enduracoat Hgh Performance Semi-Gloss Finish
   3. 3rd Coat: DE Enduracoat High Performance Semi-Gloss Finish

P. Relocatable Classroom Buildings and Skirts:
   1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
   2. 2nd Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish
   3. 3rd Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish

Q. Relocatable Building Ramp Skirts & Handrails:
   1. Prime Coat: DE Ultra-Grip Acrylic Premium Primer
   2. 2nd Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish
   3. 3rd Coat: DE Spartashield 100% Acrylic Exterior Eggshell Finish
   4. Handrails: 2 Coats: DE Aristoshield Water Based Urethane Alkyd Semi-Gloss

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
   1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.
   2. If a potential incompatibility of primers applied by others exists, obtain the following from the primer Applicator before proceeding:
      a. Confirmation of primer's suitability for expected service conditions.
      b. Confirmation of primer's ability to be top coated with materials specified.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
   1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
   1. Provide barrier coats over incompatible primers or remove and reprime.
   2. Provide barrier coats over incompatible primers or remove primers and reprime substrate.
   3. Cementitious Substrates: Prepare concrete, brick, concrete masonry block, and cement plaster surfaces to be coated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to dull surfaces. If hardeners or sealers have been used to improve curing, use mechanical methods to prepare surfaces.
      a. Use abrasive blast-cleaning methods if recommended by coating manufacturer.
      b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not coat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.

   4. Wood Substrates: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Smoothly sand surfaces exposed to view and dust off.
      a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer, before applying primer.

b. Immediately on delivery, prime edges, ends, faces, undersides, and backsides of wood to be coated.
c. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
d. Determine moisture content of surfaces by performing a moisture test. Do not coat if moisture content exceeds 15 percent.

5. Ferrous-Metal Substrates: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC recommendations.
   a. Blast-clean steel surfaces as recommended by coating manufacturer and according to SSPC-SP 10.
   b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
   c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, solvent clean, and touch up with same primer as the shop coat.

6. Nonferrous-Metal Substrates: Clean nonferrous and galvanized surfaces according to manufacturer's written instructions for the type of service, metal substrate, and application required.
   a. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Material Preparation: Carefully mix and prepare coating materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.
2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into the material. Remove film and, if necessary, strain coating material before using.
3. Use only the type of thinners approved by manufacturer and only within recommended limits.
4. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

B. General: Apply high-performance coatings according to manufacturer's written instructions.
1. Use applicators and techniques best suited for the material being applied.
2. Do not apply high-performance coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
3. Coating surface treatments, and finishes are indicated in the coating system

descriptions.

4. Provide finish coats compatible with primers used.
5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, grilles, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
   1. The number of coats and film thickness required is the same regardless of application method.
   2. Completed Work: Match approved Samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

3.4 FIELD QUALITY CONTROL

A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:
   1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
   2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove non-complying paint from Project site, pay for testing, and repaint surfaces previously coated with the non-complying paint. If necessary, Contractor may be required to remove non-complying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

A. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing, or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

C. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces.

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

Please delete this page prior to issuance.

- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2023-01-06 – Corrected signage material.
- 2025-01-31 – Corrected references. Revised language for Gravotech-type signs.
- 2025-11-11 – Updated from CBC 2022 to CBC 2025 as applicable

DISTRICT DESIGN STANDARDS

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In many cases, the District does not govern the technical 3-part specifications for the Design Team. The design standards information shown below is provided to convey the District's intentions on manufacturers, products and procedures that the District does or does not want to be used on their projects. The items listed below are to assist you with understanding what needs to be reflected in your 3-part specification without forcing a pre-written specification upon you. Where a 3-part specification section is provided by the District, the items below are design parameters to be considered when applying this specification section to your design. The design team shall confirm and coordinate all product and system requirements with the District during design regardless of them being design standards or full 3-part specifications.

When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

Please delete this page prior to issuance.

All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- District requires that all room identification signs are made using the Gravotac material. Please do not stray from this.
- There are numerous other materials that should be used for site signage. Designer shall modify these materials and options to fit specific projects.

SECTION 10 14 00

SIGNAGE

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Plastic signs at building entrances, classrooms, restrooms, and as identified on drawings.

B. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 08 11 00 – Metal Doors.
3. Section 08 14 00 – Wood Doors.
4. Section 09 29 00 – Gypsum Board.

1.02 REFERENCES

A. Accessible signs shall conform with the following requirements as indicated:

1. California Building Code (CBC) Title 24, 2025~~2~~ Edition.
2. ADA Accessibility Guidelines (ADAAG, latest adopted edition).
3. Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required (CBC Section 11B-703.3 Braille).
4. Means of Egress Identification: CBC 11B-216.4~~1~~ &11B-703.1.
5. Tactile Exit Signs: CBC 1013.4.
6. Restroom Identification Symbols: CBC 11B-216.8 &11B-703.7.2.6.
7. Signs and Identification: CBC 11B-216.1 &11B-703.1.
8. International Symbol of Accessibility: CBC 11B-703.7.2.1.
9. Direction and Information Signs: CBC 11B-703.1.
10. Symbols of Accessibility: CBC 11B-703.7.
11. Finish and Contrast: CBC 11B-703.5.1.
12. Character Proportions: CBC 11B-703.2.4.
13. Character Height: CBC 11B-703.2.5.
14. Raised Characters and Pictorial Symbol Signs: CBC 11B-703.2 & 11B-703.6.
15. Braille: CBC 11B-703.3.
16. Mounting Height and Location: CBC 11B-703.4.1 & 11B-703.4.2.
17. Symbols of Accessibility: CBC 11B-703.7.2.
18. Color of Symbol: CBC 11B-703.7.2.1.
19. Entrance Signs: CBC 11B-216.6.

Commented [JR1]: No changes in CBC 2025 to these sections numbering

B. ASTM D4802-16(2024) - Standard Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet.

C. ASTM B209-21a - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

D. ASTM B221-21 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

E. ASTM A666-24 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless-Steel Sheet, Strip, Plate, and Flat Bar.

1.03 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Shop drawings listing sign styles, lettering and locations and overall dimensions of each sign.

B. Two (2) samples illustrating full size sample sign with tactile characters, Braille and subsurface text or pictogram to demonstrate fabrication technique and Braille measurements which shall be used on proposed project.

C. Letters samples: 1-inch-high letters for proportions required in REGULATORY REQUIREMENTS.

D. Submit manufacturer's technical data and installation for each type of sign required.

E. Submit samples of background colors, character colors, and one-inch high print outs of "I," "O" and "X" from proposed type styles. Indicate which type styles shall be used for required tactile characters and for required visual characters.

F. Submit proposed sign schedule to comply with scoping requirements above.

G. All signage shall be designed and constructed to comply with signage specifications and drawings.

1.04 QUALITY ASSURANCE

A. Pre-installation Meeting

1. Notify Architect when signs are ready for installation. Arrange for conference at job site. Do not proceed with installation until Architect's approval of specific locations and methods of attachment has been obtained.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site and protect from damage. Store until immediately prior to Notice of Completion.

B. Manufacturers shall submit 3 references showing products for projects completed within the last 6 years. Both tactile and non-tactile signage shall be included in the work.

C. Manufacture's Two-Year Warranties.

D. Contractor shall provide labor and materials to repair or replace defective signs as directed by Owner. Defects shall include:

1. Tactile characters and/or Braille dots which come off or are removed.
2. Discoloration, wear and scratching off of the surface color.
3 All signs and sign components, except for damage by mishandling by Owner, including installation by Owner, or vandalism.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.

1. Gravotech. www.gravotech.com
2. Or approved equal with direct compatibility with District-owned Gravotech engraving equipment and surplus engraving materials for sign types specified as "Modular".

2.02 MATERIALS

A. Modular Acrylic Framed Signs:
1. Modular sign panels mounted in permanently fixed frames with sign panels capable of being removed and replaced.
2. ADA Tactile and Braille Signs: Sand-Carved signs; thermosetting high-pressure laminate using Graphic Process Sand-Carved signs, exterior-grade, graphics, Braille and tactile copy required. Square corners, square cut edges, matt finish using **Gravotac** sheet engraving materials as manufactured by Gravotech.
   a. Frame: Single-piece, square-edge modular plastic frames with concealed screw mounting by Gravotech. Color as selected by Architect at time of submittal.
   b. ADA TactManufacturer's standard process for producing copy complying with CBC and ADA Accessibility Guidelines. Text shall be accompanied by California Grade 2 Braille. Produce precisely formed characters with square cut edges free from burrs and cut marks, permanently fused to substrate.
   c. Raised-Copy Thickness: Not less than 1/32 inch.

B. Non-Tactile, Non-Modular Signs:
1. Cast Acrylic Plastic Sheet; ASTM D4802-16(20240) Category A-1, ¼ inch overall thickness, laminated acrylic plastic sheets, sub-surface screened process graphics and symbols, exterior-grade at exterior locations, square 3/8-inch radius corners, square cut edge, drilled holes for countersunk screws, polished edges.

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a. Unframed Signs

2. Apply UV inhibitor overcoat for exterior signs.

C. Restroom Signage
1. Male Restroom Signage:
   a. Doorways leading to male restrooms shall be identified by equilateral triangle 1/4 inch thick matte finished colored acrylic polymer material, with edges 12 inches long, with vertex pointing upward in contrasting color from door color. Sign shall be mounted in center of door 60 inches from finish floor to center of sign.
   b. Room shall be further identified by rectangular room identification sign 1/4 inch thick matte finished colored acrylic polymer material, 8 inch height by 6 inch length minimum unless indicated on Drawings upon which appears a male pictogram 6 inches high, and the word "MEN" immediately below on the same sign in contrasting color. Letters: 5/8 inches minimum and 2 inches maximum high in contrasting color, raised minimum 1/32 inch fully tactile, accompanied by the California Contracted Grade 2 Braille indicator immediately below. Sign shall be located on wall on latch side of door, 60 inches from finish floor to center of sign, centered horizontally within 18-inch space adjacent to latch side of door or on nearest adjacent wall.
   c. Conform to all CBC requirements, CBC 11B.703.1 and 11B-703.7.2.6.1.

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5. Female Restroom Signage:
   a. Doorways leading to female restrooms shall be identified by circle 1/4 inch thick matte finished colored acrylic polymer material, 12 inches in diameter circle in contrasting color from door color. Sign shall be mounted in center of door, 60 inches from finish floor to center of sign.
   b. Room shall be further identified by rectangular room identification sign 1/4 inch thick matte finished colored acrylic polymer material, 8-inch Height by 6-inch Length minimum unless indicated on Drawings upon which appears a female pictogram 6 inches high, and the word "WOMEN" immediately below on the same sign in contrasting color. Letters: 5/8 inches minimum and 2 inches maximum high in contrasting color, raised minimum 1/32 inch fully tactile, accompanied by the California Contracted Grade 2 Braille indicator immediately below. Sign shall be located on wall on latch side of door, 60 inches from finish floor to center of sign, centered horizontally within 18-inch space adjacent to latch side of door or on nearest adjacent wall.
   c. Conform to all CBC requirements, CBC 11B.703.1 and 11B-703.7.2.6.2.

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6. Gender Neutral Restroom:
   a. Doorways leading to unisex restrooms shall be identified by circle 1/4 inch thick matte finished colored acrylic polymer material, 12 inches in diameter with 1/4-inch-thick triangle superimposed on circle and within 12-inch diameter, total 1/2 inch thick in contrasting color from door color. Sign shall be mounted in center of door 60 inches from finish floor to center of sign. Color of triangle shall have 70 percent minimum contrast with color of circle.
   b. Room shall be further identified by rectangular room identification sign 1/4 inch thick matte finished colored acrylic polymer material, 8-inch Height by 6-inch Length minimum unless indicated on Drawings upon which appear as male and female pictograms and the word

"RESTROOM" immediately below on the same sign in contrasting color. Letters: 5/8 inches minimum and 2 inches maximum high in contrasting color, raised minimum 1/32 inch fully tactile, accompanied by California Contracted Grade 2 Braille indicator immediately below, on same sign. The sign shall be located on wall on latch side of door, 60 inches from finish floor to center of sign, centered horizontally within 18-inch space adjacent to latch side of door or on nearest adjacent wall.

c. Conform to all CBC requirement, CBC 11B.703.1 and 11B-703.7.2.6.3.

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7. Restroom signs – Non-Wheelchair Accessible:
   a. Provide restroom signs with similar font, size and fabrication as accessible signs without the ISA (International Symbol of Accessible) and without tactile construction.
   b. Next to the Non-Wheelchair Accessible sign provide an additional sign same construction, with the wording: “WHEELCHAIR ACCESSIBLE RESTROOM LOCATED” with ARROW below the wording directing to the nearest location.

8. [Substitute "BOYS" or "GIRLS" where appropriate.]

D. Aluminum Signs (as needed)

1. Aluminum Sheet for Anodic Finish: Alloy 5005-H32 per ASTM B209-21a in 0.102-inch thickness.
2. Framing Members and Posts: Special extrusions Alloy 6063-T5 per ASTM B221-21.
3. Aluminum sheet with die-raised copy, anodic finish applied before fabrication. Background finish enamel applied after fabrication. Color as selected by Architect from manufacturer's standard range of colors.
4. Fabrication: Raised copy, Tactile and Braille.

E. Stainless Steel Signs (as needed)

1. Stainless-Steel Plate, Sheet, and Strip: Provide stainless-steel plate, sheet, and strip, Type 302 or Type 304, complying with ASTM A-666-24.
2. Fabrication: Raised copy, Tactile and Braille.

F. Chemically Deep-etched Zinc Signs (as needed)

1. Solid metal plate: 0.125 [0.40] [0.064] [0.153] [0.250] inch thick.
2. Fabrication: Raised copy, Tactile and Braille.
3. Finish: matte [semigloss] [gloss] [exterior gloss] sheen.
4. Background: swirl-brushed [sandblast] [painted] [plated] zinc background finish.
5. Factory applied color finishes, minimum two (2) colors. Colors: As selected by Architect.
6. For Sizes and Dimensions verify with Architect.
7. [Rounded corners, 7/16-inch radius.]
8. Square edges.
9. Etch depth: 0.08 inch
10. Concealed Mounting: welded studs [drilled and tapped holes]
11. [Mounting Holes: Drilled and countersunk]>>>

2.03 FABRICATION

A. Regulatory Requirements

1. Tactile Character Type: Tactile characters on signs shall be raised 1/32-inch (0.794 mm) minimum, and shall be sans serif uppercase characters accompanied by Contracted (Grade 2) Braille. Helvetica Regular, uppercase letters only, refer to REGULATORY REQUIREMENTS for letter-proportion compliance. Italic, oblique script, highly decorative or unusual style forms not permitted. CBC Section 11B-703.2. Fabricate sign so that raised letter cannot be peeled off.
2. Character Proportions: Raised characters on signs shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
3. Tactile Character Height: Raised characters shall be a minimum of 5/8 inch (15.9 mm) and a maximum of 2 inches (51 mm) high. CBC Section 11B-703.2.5.
4. Stroke thickness of the uppercase letter "I" shall be 15 percent maximum of the height of the character. CBC Section 11B-703.2.6.
5. Character spacing measured between the two closest points of adjacent raised characters within a message. Where characters have rectangular cross sections, spacing shall be 1/8 inch minimum and four (4) times the stroke width, maximum. Where characters have other cross sections, spacing between individual raised characters shall be 1/16 inch minimum and four (4) times the stroke width maximum at the base of the cross sections, and 1/8 inch minimum and four (4) times the stroke width maximum at the top of the cross sections. Characters shall be separated from raised borders and decorative elements 3/8 inch minimum.
6. Line Spacing: Spacing between the baselines of separate lines of raised characters within a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
7. Finish and Contrast: Characters and their background shall have a non-glare finish. Characters shall contrast with their background. Provide white characters on Navy Blue background to match District standard.
8. Braille: California (Contracted) Grade 2 Braille. Dot base diameter shall be 0.059 inch (1.5 mm) to 0.063 inch (1.6 mm). Dots shall be 0.100-inch (2.5 mm) on center in each cell with 0.300-inch (7.6 mm) space between corresponding dots in ad-jacent cells. Distance between corresponding dots from one cell directly below, 0.395 to 0.400 inch. Dots shall be raised 0.025 to 0.037 inch above the background. Braille dots shall be domed or rounded.
9. Polish all edges.

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PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive Work.

B. Beginning of installation means installer accepts existing surfaces.

3.02 INSTALLATION

A. Install signs only after surfaces are finished, in all restrooms, in center of door, or on wall adjacent to latch side as specified herein.

B. Mounting

1. Mounting Height and Location: Signs with raised characters and Braille shall be located 48 inches minimum to the baseline of the lowest line of Braille cells and 60 inches maximum to the baseline of the highest line of raised characters above the finish floor or ground surfaces. Mounting location shall be located so that a clear space of 18 inch minimum by minimum by 18 inch minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45-degree open position. CBC Section 11B-703.4.
2. Tactile Plastic Signs: Stainless steel screws (not just adhesive), pin torx, vandal-proof screw appropriate for substrate.
3. Non-tactile Plastic Signs:
   a. Install with four (4) stainless steel countersunk flathead screws, pin torx, vandal-proof. Pre-drill holes to prevent breaking plastic, use countersunk drill bits to flush screw head with sign surface.
   b. [Install with clear silicone adhesive meeting ASTM C834-17(2023), with zero clearance between plastic and face of substrate. Double face adhesive tape not permitted].
   c. Metal Signs: Install with four (4) flathead countersunk No. 8 stainless steel vandal-proof screws at pre-drilled holes, top of screw heads shall flush with sign surface, concealed mounting.

C. Fasteners: Stainless steel screws, flat head, pin-in-head torx screws for vandal-proof and clear silicone adhesive.

D. Clean and polish.

3.03 FIELD QUALITY CONTROL

A. DSA Inspections: Signs and identifications or other information shall be field inspected after installation and approved by Division of the State Architect prior to the issuance of a final certificate of occupancy, or final approval where no certificate of occupancy is issued. The inspection shall include, but not limited to, verification that Braille dots and cells are properly spaced and the size, proportion and type of raised characters are in compliance with CBC, Section 11B-703.1.1.2.

Commented [JR9]: ok

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END OF SECTION

REVISION SUMMARY

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- Urinal screens are not generally required by District at student toilet rooms.

SECTION 10 21 13

TOILET COMPARTMENTS AND CUBICLES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Toilet Compartments.
2. Urinal Screens.
3. Shower Dividers.
4. Dressing Compartments.

B. Related Sections

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 06 10 00 – Rough Carpentry.
3. Section 03 30 00 – Cast-In-Place Concrete.
4. Section 05 50 00 – Metal Fabrications
5. Section 10 28 00 - Washroom Accessories.

1.02 REFERENCES

A. National Fire Protection Association 101 Life Safety Code, Chapters 5, 6, 8-30.

B. ANSI A117.1: Accessible and Usable Buildings And Facilities.

Commented [JR1]: Ok

C. Title 24, California Code of Regulations, Parts 2, 3, and 5.

D. ADA, Accessibility Guidelines for Buildings and Facilities, Federal Register Volume 56, Number 144, Rules and Regulations.

E. US Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Program.

F. American Society for Testing and Materials Standards:

1. ASTM E84-24 Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM D2794-93(2024) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
3. ASTM D2197-16(2002) Standard Test Method for Adhesion of Organic Coatings by Scrape Adhesion.
4. ASTM D6578-13(2004) Standard Practice for Determination of Graffiti Resistance.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements

1. Graffiti Resistance: Partition material shall have the following graffiti removal characteristics when tested in accordance with ASTM D6578-13(2024)~~00~~ Standard Practice for Determination of Graffiti Resistance in accordance with Section 9, "Graffiti Removal Procedure Using Manual Solvent Rubs":
   a. Cleanability: Five (5) required staining agents shall be cleaned off material.

2. Scratch Resistance: Partition material shall have the following characteristics when tested in accordance with ASTM D2197-16~~98~~(2020~~0~~2) Standard Test Method for Adhesion of Organic Coating by Scrape Adhesion, using Gardner Stock #PA-2197/ST pointed stylus attachment on scrape tester:
   a. Scratch Resistance: Maximum Load Value shall exceed 10 kilograms.

3. Impact Resistance: Partition material shall have the following characteristics when tested in accordance with ASTM D2794-93(2024~~1999~~)~~e1~~ Standard Test Method for Resistance of Organic Coating to the Effects of Rapid Deformation (Impact), using .625" hemispherical indenter with 2-lb impact weight:
   a. Impact Resistance: Maximum Impact Force value shall exceed 30 inch-lbs.

4. Fire Resistance: Partition material shall comply with the following requirements, when tested in accordance with ASTM E-84-24: Standard Test Method for Surface Burning Characteristics of Building Materials:
   a. Smoke Developed Index: Not to exceed 450.
   b. Flame Spread Index: Not to exceed 75.
   c. Material Fire Ratings:
      1) National Fire Protection Association (NFPA): Class B.
      2) International Code Council (ICC): Class B.

1.04 SUBMITTALS

A. Comply with requirements of Section 01 33 00.

B. Manufacturer's Data.

1. Provide required number copies of:
   a. Product data sheets.
   b. Installation instructions.
   c. Cleaning and maintenance instructions.
   d. Replacement parts information.

C. Shop Drawings.

1. Provide required number of copies of all shop drawings.

2. Show fabrication and erection of compartment assemblies, to extent not fully described by manufacturer's data sheets.
3. Show anchorage, accessory items and finishes.
4. Provide location drawings for bolt hole locations in supporting members for attachment of compartments.

D. Samples.

1. Furnish scale model of compartments, including stile, shoe, door, door hardware, divider panel, and mounting brackets.
2. Furnish sections showing stile anchoring and leveling devices, concealed threaded inserts, panel, stile, and edge construction.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver items in manufacturer's original unopened protective packaging.

B. Store materials in original protective packaging to prevent physical damage or wetting.

C. Handle so as to prevent damage to finished surfaces.

1.07 WARRANTY

A. Furnish ten-year limited warranty for panels, doors, and stiles against breakage, corrosion, delamination, and defects in factory workmanship.

B. Furnish one-year guarantee against defects in material and workmanship for stainless steel door hardware and mounting brackets.

1.08 ATTIC STOCK

A. Provide two additional latches and associated hardware per toilet room included in scope of work.

B. Provide one additional 12-inch-wide style per toilet room included in scope of work.

C. Provide one additional 36-inch-wide stall door per toilet room included in scope of work.

PART 2 - PRODUCTS

2.01 MANUFACTURER (DISTRICT STANDARD)

A. Model numbers for toilet partitions manufactured by Bobrick Washroom Equipment, Inc., represented by R. E. Edwards & Associates (925-829-2942), are listed to establish a standard of quality for design, function, materials, workmanship, and appearance. Other manufacturers may be submitted for evaluation by the architect by following the conditions of the substitutions clause.

Unless approval is obtained ten days prior to the bid date, all bids shall be based on the standard of quality. The architect shall be the sole judge as to the acceptability of all products submitted for substitution.

B. Toilet partitions shall be the product(s) of a single manufacturer.

2.02 MOUNTING CONFIGURATIONS

A. Toilet Partitions/Shower Dividers/Dressing Compartments shall be:

1. Overhead-Braced (1092.67 Sierra™ Series)

B. Urinal Screens shall be:

1. Floor-Anchored (1091 Sierra Series):
   - or -
   Post-to-Ceiling (1093 Sierra Series)
   - or -
   Wall-Hung (1095 Sierra Series)

2.03 COMPONENTS/MATERIALS

A. Stiles, Panels, Doors, and Screens shall be all be manufactured from Solid Color Reinforced Composite material.

B. Toilet Partition Material

1. Toilet partitions shall be constructed of Solid Color Reinforced Composite material, which is composed of dyes, organic fibrous material, and polycarbonate/phenolic resins. Material shall have a non-ghosting, graffiti-resistant surface integrally bonded to core through a series of manufacturing steps requiring thermal and mechanical pressure. Edges of material shall be the same color as the surface.
2. Subject to compliance with the material performance requirements, toilet partitions manufactured by others may be constructed from Solid Surface materials including, but not limited to:
   a. Dupont Corian Privacy Plus Partitions.
   b. WilsonArt Solid Surface.

3. Toilet partitions constructed of High-Density Polyethylene (HDPE) or High-Density Polypropylene will not be acceptable.

C. Finish Thickness

1. Stiles and doors shall be 3/4" (19 mm).
2. Panels and benches shall be 1/2" (13 mm).

D. Hardware

1. All hardware shall be Bobrick "1092.67DS Optional Institutional Hardware". Where Specifications and/or Drawings conflict with Bobrick "1092.67 Optional Institutional Hardware" requirements, the Bobrick "1092.67 Optional Institutional Hardware" requirements shall prevail.

2. Provide optional Door Plate Bobrick Part No. 1002510 at top and bottom of each partition door.
3. All hardware to be 18-8, type-304 stainless steel with satin finish.
4. Hardware of chrome-plated "Zamak", aluminum, or plastic is unacceptable.

E. Latch

1. Sliding door latch shall be 14 gauge (2 mm) and shall slide on nylon track.
2. Sliding door latch shall require less than 5-lb force to operate. Twisting latch operation will not be acceptable.
3. Latch track shall be attached to door by machine screws into factory-installed threaded brass inserts.
4. Threaded brass inserts shall be factory installed for door hinge and latch connections and shall withstand a direct pull exceeding 1,500 lbs. per insert.
5. Through bolted, stainless steel, pin-in-head Torx sex bolt fasteners shall be used at latch keeper-to-stile connections and shall withstand direct pull force exceeding 1,500 lbs. per fastener.

F. Hinges

1. Hinge shall be 16-gauge (1.6-mm) continuous piano hinge.
2. All doors shall be equipped with self-closing hinge.
3. Continuous piano hinge shall be attached to door and stile by theft-resistant, pin-in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts
4. Fasteners secured directly into the core are not acceptable.
5. Door shall be furnished with two 11-gauge (3-mm) stainless steel door stop plates with attached rubber bumpers to resist door from being kicked in/out beyond stile.
6. Door stops and hinges shall be secured with stainless steel, pin-in-head Torx machine screws into threaded brass inserts.
7. Threaded brass inserts shall withstand a direct pull force exceeding 1,500 lbs per insert.

G. Mounting Bracket

1. Mounting brackets shall be 18-gauge (1.2- mm) stainless steel and extend full height of panel.
2. U-channels shall be furnished to secure panels to stiles.
3. Angle brackets shall be furnished to secure stiles to walls and panels to walls.
4. Fasteners at locations connecting panels-to-stiles shall utilize through bolted, stainless steel, pin-in-head Torx sex bolt fasteners. Through-bolted fasteners shall withstand direct pull force exceeding 1,500 lbs. per fastener.
5. Wall mounted urinal screen brackets shall be 11 gauge (3 mm) double thickness.

H. Leveling Device shall be 7-gauge, 3/16" (5-mm) hot rolled steel bar; chromate-treated and zinc-plated; through-bolted to base of solid color reinforced composite stile.

I. Stile Shoe shall be one-piece, 4" (102-mm) high, type-304, 22-gauge (0.8-mm) stainless steel with satin finish. Top shall have 90° return to stile. Shoe will be composed of one-piece of stainless steel and capable of being fastened (by clip) to stiles starting at wall line.

J. Headrail (Overhead Braced) shall be satin finish, extruded anodized aluminum (.125" / 3-mm thick) with anti-grip profile.

K. Full-Height Post: At all partition panels over 5'-0" in unsupported length, provide a full-height 1-1/4"x1-1/4" stainless-steel post, Bobrick Part No. 1000070 and Anchor Package Part No. 1002703. Provide floor and ceiling saddles. Fasteners into concrete floor shall be stainless steel. The panel shall be anchored to post to help eliminate side to side flex of the panel. At locations where post is taller than 8'-0" and/or is in a high vandalism area, provide custom stainless steel post with slip-joint as detailed on drawings.

L. Grab Bar Anchors for Toilet Partitions: At all locations as shown on drawings where grab bars are mounted on partition system, provide Bobrick 2586 Series stainless steel backing plate.

G. Coat Hook

1. Coat Hook shall Bobrick Model B-233 and be constructed of stainless steel and shall project no more than 1-1/8" (29 mm) from face of door.
2. Coat hook shall be secured by to door by through-bolted, theft-resistant, pin-in-head Torx stainless steel screws. Through-bolted fasteners shall withstand a direct pull force exceeding 1,500 lbs. per fastener.
3. Coat Hook shall act as door bumper on in-swing doors.
4. Mounting height = 48" maximum above finished floor.

H. Door Pull: Accessible stall door shall have a compliant loop or U-shaped door pull on inside and outside of door immediately below latch.

I. Door Bumpers: Provide wall door bumper for all doors where partition door will impact wall finish. Wall bumper shall be equal to Trimco, Model No. 1270CVPV. Mount on wall at height to match partition door handle.

2.04 FABRICATION

A. Vandal-Resistant Hardware Option: for Institutional Hardware option add suffix .67 to 1092 Series.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Check areas scheduled to receive compartments for correct dimensions, plumbness of walls, and soundness of surfaces that would affect installation of mounting brackets.

B. Verify spacing of plumbing fixtures to assure compatibility with installation of compartments.

C. Do not begin installation of compartments until conditions are satisfactory.

3.02 ERECTION

A. Install compartments rigidly, straight, plumb, and level and in accordance with manufacturer's installation instructions.

B. Installation methods shall conform to manufacturer's recommendation for backing and proper support.

C. Conceal evidence of drilling, cutting, and fitting to room finish.

D. Maintain uniform clearance at vertical edge of doors.

F. Attach panel brackets securely to walls using anchor devices. All anchors shall be into solid wood blocking. No plastic expansion sleeves will be accepted.

G. Attach panels and pilasters to bracket with through-sleeve tamperproof bolts and nuts.

H. Anchor urinal screen panels to walls with continuous panel brackets. At free end, provide full-height post as noted in Paragraph 2.03-K.

I. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster. Conceal floor fastenings with pilaster shoes.

J. Equip each door with one hinge, one door latch, and one coat hook and bumper.

K. Install door strike and keeper with door bumper on each pilaster in alignment with door latch.

L. Adjust hinges to locate doors in partial opening position when unlatched. Return outswing doors to close position.

M. Contractor shall install backing/blocking as required for secure attachment.

N. Confirm all locations of full-height post and provide blocking in ceiling space. Contractor shall open ceiling as required to install 4x4 blocking for attachment of post.

O. At locations of grab bars mounted on partition system, Contractor shall carefully measure and drill panels for grab bar anchors.

P. Where full-height stainless steel brackets extend above ceramic tile wainscot, provide plywood shim between wall and bracket to act as spacer. Shim shall be narrower than brackets to allow for sealant joint. After shim installation, provide sealant joint between wall and bracket to completely enclose edge of plywood.

3.03 ADJUSTMENT AND CLEANING

A. Adjust hardware for proper operation after installation.

B. Set hinge cam on in-swinging doors to hold doors open when unlatched.

C. Set hinge cam on out-swinging doors to hold unlatched doors in closed position.

D. Clean exposed surfaces of compartments, hardware, and fittings.

E. Remove protective maskings. Clean surfaces.

F. Field touch-up of scratches or damaged enamel finish will not be permitted.

G. Replace damaged or scratched materials with new materials.

END OF SECTION

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

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- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2022-12-18 – Revised the make and model of the hand dryer.
- 2025-01-31 – Minor edits to code references.
- 2025-11-11 – Updated from CBC 2022 to CBC 2025 as applicable. Updated list of District accepted accessories.

DISTRICT DESIGN STANDARDS

Notice to All Users and Designers!

In many cases, the District does not govern the technical 3-part specifications for the Design Team. The design standards information shown below is provided to convey the District's intentions on manufacturers, products and procedures that the District does or does not want to be used on their projects. The items listed below are to assist you with understanding what needs to be reflected in your 3-part specification without forcing a pre-written specification upon you. Where a 3-part specification section is provided by the District, the items below are design parameters to be considered when applying this specification section to your design. The design team shall confirm and coordinate all product and system requirements with the District during design regardless of them being design standards or full 3-part specifications.

When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

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All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- None at this time.

SECTION 10 28 00

TOILET, BATH, AND WASHROOM ACCESSORIES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Toilet and bath, shower, and washroom accessories.
2. Framed mirror units.
3. Concealed anchor devices and backing plate reinforcements furnished to other Sections.
4. Attachment hardware.

B. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 09 29 00: Gypsum Board.
3. Section 10 21 13: Toilet Compartments and Cubicles.

1.02 REFERENCES

A. ADAAG - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities.

B. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.

C. ASTM A123-24 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

D. ASTM B456-17(2022) - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

E. ASTM A269-24 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

1.03 SUBMITTALS

A. Submit product data under provisions of Section 01 33 00. Provide product data on accessories describing size, finish, details of function, attachment methods.

C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements

1. Conform to CBC, California Building Code, (CCR) Title 24, Part 2, and ADAAG or accessibility requirements.
2. Structural strength of grab bars, shower seats, fasteners and mounting devices shall conform to requirements of the CBC, California Building Code, (CCR) Title 24, Part 2, Section 11B-1009.5.71115B.8.3 and shall withstand the application of a 250 lb. point load.

B. Coordination

1. Coordinate the work of this Section under provisions of Section 01 31 00.
2. Coordinate the work of this Section with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. A. Bobrick Washroom Equipment, Inc., www.bobrick.com. (District standard).

B. Georgia Pacific. (District standard).

Hillyard. (District standard).

C.

B. American Specialties, Inc. (ASI), www.americanspecialties.com.

C. Bradley Corporation, www.bradleycorp .com.

D. Deb.

D. E. EXCEL Dyer.

A. HOSPECO.

E.

F. TORK.

G. SSubstitutions: Under provisions of Section 01 33 00.

F.

2.02 MATERIALS

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A. Sheet Steel.

B. ~~B.~~ Stainless Steel Sheet: Type 304.

C. Plastic/polycarbonate.

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~~C~~D. Tubing: ASTM A269-24, stainless steel, Type 304.

~~D~~E. Adhesive: Two component epoxy type waterproof.

~~E~~F. Fasteners, Screws, and Bolts: Hot dip galvanized, tamperproof.

~~F~~G. Expansion Shields: Fiber, plastic~~lead~~, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FABRICATION

A. Weld and grind smooth joints of fabricated components.

B. Form exposed surfaces from single sheet of stock, free of joints.

C. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

D. Back paint components where contact is made with building finishes to prevent electrolysis.

E. Shop assemble components and package complete with anchors and fittings.

F. Provide steel anchor plates, adapters, and anchor components for installation:

G. Hot dip galvanize exposed and painted ferrous metal and fastening devices.

H. Toilet tissue dispensers located in accessible toilet rooms or stalls shall not have their flow restricted and shall be capable of continuous flow.

2.04 FINISHES

A. Galvanizing: ASTM A123-24 to 1.25 oz/sq yd.

B. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.

C. Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats electrostatic baked enamel.

D. Chrome/Nickel Plating: ASTM B456-17(2022), Type SC 2 satin finish.

E. Stainless Steel: No. 4 satin luster finish.

F. Mirror Glass: FS DD-G-451 Type I, Class 1, Quality of 2, 1/4 inch thick with silver coating, copper protective coating and non-metallic paint coating complying with FS DD-M-411.

G. Stainless Steel Mirror: Type 430, 20 gage, bright annealed stainless steel.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that site conditions are ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site at appropriate time for building-in.

B. Provide templates and rough-in measurements as required.

C. Verify exact location of accessories for installation.

3.03 INSTALLATION

A. Install fixtures, accessories and items in accordance with manufacturers' instructions.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Accessories required to be accessible shall be mounted at heights according to CBC Section 11B-603 and as indicated on the drawings.

D. Toilet paper dispensers and feminine napkin dispensers located on the grab bar side of an accessible toilet room or stall shall not project more than 3 inches from the finished surface of the wall nor be located closer than 1-1/2 inches clear of the tangent point of the grab bar.

E. Contractor shall install all necessary blocking, backing, and recessed openings for all toilet accessories.

F. At locations where grab bars are mounted to toilet partition material, provide optional anchor device, Bobrick #2586 at each flange.

G. Toilet Seat Cover Dispensers: Provide at staff toilet rooms or stalls, and at gender neutral toilet rooms only. Do not provide at student toilet rooms or stalls.

H. Sanitary Napkin Disposal: Provide at staff toilet rooms or stalls, at gender neutral toilet rooms, high school girls toilet rooms, and middle school girls toilet rooms.

I. Hand Dryers: Extend power to location of hand dryer and provide necessary backbox for connection. Provide in-wall blocking for unit support.

J. Keying Accessories

1. Supply two keys for each accessory to Owner.
2. Master key all accessories.

3.04 SCHEDULE

(Designers! Modify schedule below as required for your specific project. For other equipment not shown below, select from same product line.)

~~A. Grab bars B-6808 Length as required~~
~~B. Toilet Paper Dispenser B-2888 Surface mount~~
~~C. Toilet Paper Dispenser B-3888 Semi-recessed~~
~~D. Feminine Napkin Disposal B-270 Surface mount~~
~~E. Feminine Napkin Dispenser B-2706 Surface Mount for modernization projects~~
~~F. Feminine Napkin Dispenser B-3706 Semi-Recessed for new construction projects~~
~~G. Soap Dispenser #91628 Black Proline Curve Dispenser Green Tip~~
~~H. Soap Dispenser Foam Soap #32084 SC Johnson Professional Stoko Refresh 800ml Refill~~
~~I. Electric Hand Dryer #XL-W XLERATOR, 120V. Provide at multi-use toilet rooms~~
~~J. Hand Dryer Recess Kit #40502 ADA-Compliant Recess Kit~~
~~K. Hand Dryer Wall Guard #89S Stainless Steel~~
~~J. Paper Towel Dispenser #5510282 Tork Matic. Provide at staff toilets & clsrm. sinks~~
~~K. Mirror(non-tilt) B-290 Minimum size 18 inches x 36 inches~~
~~L. Toilet Seat Cover Dispenser B-221 Provide at staff toilet rooms~~

A.	Grab bars	Bobrick B-6808	Length as required
B.	Toilet Paper Dispenser	Georgia Pacific #56788	Surface mount, 4-roll rotary @ standard stalls
C.	Toilet Paper Dispenser	Georgia Pacific #56784A	Surface mount, 2-roll @ accessible stalls and staff
D.	Feminine Napkin Disposal	Hospeco 250-201W	Surface mount
E.	Feminine Napkin Dispenser	Hospeco EV1-FREE	Surface Mount
F.	Soap Dispenser	Hillyard #HIL22304	Affinity Expressions manual dispenser 1250ml. Black
G.	Soap Dispenser Repl. Cartridge	Hillyard #HIL0039003	Affinity, Green Select Foam Soap 1250ml
H.	Electric Hand Dryer	EXCEL #XL-W	XLERATOR, 120V. Provide at multi-use toilet rooms
I.	Hand Dryer Recess Kit	EXCEL #40502	ADA-Compliant Recess Kit
J.	Hand Dryer Wall Guard	EXCEL #89S	Stainless Steel
K.	Paper Towel Dispenser	Georgia Pacific #59589	Mechanical. Provide at staff toilets & clsrm. sinks
L.	Mirror(non-tilt)	Bobrick B-290	Minimum size 18 inches x 36 inches
M.	Toilet Seat Cover Dispenser	Georgia Pacific #57748	Provide at staff toilet rooms

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SECTION 10 75 16

GROUND-SET FLAGPOLES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 0 Specification sections, apply to this Section.

1.02 SECTION INCLUDES

A. Aluminum flagpoles.

B. Flags.

1.03 SUBMITTALS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

B. Product Data: For each type of flagpole indicated. Include installation instructions and recommended foundation design.

C. Closeout Submittals

1. O & M Manuals: Maintenance and cleaning instructions

2. Guarantee: Provide in complete form per Division 0, General Conditions.

D. Shop Drawings: Submit complete shop drawings for all materials or furnishings requiring field or shop fabrication.

1.04 QUALITY ASSURANCE

A. Review: All equipment shall be reviewed for conformance with the intent of the Contract Documents and accepted by the contractor prior to installation. All components shall be in a new, "first-class" condition, per the discretion of the District's Representative, prior to Final Acceptance.

B. Source Limitations: Obtain each flagpole as a complete unit, including fitting, accessories, bases, and anchorage devices, from a single manufacturer.

C. Integrated lighting shall be considered as part of an integral system from a single manufacturer.

1.05 GUARANTEE

A. Provide in required form for a period of 1 year from date of acceptance by Owner.

1.06 DELIVERY, STORAGE AND HANDLING

A. Store and handle acceptable to the District's Representative and so that work or access of others is not impeded.

B. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 – PRODUCTS

2.01 FLAGPOLES

A. General: Manufacturer’s standard tapered aluminum flagpole, with all hardware, accessories, trim pieces, footing and anchorage for a complete, finished installation.

B. Acceptable products:

a. Item Number ESR35D72-AA as manufactured by
Colonial Flag.
1-877-941-3524.
www.colonialflag.com

b. Height: 34’-11”.

c. STARGAZER LED Downlight/Internal-External Truck Combo as manufactured by Eagle Mountain Flag. External revolving truck. Provide separate wall mount power supply. Provide dusk-to-dawn photocell.

d. No known equals exist with integral lighting. Products with integral lighting will be considered for substitution per the requirements of Division 1, General Conditions.

C. Alternate Products: Proposed equals are subject to the substitution process per applicable Sections of Division 1, General Requirements. Alternate products may be submitted as substitution requests. However, it is the Contractor's responsibility to prove that it is an “or equal" product, and the District Representative shall be the final authority.

D. Accessories: Manufacturer’s standard gold anodized aluminum top finial ball, single-sheave cast aluminum truck, No. 10 braided polypropylene rope halyard, tapered 6063-T6 aluminum alloy tube, lockable hasp box, spun aluminum flashing collar and ground set tube.

E. Finishes:

a. Manufacturer's clear anodized finish on all surfaces.
b. Seal aluminum surfaces with clear, hard-coat wax.

F. Concrete: Refer to Section 32 16 00.

2.02 FLAGS

A. Provide (1) one each American Flag and California State Flag. Flags shall be 5' x 8', 100% nylon fiber, with individually sewn and embroidered stripes, stars and graphics. Edges shall be fully hemmed and sewn with brass grommets at hanging end.

PART 3 – EXECUTION

3.01 SEQUENCING AND SCHEDULING

A. Coordinate construction timing of installation in conformance with all other work.

3.02 INSTALLATION

A. Concrete Footings: Install as shown in Drawings.

B. Equipment: Conform to layout shown on Drawings. Install all components in strict conformance with referenced Standards, Details, accepted Shop Drawings, and manufacturer's instructions.

C. Provide underground pathway from building to power supply, and from power supply to flagpole. Mount separate photocell at location recommended by manufacturer.

3.03 CLEANING

A. Keep premises free from accumulation of waste and debris. At completion of installation remove all debris and clean adjacent surfaces as required.

B. At completion clean exposed surfaces in a manner that will not damage finish.

[END OF SECTION 10 75 16]

REVISION SUMMARY

Notice to All Users and Designers!

The following revision dates summarize significant changes included in this specification section since the last release. The revisions summarized below are included in this section.

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- 2022-09-30 - Section revised for format, standards check, reorganized to fit CSI Section Format Outline.
- 2025-01-31 – Added a 3-part spec for vinyl curtains to this section.
- 2025-11-11 – Updated from CBC 2022 to CBC 2025 as applicable

DISTRICT DESIGN STANDARDS

Notice to All Users and Designers!

In many cases, the District does not govern the technical 3-part specifications for the Design Team. The design standards information shown below is provided to convey the District's intentions on manufacturers, products and procedures that the District does or does not want to be used on their projects. The items listed below are to assist you with understanding what needs to be reflected in your 3-part specification without forcing a pre-written specification upon you. Where a 3-part specification section is provided by the District, the items below are design parameters to be considered when applying this specification section to your design. The design team shall confirm and coordinate all product and system requirements with the District during design regardless of them being design standards or full 3-part specifications.

When provided, the full 3-part specification is intended for new construction work. The design team shall be responsible for modifying this specification as required for repair or modernization work.

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All items highlighted in yellow within the specification shall be coordinated by the design team on a project specific basis. Designer is expected to modify this specification as required to coordinate with the full body of project specific specifications.

- District does not want motorized blinds/shades to be used on project. If designer feels that blinds/shades need to be motorized, they should obtain approval from District.
- District is okay with the use of rolling Mecho-type shades.
- The use of mini-blinds shall be limited to non-abusive locations where students do not have direct contact with blinds. This typically means mini-blinds could be used at higher clearstory windows.
- All seems/edges shall be fully hemmed.

SECTION 12 20 00

WINDOW TREATMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide window curtains and track systems in accordance with project documents and plans.

B. Related specification sections:
   1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
   2. Section 06 10 00 – Rough Carpentry.
   3. Section 09 29 00 – Gypsum Board Assemblies.
   4. Section 09 51 00 – Acoustical Ceilings.

1.2 QUALITY ASSURANCE

A. Provide curtains, track, and hardware from a firm that has specialized in the fabrication and installation of such work for at least five (5) years in projects of similar size and scope.

B. Provide curtains, track, and hardware as complete units produced by a single manufacturer, including the necessary mounting brackets, hardware, fittings, fastenings, and installation.

C. Installation shall be performed by an authorized manufacturer's representative experienced in the installation and maintenance of such assemblies.

1.3 STANDARDS

A. Except as modified by governing codes and contract documents, comply with applicable provisions and recommendations of the following:
   1. Fabrics are able to withstand a temperature of not more than 160° F.
   2. Provide curtains that conform to NFPA 701 Fire Tests for Flame and Resistant Textiles and Films, and California Title 19 regulations.
      a. Identify fabrics with appropriate markings of applicable testing and inspecting agency.

1.4 SUBMITTALS

A. Manufacturer's Data: Include durability, laundry temperature limit, fade resistance, and fire-test response characteristics for each type of curtain fabric indicated.

B. Shop drawings: Submit drawings and a schedule showing layout and configurations, sizes of curtains, number of carriers, anchorage details, and conditions requiring accessories. Indicate dimensions

taken from field measurements. Include details on blocking above ceiling and in walls.

C. Verification Samples: Submit Full-size units of each type of the following products:
   1. Curtains: Submit 12” square swatch (memo) samples illustrating fabric color, pattern repeat, and weave for each fabric specified.
   2. Curtain Track: Submit sample assembly not less than 4” long included a full-size carrier, end cap, and pull out.

D. Maintenance Instructions: Submit manufacturer’s printed instructions for cleaning and maintenance of the products.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Subcontractor shall not install tracks or curtains until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceiling is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for project when occupied for its intended use.

B. Inspect materials at delivery to assure that specified products have been received and are free of damage.

C. Field measurements: Verify dimensions by field measurements before fabrication.

D. Schedule with construction progress to avoid delaying the work.

1.6 WARRANTY

A. Provide a written warranty agreeing to repair or replace fabric curtains, hardware or materials due to faulty workmanship or installation for a period of one (1) year.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Provide curtain system as produced by one manufacturer.

B. Approved manufacturer: ModoMed. 800.258.8817. www.ModoMed.com

C. Or Approved Equal.

2.2 MATERIALS

A. Curtain Fabric: Provide curtains fabricated with the specified materials. No substitutions permitted.
   1. Manufacturer/Mill: As selected by Architect Pattern: Sure-Chek Vinyl without Mesh. 10 gauge

thickness. Width and length as required to fully cover window openings as shown on drawings.
2. Color: Chosen from full line of manufacturer's standard colors.
3. Fabric Width: TBD
4. Repeat: TBD
5. Railroaded/Non-Railroaded: Non-Railroaded.

B. Curtain Track:
1. Classic Track System
   a. Material: Extruded 6063 aluminum 0.06 wall thickness; satin anodized aluminum finish.
   b. Dimensions: ¾ inches high by 1-3/8 inches wide
   c. Provide straight and bent sections as indicated on drawings.
   d. Provide factory fabricated curved track with 12-inch radius bends.
   e. Finish: Satin coat anodized aluminum.
2. Track Accessories:
   a. Splices: Aluminum Splices. (Part No. MTPSPLICE-ALM).
   b. End Caps: Aluminum. (Part No. MTPEND-ALM).
   c. Spool Carriers: 2.5 carriers per linear foot (Part No. MTPCARR-98-S-25).
   d. Snap Out: Aluminum, provide one per each configuration (Part No. MTPSNAP-ALM)

2.3 FABRICATION

A. Fabricate curtains to comply with the following requirements:

B. Fabric to be tabled and squared.

C. Width: Equal to track length from which curtain is hung plus 10% added fullness, but not less than 12" of added fullness.

D. Length: Equal to ceiling to bottom of window sill height minus 2 inches from finished ceiling at top, and plus 6 inches below window sill at bottom.

E. Construction: Double lock stitched to top of curtain fabric, with a 1-1/4" wide triple thick top seam.

F. Grommets: Provide nickel-plated ½" rust-proof grommets inserted in the top hem of mesh at 6" on center.

G. Hem Construction:
1. Top Hem: To be 1-1/2" wide, double thick and double lock stitched to mesh with a 1/2" wide seam.
2. Side and Bottom Hems: not less than 1" wide doube thick and single stitched.
3. All hems and seams to be sewn with 100% mercerized cotton thread. Nylon thread is not acceptable.
4. All seams to be flat with no puckering.

H. Vertical Seams (for non-railroaded fabrics or panel construction only): Not less than ½"

wide, double thick and double stitched.

I. Fabric Railroading: Fabrics are to be railroaded when possible to provide a seamless curtain. All other patterns are to be pattern matched and sewn with vertical seams.

J. Maintenance labels: Each curtain is to have a ModoMed label sewn into the top fabric seam. Label indicates materials meet Standards and Regulations, also indicates the size.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, adjoining construction and conditions under which the work is to be installed. The work shall not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install all materials level and plumb, according to manufacturer's written instructions.

B. Surface Mounted Track: Fasten surface-mounted tracks at intervals of not more than 24 inches and within 4 inches of end of track. Fasten support at each splice and tangent point of each corner. Center fasteners in track to ensure unencumbered carrier operation. Attach track to ceiling as follows:
   1. Mechanically fasten directly to bottom of concrete deck with anchor screws.
   2. Mechanically fasten directly to finished ceiling with toggle bolts.
   3. Mechanically fasten to furring through suspended ceiling with screw and tube spacer.
   4. Mechanically fasten to suspended ceiling grid with screws.

C. Track Accessories: Install end caps, splices, pull outs, carriers, and other accessories as required for a secure and operational installation.

D. Curtain Carriers: Provide curtain carriers adequate for 6 inch spacing along the full length of the curtain.

E. Curtains: Hang curtains on each curtain track. Test for smooth operation of carriers.

3.3 PROTECTION

A. Protect installed products until the completion of the project.

B. Touch-up, repair, or replace damaged products prior to final acceptance by District.

C. Remove debris and clean surfaces per manufacturer's instructions upon completion.

END OF SECTION

SECTION 27 00 00

COMMUNICATIONS BASIC REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section specifies the common administration basic requirements and common methods for all low voltage systems installation work included under Division 27 and 28 (and other Divisions). Where those requirements differ from the requirements of this section, the more stringent shall govern.

1.02 STANDARDS, REGULATIONS, AND CODES REFERENCES

A. The following Standards, Regulations and Codes apply to work specified in the Contract Documents.
   1. Applicable State and Local Codes.
   2. California Building Code and California Electrical Code, Current Editions.
   3. BICSI TDMM (Telecommunications Distribution Methods Manual), 11th Edition 2006.
   4. ANSI/TIA/EIA-568-B.1. Commercial Building Telecommunications Cabling Standard,
   5. ANSI/TIA/EIA-568-B.1-2. Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements, Addendum 2, Grounding and Bonding Specifications for Screened Balanced Twisted-Pair Horizontal Cabling.
   6. ANSI/TIA/EIA-568-B.1-3. Commercial Building Telecommunications Cabling Standard.
   7. ANSI/TIA/EIA-568-B.1-4. Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements, Addendum 4, Recognition of Category 6 and Category Cat 6A and 50 nm Laser-Optimized 50/125 um Multimode Optical Fiber Cabling.
   8. ANSI/TIA/EIA-568-B.1-2. Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components.
   9. ANSI/TIA/EIA-568-B.2-1. Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components, Addendum 1, Transmission Performance Specifications for 4-Pair 100 Ohm Category 6 Cabling.
   10. ANSI/TIA/EIA-568-B.2-10 (draft 2.0). Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components, Addendum 10, Transmission Performance Specifications for 4-Pair 100 Ohm Augmented Category 6 Cabling.
   11. ANSI/TIA/EIA-568-B3.3 Optical Fiber Cabling Components Standard.
   12. TIA-569-B. Commercial Building Standard for Telecommunications Pathways and Spaces.
   13. ANSI/TIA/EIA-606-A. Administration Standard for Commercial Telecommunications Infrastructure.
   14. ANSI/TIA/EIA-607-A. Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.

15. TIA/EIA TSB-67 Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling Systems.
16. TIA/EIA TSB-72 Centralized Optical Fiber Cabling Guidelines.

1.03 DEFINITIONS

A. The following is a list of abbreviations generally used in Divisions 27 & 28:
   1. ADA - Americans with Disabilities Act
   2. AHJ - Authority Having Jurisdiction
   3. ANSI - American National Standards Institute
   4. APWA - American Public Works Association
   5. ASTM - American Society for Testing and Materials
   6. CBC - California Building Code
   7. CEC - California Electrical Code
   8. CFC - California Fire Code
   9. FCC - Federal Communications Commission
   10. HVAC - Heating, Ventilating and Air Conditioning
   11. IEC - International Electro-technical Commission
   12. IEEE - Institute of Electrical and Electronics Engineers.
   13. IETA - International Electrical Testing Association
   14. FM - FM Global
   15. NEMA - National Electrical Manufacturers Association
   16. NFPA - National Fire Protection Association
   17. OSHA - Occupational Safety and Health Administration
   18. UL - Underwriters Laboratories Inc.

B. Provide: To furnish and install, complete and ready for the intended use.

C. Furnish: Supply and deliver to the project site, ready for unpacking, assembly, and installation.

D. Install: Includes unloading, unpacking, assembling, erecting, installing, applying, finishing, protecting, cleaning, and similar operations at the project site to complete items of work furnished by others.

E. Following is a list of commonly used terms:
   1. Active Equipment: Electronic equipment used to develop various WAN and LAN services.
   2. Backbone: A collective term sometimes used to describe the campus and vertical distribution subsystem facilities and media interconnecting service entrances, communications rooms, and communications cabinets.
   3. Bonding: Permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to safely conduct currents likely to be imposed on it.
   4. Cabinet: Wall-mounted modular enclosure designed to house and protect electronic equipment.

5. Cable Tray: Vertical or horizontal open supports, usually made of aluminum or steel, that are fastened to a building ceiling or wall. Cables are laid in and fastened to the trays. A cable tray is not a raceway.
6. Campus: Grounds and buildings of a multi-building premises environment.
7. Channel: The end-to-end transmission path between two points at which application specific equipment is connected; may include one or more links, cross-connect jumper and/or patch cords, and work area station cords. Does not include connections to active equipment.
8. Cross-Connect: Equipment used to terminate and tie together communications circuits.
9. Cross-Connect Jumper: A cluster of twisted-pair conductors without connectors used to establish a circuit by linking two cross-connect termination points.
10. Fiber Optic Distribution Unit (FDU): Cabinet with terminating equipment used to develop fiber optic cross-connect facilities. Also known as LIU.
11. Grounding: a conducting connection to earth, or to some conducting body that serves in place of earth.
12. Hinged Cover Enclosure: Wall-mounted box with a hinged cover that is used to house and protect electrical devices.
13. Horizontal: Pathway facilities and media connecting the MDF or IDF to Telecommunications Outlets.
14. Intermediate Distribution Frame (IDF): Data networking equipment rack and/or location that serves an individual area, floor or building. Downstream from the MDF.
15. Jack: Receptacle used in conjunction with a plug to make electrical contact between communications circuits, e.g., eight-position/eight-contact modular jacks.
16. Link: A transmission path between two points, not including terminal equipment, work area cables, and equipment cables; one continuous section of conductors or fiber, including the connecting hardware at each end.
17. Local Area Network (LAN): Data transmission facility connecting several communicating devices, typically Ethernet and the network is limited to a single campus.
18. Main Distribution Frame (MDF): Initial (main) data network equipment rack and/or location. Only one MDF occurs per site and may serve many downstream IDFs.
19. Media: The type of cable (e.g., twisted-pair, coaxial, or fiber optic) used to provide signal transmission paths.
20. Minimum Point of Entry (MPOE): The location where the service provider hands off connection and responsibility for service to on-premise customer owned equipment.
21. Modular plug: An eight-position, eight-conductor end-of-wire electrical connector used with Category rated cable.
22. Passive Equipment: Non-electronic hardware and apparatus, e.g., equipment racks, cable trays, electrical protection, wiring blocks, FDUs, etc.
23. Patch Cord: A length of copper or fiber cable with connectors on both ends used to join communications circuits at MDF/IDF and end stations.
24. Patch Panel: System of terminal blocks or connectors used with patch cords that facilitate the administration of cross-connect fields.

25. Pathway: Facility for the placement of communications cable. A pathway facility can be composed of several components including conduit, wireway, cable tray, surface raceway, underfloor systems, raised floor, ceiling support wires, etc.
26. Protectors: Electrical protection devices used to limit foreign voltages on metallic communications circuits.
27. Raceway: An enclosed channel designed expressly for holding wires or cables; may either conductive metal or insulating plastic. The term includes conduit, tubing, wireway, underfloor raceway, and surface raceway; does not include cable tray.
28. Rack: An open or enclosed structure, typically made of aluminum or steel, used to mount equipment; usually referred to as an equipment rack. Maybe freestanding and floor mounted or a wall mounted cabinet. Industry standard 19” width spacing.
29. Wiring Block: Punch down terminating equipment used to develop twisted pair cross-connect facilities.

1.04 PRODUCT AVAILABILITY

A. Products with long delivery lead times are to be brought to the attention of the project manager.

1.05 PRODUCT SUBMITTALS

A. See Division 01 Submittals for more requirements

1.06 SUBSTITUTION LIMITATIONS

A. Equivalent product(s) may be considered for substitution for those products specified, however, the equivalent product(s) must be approved, and show demonstrated and documented equivalence to the product(s) specified. Documentation includes, but is not limited to, product samples, data sheets, and actual test data. The request for product substitution, and supporting documentation, must be submitted to the Project Manager/Designer in writing.

B. See Division 01 Substitutions for more requirements

1.07 QUALITY ASSURANCE

A. The Contractor is to conform to requirements of the latest adopted version of the CEC with amendments by local AHJs.

B. The Contractor is to conform to the latest adopted version of the CBC with amendments by local AHJs.

C. The Contractor is to obtain and pay for electrical permits, plan review, and inspections from local AHJs.

D. The Contractor is to furnish products listed by UL or other testing firm acceptable to AHJ.

E. The Contractor is to conform to requirements of the Service Providers (i.e., electric, telephone, broadband and cable television).

F. Contractor Qualifications:

1. The Contractor shall have a minimum of five years' direct experience with the product they are installing. Installation technicians shall be certified and with a minimum of three years' direct experience with the product they are installing.
2. The Contractor shall maintain a local (within 50 miles of District) service facility which stocks spare devices and/or components for servicing systems.
3. The Contractor shall have performed successful installation of at least three projects similar in scope and size. The Contractor must be able to provide project references for these three projects, including scope of work, project type, owner/user contact name and telephone number.
4. For sections requiring installation personnel to be certified by the manufacturer, the Contractor selected for this project shall provide current certificates for all technicians working on the project.
5. The Contractor shall hold and maintain a valid California C-7 or C-10 State Contractors License and can exhibit validity upon request.
6. The Contractor shall provide a list of test equipment proposed for use in verifying the installed integrity of systems installed.
7. The Contractor shall provide the resume for the Contractor's Project Manager and on-site Installation Supervisor who will be assigned to this project.
8. The Contractor shall provide a list of technical product training attended by the contractor's personnel that will install the specified manufacturer system.
9. The Contractor shall provide a list of Sub-Contractor(s) who will assist the Contractor in the performance of this work.

1.08 SEQUENCING AND SCHEDULING

A. For the proper execution of the work, the Contractor shall cooperate with other tradecrafts and contracts as needed.

B. To avoid installation and scheduling conflicts, the Contractor shall thoroughly examine the complete set of Contract Documents and resolve any conflicts with Project Manager/Designer prior to installation.

1.09 SHOP DRAWINGS

A. Shop Drawings: When required by individual Specification Sections, the Contractor shall provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, point-to-point wiring diagrams for all connections, and the like. Refer to individual Specification Sections for additional requirements for the shop drawings.

1.10 WARRANTY

A. The Contractor shall provide an extended manufacturer's warranty on the Backbone and Horizontal Communications systems as specified in other sections of Division 27.

1.11 CLOSE OUT DOCUMENTS

A. The Contractor shall provide final coordination drawings, with as-built information added, which are to be submitted as record drawings at completion of project.

B. Red-Line Drawings. The Contractor shall provide a clean set of Construction Drawings marked in red with the following:
   1. All installation changes and deviations from the Construction Drawings (including all Addendums and change order documents).
   2. All exact routes of installed pathways (sleeves, conduit, surface raceway, etc.).
   3. Exact location of racks, cabinets, control panels, and the like.

C. Operation and Maintenance Documentation: The Contractor shall provide copies of certificates of code authority acceptance (i.e. Fire Alarm IOR), product data, guarantees, warranties, installation guides, maintenance guides and the like.

D. Inspection and/or testing: The Contractor shall submit testing reports for testing that was required.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. The Contractor shall provide like items from one manufacturer, such as wire/cable, jacks, modular plugs, patch panels, equipment connection cords, wall plates, and the like. See individual sections for detailed information.

2.02 MATERIALS

A. The Contractor shall provide new materials of the type and quality detailed, listed by UL, bearing their label wherever standards have been established. Indicated brand names and catalog numbers are used to establish standards of performance and quality.

B. The Contractor shall provide material and equipment that is acceptable to AHJ as suitable for the use indicated. For example, provide plenum rated cables in ceilings that are utilized as air return plenums.

C. The Contractor is responsible for a complete and operable system and shall provide all incidental materials and accessories not specifically mentioned herein or noted on Drawings but needed for a complete and operable system, that is satisfactory to the District.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Construction Documents:

1. The Construction Drawings are diagrammatic with symbols representing Division 27/28 equipment, outlets, accessories, wiring etc.
2. The Contractor shall examine the entire set of Construction Drawings to avoid conflicts with other systems. The Contractor shall determine the exact route and installation of wiring and equipment and coordinate with other trades and/or construction conditions.

3.02 INSTALLATION

A. The Contractor shall install Division 27/28 equipment completely as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of the equipment and examine the instructions thoroughly. When requirements of the installation instructions conflict with the Contract Documents, request clarification from Project Manager/Designer prior to proceeding with the installation.

B. The Contractor shall not install equipment and/or wiring in obvious passages, doorways, scuttles, or crawl spaces, which would impede or block the passage's intended usage.

C. The Contractor shall not install equipment in locations where it would obviously be subject to damage during normal use.

3.03 FIELD QUALITY CONTROL

A. Tests: The Contractor shall conduct tests of equipment and systems to demonstrate compliance with requirements specified in Division 27/28. Refer to individual Specification Sections for required tests. Testing documentation is to be included in Closeout Documents.

3.04 CLEANING

A. The Contractor shall remove all dirt and debris caused by the execution of the work in all cabinets, surfaces and floors.

B. The Contractor shall leave the entire Division 27/28 systems installed under this Contract in a clean, dust-free, and proper working order.

C. The Contractor shall clean interiors of new and modified equipment enclosures.

END OF SECTION

SECTION 27 05 00
COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. This section specifies the basic materials and methods for all low voltage pathways installation work included under Division 27 and 28. Where those requirements differ from the requirements of this section, the more stringent shall govern.

B. This section adds refinements to Division 26 that apply to Division 27/28 communications and low-voltage systems.

1.02 SCOPE

A. Materials and/or methods for the following.
   1. Communication services
   2. Grounding
   3. Fasteners
   4. Hangers and supports
   5. Conduits/Backboxes/Raceways
   6. Underground
   7. Sleeves and penetrations

1.03 SUBMITTALS

A. Submittals shall be made in accordance with District submittal procedures, see Division 01 Submittals for requirements.

1.04 RELATED REQUIREMENTS

A. Division 07 – Thermal and Moisture Protection

B. Section 09 91 00 - Painting

C. Division 26 – Electrical

D. 27 00 00 – Communications Basic Requirements

1.05 REFERENCES

A. ANSI American Nation Standards Institute

B. NFPA 70 – National Electrical Code

C. UL Underwriters Laboratory

D. California Building Code (CBC)

E. California Electrical Code (CEC)

1.06 WARRANTY

A. Refer to Division 01 -– Warranties

PART 2 – PRODUCTS

2.01 All products used on this project shall bear the label of- and be approved by Underwriters Laboratories unless otherwise approved in writing by District. See Appendix A for pre-approved materials.

2.02 GROUNDING BUS BAR

A. Copper bus bar 2”x10”x1/4” minimum size with stand-off brackets and insulators, pre-drilled and threaded mounting holes (hole qty. 12 or greater) for equipment grounding lug attachment. Approved Manufacturer is Chatsworth Products.

2.03 FASTENERS

A. Mounting hardware and anchors recommended by the manufacturer of any material that shall be mounted to the building or structure.
   1. Sheet rock / drywall / wall board: Easy Anchor, toggle bolt, other spread type anchor with load distribution, or approved equivalent.
   2. Concrete / cinder block / solid masonry: Expanding compression type lag, expanding compression type bolt, expanding compression type, all-thread with nuts, or approved equivalent.
   3. Tile / Stucco / hollow masonry: Toggle bolts or approved equivalent.
   4. Wood: Lag screws, wood screws, or approved equivalent.
   5. Metal: Beam clamps, sheet metal screws, self-drilling screws or approved equivalent.

2.04 CABLE HANGERS AND SUPPORT

A. D-Rings
   1. Commercial grade

B. J-Hooks (For bundles of 24 cables or less)
   1. Commercial grade (See Appendix A)
   2. Colored coded by system:
      a. No color = Data
      b. Orange = Fiber optic cables and service provider feeders
      c. Blue = CCTV, Electronic Access Control, and Intrusion
      d. Yellow = Audio-Visual (non-data)
      e. Green = EMS and lighting controls
      f. Red = Fire Alarm

2.04 SURFACE RACEWAY

A. The District has standardized the use of Wiremold 800, 2300, 5400 and 5500 series for non-metallic surface raceway.

2.05 CONDUITS AND ACCESSORIES

A. CONDUITS

1. See Division 26 for additional requirements.
2. For new construction, exposed Fire Alarm pathways to be in red painted conduit.
3. All new conduits shall be sized accordingly to achieve a 40% maximum fill ratio with initial cables installed.
4. Underground conduits shall be Schedule 40 PVC.

B. INNERDUCT

1. Orange corrugated HDPE (High Density Polyethylene) Innerduct shall be used for fiber optic cable protection in interior locations.
2. Fabric multi-cell innerduct is approved for underground conduits 2” and larger.

C. FITTINGS:

1. See Division 26 for additional requirements.
2. Commercial grade.
3. Compression type.
4. Conduit bodies and any other sharp bend fittings are strictly prohibited for communication Cat6A and fiber optic cables. Appropriate conduit sweeps are required.

D. PULL LINE

1. Minimum 1/8" diameter or larger braided line of polypropylene or continuous fiber polyolefin. The minimum breaking strength of 1/8 in. line is 200 lbs.

E. SLEEVES

1. All conduit sleeves shall be of sufficient quantity and size to achieve a 40% maximum fill ratio with initial cables installed.
2. Penetrations through rated assemblies to use EZ-Path or an approved equal.

2.06 CABLE TRAYS

A. Cable trays (For cable bundles of 25 or more)

B. For above ceilings wire basket cable trays are approved and an approved manufacturer is SnakeTray.

C. For exposed areas, solid cable trays are required and an approved manufacturer is MonoSystems.

2.07 BACKBOXES AND JUNCTION BOXES

A. Galvanized one-piece or welded pressed steel type. Boxes for fixtures shall not be less than 4" square and shall be equipped with fixture stud. Boxes shall be at least 2-1/8" deep, 4" square for 1 or 2 gang devices, with device rings. Boxes mounted in wall or ceiling finished with 5/8" gypsum board shall be furnished with 5/8" deep device rings. Provide blank cover for all boxes without fixture or device. 4 11/16 and/or 5" square back boxes may be required for larger cable requirements.

B. Junction boxes, larger than 8", located indoors shall be hinged, NEMA-1 rated.

C. Junction boxes, larger than 8", located outdoors, or in wet or damp locations shall be hinged, NEMA-3R.

D. Provide and install tamper-proof screws for all exterior box lids.

E. Junction boxes used for Fire Alarm systems are to be red in color with red colored cover plates.

2.08 GROUND BOXES

A. See Division 26 and below for additional requirements.

B. Approved manufactures are Jensen, Christy or approved equivalent.

C. All ground boxes shall have metal traffic-rated lids with permanent factory markings

Division 27/28 Ground Boxes

Item	MFG1	MFG1 P/N	MFG2	MFG2 P/N	Access Control	DIV 27/28 Pathway	Comcast	AT&T	Lid Label
10" Round Ground Box Traffic Rated Bolt Down Lid	Jensen	HTV10-5	Christy	G05	A				None
10"x17" Rectangular Ground Box Traffic Rated Metal Lid	Jensen	HT1017	Christy	B1017		B			Comm

17"x30" Rectangular Ground Box Traffic Rated Metal Lid	Jensen	HT1730	Christy	B1730		C	1	1	Comm
24"x36" Rectangular Ground Box Traffic Rated Metal Lid	Jensen	HT2436	Christy	B2436		D	2		Comm
24"x36" Rectangular Ground Box Traffic Rated AT&T	Jensen	100010927						3	AT&T
Notes:									
A - At Access Controlled Gates Requiring 2 or 3 Post Connections									
B - For Special LV Pathway Max Conduits: 2 - 1" From 3 Sides (6 Total)									
C - For LV Backbone Pathway Max Conduits: 4 - 2" From 2 Sides (8 Total)									
D - For LV Backbone Pathway Max Conduits: 4 - 2" From 3 Sides (12 Total)									
1 - 17"x30" Acceptable for Service Feed (Comcast/AT&T) Midspan Pull Box									
2 - 24"x36" Acceptable for Comcast Service Entrance Splice Box									
3 - 24"x36" Acceptable for AT&T Service Entrance Splice Box									

2.09 PENETRATION SEALING

A. Firestopping: Provide UL Listed firestopping materials for all penetrations through rated assemblies (walls / floors). See Division 07 for more information. Approved manufacturers are Hilti and Specified Technologies Inc.

B. Draft stopping: Use foam sealant around conduit penetrations (in non-rated assemblies) to prevent passage of air, smoke, and/or toxic gas. See Division 07 for more information.

C. Weatherproofing: Use weatherproof sealant around conduit penetrations in exterior walls to prevent the intrusion of water. See Division 07 for more information.

PART 3 - EXECUTION

3.01 COMMUNICATION SERVICES

A. Install inground boxes, conduits, and terminal cabinets according to the service provider requirements.

3.02 GROUNDING

A. Ground fittings shall be UL approved for each application and installed and/or connected to system in accordance with current CEC Code requirements.

B. See Division 26 for additional requirements.

C. Install one grounding bus bar per manufacturer's instructions in each MDF and IDF.

3.03 CABLE HANGER AND SUPPORTS

A. Install J-hook cable hangers and supports per manufacturer's written instructions.

B. J-hook cable hanger spacing shall be 48" or less and within 12" of sleeves and/or junction/back boxes.

C. Install J-hooks pathways perpendicular/parallel to building structure – no diagonal runs.

3.04 LOW VOLTAGE PATHWAY/RACEWAYS

A. EMT conduits may be used at following locations (see Division 26 for additional requirements):
   1. In dry locations in furred spaces.
   2. In partitions other than concrete or solid masonry.
   3. In protected exterior locations not exposed to direct weather.

B. Rigid steel conduit and fittings shall be used for vertical risers and on top of all roofs, overhangs, walkways, canopies, or any other location exposed to direct weather. See Division 26 for additional requirements.

C. Furnish and install pull lines in all unused (empty) conduits or raceways. All pull lines shall be permanently tagged with identification at both ends.

D. Install exposed conduits neatly, parallel to or at right angles to structural members. Maintain a minimum of 12 inches of clearance from steam or hot water pipes. All installed strut channel supports should allow for future conduit attachments. The width of strut

channel to match the width of the closest attached junction box. See design document details for attachment requirements.

F. Supports: Support conduit with two-hole straps or strut channel where shown in design documents and/or specified. Coordinate supports with architectural details. Secure to wood structure by means of bolts or lag screws, to metal by means of shallow self-tapping screws, to concrete by means of insert or expansion bolts, to brickwork by means of expansion bolts, and to hollow masonry or stucco by means of toggle bolts.

G. Spacing for all EMT and rigid steel conduit supports shall be as follows, unless otherwise specified in design documents details:
   1. Surface conduit spacing and supports and unless otherwise specified or shown on drawing details:
      a. EMT – Size 3/4" to 2" – 4' maximum spacing (3 each supports per 10' conduit length) and 12" from each end of conduit at coupling, connector, or 90-degree bend.
      b. Rigid steel – Size 3/4" to 2" – 4' maximum spacing (3 each supports per 10' conduit length) and 12" from each end of conduit at coupling, connector, or 90-degree bend.

H. If conduit is designated for low voltage use, no more than a total of 360 degrees of conduit bend radius will be allowed between pull/junction boxes.

I. All junction boxes shall be connected to conduits using appropriate connecting hardware (i.e. box connectors).

J. Clean, prep and paint with existing matching wall color all exposed conduit, junction boxes, channel strut, fittings, and accessories.

K. Non-metallic raceway to be installed with mechanical fasteners only, do not remove adhesive tape backing.

L. Capping
   1. Cap conduits with manufactured seals during construction. Swab out conduits before installing wires.
   2. Cap all empty conduits below grade and in pull boxes with manufacturer's caps to prevent entrance of debris; attach pull string to cap.

M. Underground Conduit

   1. Service provider conduits shall be:
      a. AT&T – one ea. 4"
      b. Comcast – two ea. 2" (one spare)

2. #10 tracer wire or tracer tape is required for all underground Division 27/28 PVC conduits.

3. Before pulling any conductors into an underground PVC conduit (new or existing), the conduit shall be first be proofed by pulling through a mandrel of a diameter ¼ in. smaller than the conduit inside dia., followed by a swab of the same diameter as the conduit inside diameter. IOR to witness the proofing of underground PVC conduits.

3.05 J-BOXES

A. Screws shall be used to attach boxes, and must be accurately placed for finish, independently and securely supported by adequate wood backing or by manufactured adjustable channel type heavy-duty box hangers.
   1. Boxes shall be attached to metal studs with metal box hangers.
   2. Boxes installed in masonry tile or concrete block construction shall be secured with auxiliary plates, bars, or clips, and be grouted in place.

B. Locate outlets at the following heights unless otherwise noted on Drawings, Specifications, current CBC, or as required to meet ADA handicap requirements.
   1. Data Outlets: Same height as electrical outlets
   2. Telephone Wall Outlets: Above counter/backsplash height or at electrical switch height.

C. Boxes shall be placed within 18” of electrical outlets.

D. For sound control, separate outlets on opposite sides of walls with a 16" minimum separation. Where outlets are less than 16" or in sound rated walls, seal airtight with fire rated sheet putty pads. Fill gap between junction box and wall with acoustic sealant all around perimeter of junction box. Fill conduits larger than 1 1/4" with fire rated putty.

E. Installation of conduit and outlet boxes in fire-resistive walls, floors, floor-ceiling or roof-ceiling assemblies shall comply with Title 24, Part 2, Section 713.

3.06 GROUND BOXES

A. To be installed per Division 26 requirements.

B. Provisions are to be made for supporting cables from the box sides (i.e., j-hooks, d-rings)

C. Install a 24” x 36” ground boxes for each service providers AT&T/Comcast/other at service tie-in location.

D. Maximum underground conduit bend degrees is 360°. Additional ground boxes are required to keep conduit bends under 360°.

E. 200’ is the maximum spacing between ground boxes.

F. 17”x30” ground boxes are acceptable for mid-span pull boxes for both AT&T and Comcast.

G. 17”x30” ground boxes are acceptable for 4 – 2” conduits from a maximum of 2 sides (8 conduits total).

H. 24”x36” ground boxes are appropriate for 4 – 2” conduits from 3 sides (12 conduits total)

3.07 CONDUIT PENETRATIONS AND SLEEVES

A. PENETRATIONS:
   1. Where conduit passes through walls, ceilings, or floors, with connection points to junction boxes or raceways mounted to both sides of the same wall, provide a threaded conduit and secured in place with locking rings on both sides.
   2. Where the conduit passes through walls, ceilings, floors with connection points to junction boxes or raceways not mounted to the same wall as the penetration, provide EMT conduit and secured in place with strut channel.

B. SLEEVES
   1. Conduit sleeves are to extend 6” past wall surface and be securely attached to the building structure, with plastic bushings on both ends.

   2. For rated assemblies use EZ-Path sleeves and install per manufacturer’s instructions.

C. FIRE STOPPING

   1. Seal all conduit penetrations through fire-rated walls and floors in a manner that is fire and smoke tight in conformance with current CBC and current CEC. See Division 07 for more information.

D. DRAFT STOPPING

   1. All non-fire-rated walls must be draft-stopped and sealed. Submit method to be used for approval by inspector and/or project manager. Mineral wool is one product that may be used. See Division 07 for more information.

E. WEATHER SEALING

1. All exterior penetrations shall be sealed watertight. The contractor shall use silicone rubber caulk or other approved methods and materials. Submit methods and materials to inspector and/or project manager. See Division 07 for more information.

3.08 CLEANING

A. Clean all work prior to concealing, painting, and acceptance. Performed in stages if directed.

B. Clean and repair soiled or damaged painted exposed work before final acceptance in a manner to match adjoining work.

C. Remove debris from inside and outside of equipment and enclosures.

3.09 PAINTING

A. Paint exposed conduit and j-boxes occurring in finished areas with existing matching wall color. See 09 91 00 – Painting

3.10 FINAL DOCUMENT SUBMITTALS

A. See 27 00 00 for more information.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MANUFACTURER	PART NUMBER
10" Round Ground Box Traffic Rated Bolt Down Lid	Jensen Christy	HTV10-5 G05
10"x17" Rectangular Ground Box Traffic Rated Metal Lid	Jensen Christy	HT1017 B1017
17"x30" Rectangular Ground Box Traffic Rated Metal Lid	Jensen Christy	HT1730 B1730
24"x36" Rectangular Ground Box Traffic Rated Metal Lid	Jensen Christy	HT2436 B2436
24"x36" Rectangular Ground Box Traffic Rated AT&T	Jensen	100010927
Cable tray, wire basket, ceiling mounted	Snake Tray	201 series ceiling mounted
Cable tray, wire basket, wall mounted	Snake Tray	501 series wall mounted
Cable tray, solid bottom, center hung style	MonoSystems	RTCX-XX-120-PX
Cable tray, solid bottom, wall mount style	MonoSystems	RTWX-XX-120-PX
Non-metallic Surface Raceway	Legrand/Wiremold	2300 Series
Non-metallic Surface Raceway	Legrand/Wiremold	5400/5500 Series
Floor Box (Data/Power)	FSR	FL-500P
Fire Rated Sleeve	Specified Technologies Inc.	EZ Path
Fire Rated Sealant	Specified Technologies Inc. Hilti	SpecSeal products CFS products
Conduit, Fittings, J-Boxes	Commercial grade from local electrical supply companies.	Commercial grade from local electrical supply companies.
J-Hooks	Nvent Cooper	Caddy Series B-Line Series
Grounding Bus Bar	Chatsworth Products	10622-012

END OF APPENDIX A
END OF SECTION

SECTION 27 10 00
STRUCTURED CABLING

PART 1 – GENERAL

1.01 SUMMARY

A. This section specifies equipment, accessories, materials, installation, configuration, and testing requirements for a complete and operable Structured Cabling communications system. The system shall provide highly reliable and high-performance data communication from main distribution frame (MDF) through each intermediate distribution frame (IDF) to end points requiring fiber optics and/or copper cabling and associated equipment.

B. This section condenses sections 27 11 00 – Communications Equipment Room Fittings, 27 13 00 – Communications Backbone Cabling, 27 15 00 – Communications Horizontal Cabling and 27 16 00 – Communications Connecting Cords into one comprehensive section.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:

1. Contractor shall furnish and install all required components and accessories as outlined in the design documents for a complete and operable turn-key system.
2. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship. Contractors unfamiliar with the District's standards shall familiarize themselves with the standards and requirements prior to beginning work
3. The Contractor shall furnish and install fire-treated ¾" (three quarter inch) plywood for the MDF room (all walls, from floor level to 8' high) and IDF locations (as required or indicated in the design documents).
4. The Contractor shall furnish and install a ground bus bar at the MDF and IDF rooms.
5. The Contractor shall furnish and install all required racks and cabinets.
6. The Contractor shall furnish and install all newly required conduit/raceway.
7. The Contractor shall furnish and install all wire/cable (copper/fiber optic) as required.
8. The Contractor shall terminate all strands of fiber at each fiber enclosure.
9. The Contractor shall furnish and install termination at all end-point equipment (patch panels, jacks, wallplates, enclosures, etc.).
10. The Contractor shall furnish and install all patch cords (copper/fiber).
11. The Contractor shall test and certify (for warranty) the installed cable plant.

1.03 RELATED REQUIREMENTS

A. Section 01 – General Requirements

B. Section 27 00 00 – Communications

C. Section 27 05 00 – Common Work Results for Communication Systems.

1.04 INDUSTRY GUIDELINES AND STANDARDS

A. California Electrical Code (CEC) – Current adopted version

B. California Building Code (CBC) – Current adopted version.

C. ANSI/TIA-568.0-D – Generic Communications Cabling for Customer Premises.

D. ANSI/TIA-568.1-D – Commercial Building Communications Cabling Standard Part 1: General Requirements.

E. ANSI/TIA 568-C.2 – Balanced Twisted-Pair Telecommunications Cabling and Components Standards

F. ANSI/TIA 568.3-D – Optical Fiber Cabling Components Standard

G. ANSI/TIA-569-D – Commercial Building Standard for Telecommunications Pathways and Spaces.

J. ANSI/TIA-606-B – Administration Standard for the Commercial Telecommunications Infrastructure.

K. ANSI/JSTD-607-C – Commercial Building Bonding and Grounding (Earthing) Requirements for Telecommunications.

1.05 QUALIFICATIONS

A. The contractor shall possess a California C7 or C10 license.

B. The Contractor or Subcontractor shall have 5 years' documented experience.

C. The Contractor and installers shall be certified by the product manufacturer.

1.06 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing data cable plan system.

1.07 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

A. See section 27 00 00 for requirements.

1.08 SUBMITTALS

A. See section 27 00 00 for requirements.

1.09 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

C. 25-year manufacturer's warranty/certification required for all copper and fiber cable plant installations.

1.10 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. See Appendix A at the end of this document for pre-approved materials.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. The Contractor shall confirm all equipment part numbers with the Project Manager or District prior to ordering equipment and updating submittals as required.

D. The Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. The Contractor shall provide all components needed for complete and satisfactory installation and operation.

E. The Contractor shall install mounting hardware and anchors as recommended by the Manufacturer of the equipment that requires mounting to the building or structure and adhere to all code requirements. See section 27 05 00 for requirements.

F. Product Availability

1. The Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2.02 MANUFACTURERS AND PRODUCTS

A. See Appendix A at the end of this document for pre-approved materials.

B. Product Substitutions require proof of equivalence and approval by District and/or its representative. Substitution requests to be submitted in writing.

C. For maintenance and consistency with the existing installed base, data connectivity components (copper and fiber) shall be Superior Essex cable and Ortronics connectivity.

2.03 COPPER/FIBER OPTIC CABLES AND COMPONENTS

A. All copper cables and components shall be Cat6A rated.
1. Cable to be reduced diameter. White jacket for default cable, Blue jacket for CCTV and Access Control only.
2. Jacks to be keystone style.
3. All cables shall be terminated on keystones at IDF/MDF end. No modular plug terminations are permitted at IDF/MDF locations.

B. Patch cords system/color:
   1. Data = White color
   2. AP = Green color (2 ea. req'd at each AP)
   3. CCTV = Blue color
   4. Clock/Intercom = Yellow color
   5. Access Control = Black color
   6. Fire Alarm/Intrusion Alarm = Red color

C. Patch cord length
   1. At patch panel 6" typical or no more than 12" slack.
   2. Station-side patch cords to be 10' in length.

D. Data jacks system/color:
   1. Data/default = White color
   2. AP = Green color
   3. CCTV = Blue color
   4. Clock/Intercom = Yellow color
   5. Access Control = Black color
   6. Fire Alarm/Intrusion Alarm = Red color

E. Fiber Optic Cable:
   1. Minimum strand count is 24.
   2. All fiber optic cables and components shall be single single-mode OS2 rated.
   3. Fiber optic cable terminations shall be LC-Duplex style.

PART 3 – EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The components making up the structure cabling system shall only be installed by Contractors who are qualified to install, service and maintain the system.

B. Cable terminations (copper or fiber) shall be installed by manufacturer-certified technicians.

C. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to job bidding. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for accurate bidding and performance of the Work.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall order all required parts and equipment upon receipt of approved product submittals.

B. The Contractor shall verify the availability of power where required.

3.04 SHOP DRAWINGS

A. The Contractor shall create "Shop Drawings" per section 27 00 00 for this section.

B. Submit drawings for review and approval by the Project Manager and/or Designer.

3.05 INSTALLATION

A. ENTRANCE FACILITIES

1. Contact telecommunications service provider and arrange for installation of demarcation point, protected entrance terminals, and housing when so directed by service provider.

2. Install underground or aerial pathways complying with recommendations in TIA/EIA-569-A, "Entrance Facilities" Article.

B. UNDERGROUND ENTRANCE PATHWAY

1. Install the underground entrance pathway complying with Division 26.

C. EQUIPMENT RACKS, CABINETS, ENCLOSURES AND ACCESSORIES

1. Backboards:
   a. Shall be installed behind the rack or cabinet if the cabinet is not able to be directly attached to two vertical wall studs.
   b. Backboards shall be made of fire retardant or treated materials, squarely cut, and with sanded edges
   c. Backboards shall be a minimum ¾" thick and large enough to secure it to two vertical wall studs.
   d. The "FIRE RATED" stamp shall be visible.
   e. Backboards shall be fastened with ¼" lag bolt and washer, non-recessed, with maximum spacing of 18" into 2 vertical studs, 1-1/2" embedment, or otherwise per DSA-approved anchorage details.
   f. Visible portions (outside of cabinet) of Backboards shall be painted black or wall color per Architect.

2. All data & voice communications racks and cabinets shall be anchored in accordance with manufacturer's specifications, project specifications and/or drawn details, to walls and floors and grounded to building ground grid (not to water pipes etc.).

3. Securely mount equipment cabinet and racks to the building structure. A proper quantity of support fasteners shall be utilized. Typically lag bolts for wood installations, wedge anchors for concrete flooring. Submit data sheets for mounting fasteners for approval before installation. Mount equipment per DSA approved drawings/details.

4. Equipment cabinet mounted on or against walls will have 3-foot clearance in front of deepest component and accessible to rear for service.

5. MDF and all IDFs shall have at least one dedicated 120VAC 20-amp quad-receptacle each.

6. Patch Panels: Mount patch panels into the cabinet/rack. Match manufacturer of existing install or if new construction, see Appendix A.

   a. Patch panel ports shall be grouped by Room and then by System (General Data, Intercom, AP, Other). Label the patch panel with the first port of each Room.
   b. Exterior devices shall be grouped with the closest adjacent interior space.
   c. Do not segregate patch panels by system unless specifically directed on the rack elevation.

7. Cable Management: Secure the cable bundle(s) to the rack strain relief and cable management behind the patch panels and cross connect block panels. Install horizontal cable management panels and brackets for routing and management of patch cables. Maintain TIA/EIA and BICSI standards on bundling, supporting and bend radius.

8. Surge Protected Outlet Strips: Required in MDF rack. Mount surge protected outlet strips per Manufacturer's directions. Refer to details on the Drawings for mounting location.

D. MDF/IDF GROUNDING

1. Refer to Section 27 05 00 Grounding for more requirements.

2. Locate the grounding bus bar to minimize the length of bonding conductors. Fasten to the wall allowing at least 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 6 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

3. Bond metallic equipment (including ladder rack) to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.06 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District' Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. Comply with the highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. Perform Work with persons experienced and qualified to produce workmanship specified.

E. Maintain quality control over suppliers and Subcontractors.

3.07 WIRE/CABLE (COPPER/FIBER OPTIC)

A. Design, layout, size, and plan new cable runs as required.

B. All wire and cable passing through metalwork shall be sleeved by an approved grommet or bushing.

C. Conduit/raceway fill shall not exceed 40 percent of interior cross-sectional area.

D. Neatly dress and tie (Velcro) all cabling.

E. UTP cabling shall conform to a 6-foot separation requirement from the main power panel, transformers, switchgear and/or starter motors adjacent to the MDF, IDF and termination locations.

F. Fiber optic cables shall be installed from the MDF to each IDF.

G. Orange corrugated HDPE (High Density Polythylene) Innerduct shall be used for fiber optic cable protection in all interior locations.

H. Spicing of fiber optic cable shall be done with fusion splices.

I. When required copper feeders (minimum 4-pair) are to be installed from the MDF to each IDF.

J. Maintain proper bend radius for all cable installations.

K. Do not exceed cable manufacturer's instructions for installation pull load. Any cable damaged by excessive pull force shall be replaced by the installation contractor.

L. Modular plug terminated link (MPTL) style wiring is acceptable for CCTV with modified single connector permanent link testing.

3.08 LABELING

A. MDF/IDF - Identification number in large font on front of cabinet.
   b. The MDF shall be labeled MDF 1.00
   c. IDF's shall be labeled sequentially beginning at IDF 1.01, then IDF 1.02, and so on.

B. MDF, Fiber Optic LIU Ports – IDF number and room number

C. MDF/IDF, Copper Patch Panel – Panels labeled P1, P2, P3, etc., ports labeled with room number.

D. LAN Outlet – IDF number, patch panel number, patch panel port number.

E. Cables to be labeled both ends with unique identifiers and from/to location identifiers. For Copper Cat cable IDF number, patch panel number, patch panel port number.

F. T-bar ceilings shall have device labels attached next to the device for ceiling mounted equipment and at the tile for above ceiling equipment with device type and device ID points/IP address.

3.09 CONDUIT AND RACEWAY INSTALLATION

A. See Division 26 and section 27 05 00 for additional requirements.

B. Conduit bodies and any other sharp bend fittings are strictly prohibited for communications cabling (copper/fiber).

C. Install proper radius conduit sweeps where required.

3.10 COMISSIONING PREPARATION

A. 4 weeks prior to system turn up:
   a. All jacks in patch panels are to be completely installed.
   b. A worksheet is to be prepared by the Contractor indicating which switch port is assigned to what system (i.e. general data, intercom, AP, etc.) and the worksheet to be attached to the data switch.
   c. Data switches are to be delivered to the District by the Contractor and coordinated with the District's Network Engineer.

3.11 FIELD QUALITY CONTROL AND TESTING

A. All Fiber and Cat6a copper cable installations to be certified by testing with an certified test system that is approved by the manufacturer for warranty certification (typically a Fluke).

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system, the Contractor shall have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. Notify the District when ready to perform a re-inspection of the installation.

F. Provide 25-year manufacturer's warranty/certification documentation for all copper and fiber cable plant installations.

3.12 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Rack Cabinet 7’ (43U), 41” Deep	Chatsworth Products	Z4-21N-113C-C12
Wall Mount Cabinet 24” (12 RU) 30” Deep *(retrofit only, not for new construction)*	Chatsworth Products	12419-724
CUBE-iT Fan Kit	Chatsworth Products	40972-001
20 AMP Power Strip	Chatsworth Products	12848-701
Standard Busbar	Chatsworth Products	10622-010
12" Ladder Rack 10'	Chatsworth Products	11275-712
Ladder Rack Triangular Support Bracket	Chatsworth Products	11746-712
Ladder Rack Wall Angle Support 12"	Chatsworth Products	11421-712
Ladder Rack Butt-Splice Kit	Chatsworth Products	11301-712
Ladder Rack Foot Kit	Chatsworth Products	11309-701
19” Horizontal Cable Manager	Ortronics	808004759
Patch Panel 24-port 1-RU (Black)	Ortronics	OR-SPKSU24
Patch Panel 48-port 2-RU (Black)	Ortronics	OR-SPKSU48
Patch Panel Cable Management Support Bar	Ortronics	OR-CMBFR0RU
Faceplate, 2-port (White)	Ortronics	KSFP2-88
Faceplate, 4-port (White)	Ortronics	KSFP4-88
Surface Mount, 2-port (White)	Ortronics	KSSMB2
Faceplate, 1-port Phone Hanger (Stainless)	Ortronics	403STJ1WP
Cat6A Data Jacks (White)	Ortronics	KT2J6A-88
Cat6A Data Jacks (Green)	Ortronics	KT2J6A-45
Cat6A Data Jacks (Blue)	Ortronics	KT2J6A-36

Cat6A Data Jacks (Yellow)	**Ortronics**	**KT2J6A-44**
Cat6A Data Jacks (Black)	**Ortronics**	**KT2J6A-00**
Cat6A Data Cable, Plenum (White = default)	**Superior Essex**	**6B-246-4B**
Cat6A Data Cable, Plenum (Blue = CCTV/Access Control)	**Superior Essex**	**6B-246-2B**
Cat6A Data Cable, Indoor/Outdoor (Black)	**Superior Essex**	**6B-272-ER**
Cat6A Data Cable, OSP (Black)	**Superior Essex**	**04-001-A8**
Extended Distance PPoE Cable, OSP	**Superior Essex**	**PW04-401-48**
Cat6A Patch Cord – for Extended Distance links only (Black)	**Monoprice**	**44669**
Cat6A Patch Cord Slim (White) (12” typ.)	**Quiktron**	**576A-RD25-0xx (xx = length)**
Cat6A Patch Cord Slim (Blue) (12” typ.)	**Quiktron**	**576A-RD10-0xx (xx = length)**
Cat6A Patch Cord Slim (Green) (12” typ.)	**Quiktron**	**576A-RD20-0xx (xx = length)**
Cat6A Patch Cord Slim (Yellow) (12” typ.)	**Quiktron**	**576A-RD15-0xx (xx = length)**
Cat6A Patch Cord Slim (Black) (12” typ.)	**Quiktron**	**576A-RD35-0xx (xx = length)**
Fiber Optic LIU 1-RU	**Ortronics, Q-Series**	**EQ01U-CHC**
Fiber Optic LIU 2-RU	**Ortronics, Q-Series**	**EQ02U-CHC**
Fiber Optic LIU 4-RU	**Ortronics, Q-Series**	**EQ04U-CVC**
Splice Tray	**Ortronics, Q-Series**	**FST4-F012 w/ mounting bracket WQS-STB**
Fiber Optic Adapter	**Ortronics, Q-Series**	**OFP-LCQ24AC**
Fiber Optic LC Field Term Connector	**Ortronics**	**205KNF9SA-09**
Fiber Optic Cable 24-strand, Single-Mode OS2, Indoor/Outdoor	**Superior Essex**	**W4024K101**

END OF SECTION

SECTION 27 21 00

DATA COMMUNICATIONS NETWORK EQUIPMENT

PART I - GENERAL

1.01 SUMMARY

A. This section specifies equipment, accessories, materials, installation, configuration, and testing requirements for a complete and operable data network system. The system shall provide reliable and high-performance data communication throughout the site.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:

1. Provide, coordinate, and install all required equipment, licenses, and accessories as outlined in the design documents for a complete and operable system.
2. Labor and Materials: The Contractor shall provide and pay for all labor, supervision, materials, accessories, components, equipment, tools, utilities, construction equipment and machinery, transportation, and other facilities and services necessary for the proper execution, operation, and completion of a turn-key system to the District.
3. Data Communications Network Equipment**:** Includes, but is not limited to:
    a. Routers
    b. Firewalls
    c. Networking Switches
    d. Wireless Access Points
    e. Licenses
    f. Uninterruptible Power Supplies (UPS)
4. Data Switches are to be programmed/configured by the contractor to the District's specifications. Contractors are responsible for retaining a Cisco-certified network engineer to complete this scope if they do not possess this capability in-house.

1.03 RELATED REQUIREMENTS

A. Division 01 - General Requirements

B. Section 27 00 00 - Communications

C. Section 27 05 00 - Common Work Results for Communication Systems.

D. Section 27 10 00 - Structured Cabling

1.04 QUALIFICATIONS

A. Contractor shall be located within 50 miles or less from the project site to support 2-hour response time.

B. Five years' experience installing data network equipment and systems.

1.05 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing data network infrastructure.

1.06 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

A. See section 27 00 00 for requirements.

1.07 SUBMITTALS

A. See section 27 00 00 for requirements.

1.08 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

1.09 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 - PRODUCTS

2.01 GENERAL

A. See Appendix A at the end of this document for pre-approved materials.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. Contractor shall provide all components needed for complete and satisfactory installation/operation.

D. Product Availability

1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2. Subject to compliance with these specifications, products and systems included in this section are to be installed as specified by the manufacturer of the system or engineer approved equal.

2.02 EQUIPMENT

A. The District's preferred manufacturer for:
   1. Routers - Cisco
   2. Firewalls - Cisco
   3. Networking Switches – Cisco
   4. Wireless Access Points - Cisco
   5. UPS – N1C

B. Substitutions require proof of equivalence and approval by District and/or its representative.

C. All equipment shall be provided with Licenses as required for seamless integration with the District's network infrastructure.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The equipment shall only be installed by Contractors who are qualified to install and maintain the system.

B. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience installing data network equipment before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to bidding for the job. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for observing and considering those conditions which a Contractor would have observed and considered during a site visit, estimating properly the difficulty and cost of successfully performing the Work or proceeding to perform the Work without additional cost to District.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall verify materials are readily available prior to submitting product submittals and notify the Project Manager of long lead time items.

B. The Contractor shall order all required parts and equipment only after receipt of approved product submittals from the Project Manager.

C. The Contractor shall coordinate with the District's Technology Services department for needed IP addresses at least 4 weeks prior to configuration/installation.

3.04 SHOP DRAWINGS

A. The Contractor shall create "Shop Drawings" per section 27 00 00.

3.05 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District's Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. Comply with the highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. Perform Work with persons experienced and qualified to produce workmanship specified.

E. Maintain quality control over suppliers and Subcontractors.

3.06 PATHWAY AND EQUIPMENT INSTALLATION

A. Install all conduit and pathway per design documents. Refer to 27 05 00 for additional information/requirements.

B. Install all Cat6A cable per design documents. Refer to 27 15 00 for additional information/requirements.

C. Equipment to be installed per manufacturer's instructions.

D. Devices requiring PoE power shall be connected to a PoE switch in the MDF/IDF data rack – verify with Technology Services for available PoE power.

3.07 EQUIPMENT COMISSIONING/CONFIGURATION

A. See 27 10 00, 3.10 COMISSIONING PREPARATION

B. The Contractor shall install the equipment and patch in all connections.

C. All equipment to be fully configured and tested for functionality by the Contractor prior to District acceptance testing.

3.08 LABELING

A. The contractor shall be responsible for labeling all newly-provided active equipment per District standard.

B. Network Switches

a. ½" Label tape on front of switch, above SFP ports, with Host Name, IP address, and stack position (if applicable)

b. Host Names shall follow the format
<Site Code>-<IDF#>-<Location>-<Model>-<Ports>-<Stack>
For example, Oak Ridge, IDF 1, Room A120, Cisco 9300, 48 port, two switch stack: ORIDGE-IDF1-A120-9300-48P-1-2

D. Wireless AP's
    a. ½" label tape on center of AP, with Host Name
    b. Interior AP Host Names shall follow the format
    <Site Code>_AP_RM<location>_<last 4 of MAC address>
    ORIDGE_AP_RMA101_XXXX
    c. Exterior AP Host Names shall follow the format
    <Site Code>_AP_EXTRM<location>_<last 4 of MAC address>

D. ORIDGE_AP_EXTRMA101_XXXX

3.09 FIELD QUALITY CONTROL AND TESTING

A. Upon reaching substantial completion, perform a complete test and inspection of the system. If found to be installed and operating properly, notify the District of readiness to perform the formal Test & Inspection of the complete system by the District or its representative. Make all adjustments/changes required from District/representative review.

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system and have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. Notify the District when ready to perform a re-inspection of the installation.

3.10 AS-BUILT DRAWINGS

A. See section 27 00 00 for requirements.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Network Switch (Existing Site Retrofit)	Cisco	C9300L-48UXG-4X-EDU
Network Switch License (DNA Essentials, 48-port, 3-yr)	Cisco	C9300-DNA-E-48-3Y
Network Switch Secondary Power Supply	Cisco	PWR-C1-1100WAC-P
SFP transceiver	Cisco	SFP-10G-LR
DAC Cable (9300 to previous gen switch)	Cisco	SFP-H10GB-CU1M
Stack Kit (9300 to 9300)	Cisco	C9300L-STACK-KIT
Core Switch (16SFP+/2QSFP+)	Cisco	C9500-24Y4C-EDU
Core Switch (larger sites)	Cisco	C9500-48Y4C-EDU
Core Switch License (DNA Essentials, 3-yr)	Cisco	C9500-DNA-E-3Y
Core Switch Power Supply	Cisco	PWR-C4-950WAC-R
Wireless Access Point (Interior) (note: includes low-profile bracket and ceiling grid clip)	Cisco	C9130AXI-B
Ceiling Mount Bracket (Low-profile) for C9130AX	Cisco	AIR-AP-BRACKET-1
Ceiling Mount Bracket (Universal/ Electrical Box) for C9130AX	Cisco	AIR-AP-BRACKET-2
T-bar Mount Bracket (Recessed Tiles) for C9130AX	Cisco	AIR-AP-T-RAIL-R
T-bar Mount Bracket (Flat Tiles) for C9130AX	Cisco	AIR-AP-T-RAIL-F
Wireless Access Point (Exterior/Surface)	Cisco	C9124-AXE-B with 4 Ea. AIR-ANT2568VG
Wireless Access Point (Exterior/ with Oberon)	Cisco	C9124-AXI-B
Wall/Pole Mount for C9124-AXI-B	Cisco	MNT-VERT1
Exterior AP Enclosure	Oberon	1021-00
UPS (MDF 4-post) with network monitoring and external battery	N1C	N1C.LR2000, N1C.L4850EBM2U (For 2 post rack mount only - add

(2000VA, 50AH) 120VAC input		N1C.24RAILKIT)
UPS (MDF 4-post) with network monitoring and external battery (2000VA, 50AH) 208-240VAC input	N1C	N1C.LR2000G, N1C.L4850EBM2U (For 2 post rack mount only - add N1C.24RAILKIT)
UPS (IDF) with network monitoring (1000 VA) 120VAC input	N1C	N1C.L1000
UPS (IDF) with network monitoring (1500 VA) 120VAC input	N1C	N1C.L1500
UPS (IDF) with network monitoring (2000 VA) 120VAC input	N1C	N1C.L2000
Long range point-to-point Ethernet & PoE Extender (Base)	Veracity	VLS-1P-B
Long range point-to-point Ethernet & PoE Extender (Camera)	Veracity	VLS-1P-C

END OF APPENDIX A

END OF SECTION

SECTION 27 51 23.50

EDUCATIONAL INTERCOM SYSTEMS

PART I - GENERAL

1.01 SUMMARY

A. This section specifies equipment, accessories, materials, wire, installation, configuration, and testing requirements for a complete and operable Intercom/Public Address/Bell system. This system shall provide the ability to bi-directionally communicate with an individual room, broadcast to defined speaker zone(s) and ring bell tones on a predefined schedule. For sites that utilize the small message board, this section will supplant the use of section 27 53 13 Clock Systems.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:

1. Labor and Materials: The Contractor shall provide and pay for all labor, supervision, materials, accessories, components, equipment, tools, transportation, and other facilities and services necessary for the proper installation of a turn-key Assistive Listening system to the District.

2. The contractor will coordinate with the District in writing for any needed information (i.e. IP addresses, etc.) 10 business days prior to the date the information is needed.

B. The District has standardized on Rauland Telecenter U equipment and the installing Contractor shall be Rauland Telecenter authorized.

C. For existing construction – provide and install all components and accessories to modify the existing system while maintaining code compliance and to seamlessly integrate the new components into the existing campus' system. Prior to beginning any work, the Contractor is responsible for identifying any existing system errors or faults and bring these issues to the attention of the District Project Manager.

D. The Contractor shall be responsible for programming the Rauland Telecenter Intercom System.

E. The Contractor shall coordinate with site staff for Bell schedule programming requirements.

F. The Contractor shall review the proposed final system programming, functionality and expectations with the project manager, Architect/Engineer/Designer and District prior to final programming.

G. After completion of the installation and pretest of the system a satisfactory final test of the entire system shall be made in the presence of the inspector of record (IOR) and District or the District's representative.

H. The Contractor shall adjust any speaker levels to the appropriate level as determined in system testing.

I. Existing systems shall remain operable until the new system is accepted and approved by the District or the District's representative.

J. The Contractor is responsible for user/operator training (maximum 2 hours).

K. The Contractor shall complete all required project closeout documentation in a timely fashion.

1.03 RELATED REQUIREMENTS

A. Division 01 – General Requirements

B. Section 27 00 00 - Communications

C. Section 27 05 00 – Common Work Results for Communication Systems.

E. Section 27 10 00 – Structured Cabling

1.04 REFERENCES

A. See section 27 00 00 for requirements.

1.05 DEFINITIONS

A. See section 27 00 00 for requirements.

1.06 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing intercom system when applicable.

1.07 SUBMITTALS

A. See section 27 00 00 for requirements.

1.08 CONTRACTOR “SHOP DRAWINGS” DESIGN REQUIREMENTS

A. See section 27 00 00 for requirements.

B. Shop drawings are required for this section.

1.09 QUALIFICATIONS

B. The Contractor shall be located within 50 miles or less from the project site to support 2-hour response time.

B. Five (5) years’ experience installing Rauland Telecenter equipment.

C. The contractor shall possess a California a C7 or C10 license.

D. The Contractor or Subcontractor shall be Rauland Telecenter authorized to provide and install equipment with 5 years documented experience.

1.10 CERTIFICATIONS

A. Installers shall be manufacturer certified.

1.11 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District’s Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. The Contractor shall comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. The Contractor shall perform the “Work” with persons experienced and qualified to produce the high-level workmanship specified.

E. The Contractor shall maintain quality control over suppliers and Subcontractors.

F. The Contractor shall be responsible for scheduling Subcontractors in a timely fashion.

1.12 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

1.13 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. The approved manufacturers for the project are:
   1. Control unit and related accessories: Rauland Telecenter U
   2. Speakers: See Appendix A for different installation types
   3. Wire, cable, and accessories: See Appendix A.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. The Contractor shall provide all components needed for complete and satisfactory installation and operation.

D. Product Availability

   1. The Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

   2. Subject to compliance with these specifications, products and systems included in this section are to be installed as specified by the manufacturer of the system or engineer approved equal.

2.02 EQUIPMENT

A. See Appendix A at the end of this document for pre-approved materials.

B. Substitutions require proof of equivalence and prior approval by District and/or its representative before ordering.

C. Main system components:
   1. Rauland Telecenter U IP Campus Controller and software
   2. Rauland Telecenter U Auxilliary Input/Output Module
   4. Rauland Telecenter U IP Classroom Module
   5. Rauland Telecenter U Administrative Console
   6. Rauland Telecenter U Program Line Input Module

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The equipment shall only be installed by Contractors who are qualified and certified by the manufacturer to install and maintain the system.

B. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience installing educational intercom equipment before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to bidding the job. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for observing and considering those conditions which a Contractor would have observed and considered during a site visit, estimating properly the difficulty and cost of successfully performing the Work or proceeding to perform the Work without additional cost to District.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall verify materials are readily available prior to submitting product submittals and notify the District's Project Manager of long lead time items.

B. The Contractor shall order all required parts and equipment only after receipt of approved product submittals from the District's Project Manager.

C. The Contractor shall submit and receive approval for shop drawings prior to work commencement.

3.04 PATHWAY INSTALLATION

A. See Division 26 and Section 27 05 00 for requirements and more information.

B. Existing Construction:
   1. Refer to design documents.
   2. Surface raceway and components shall be Wiremold 2300.

3.05 EQUIPMENT INSTALLATION

A. Equipment to be wired and installed per manufacturer's instructions.

B. The Contractor shall coordinate with the District's IT Department or District's representative if connecting to the District's network. The Contractor shall provide a spreadsheet of all device MAC addresses indexed by device location to the District IT department to facilitate programming of reserved IP addresses for each device.

C. Installation shall be in accordance with applicable codes (i.e. NEC, NFPA 72) local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.

D. Perform all Work as indicated in the Drawings and Specifications.

E. All low voltage cables shall be kept away from power circuits.

F. Contractor shall provide programming and configuration of the Educational Intercom system for full functionality.

G. Contractor shall maintain a complete, up-to-date backup of the system configuration. Backup shall be maintained throughout the programming period until final Acceptance by District. Submit back-ups to District upon Final Acceptance.

3.06 LABELING/SCHEDULES

A. All labels are to be machine generated black letters on white adhesive label stock that is appropriate for the installation environment (interior/exterior).

B. Label all standard speaker cables with port ID.

C. Label all speakers with speaker ID.

D. Label all IP speakers with MDF/IDF, patch panel and jack numbers.

3.09 CONFIGURATION

A. All equipment to be fully configured and tested for functionality prior to testing.

3.10 FIELD QUALITY CONTROL AND TESTING

A. Upon reaching substantial completion, perform a complete test and inspection of the system. If found to be installed and operating properly, notify District of your readiness to perform the formal Test & Inspection of the complete system.

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system the Contractor shall have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. Notify the District when ready to perform a re-inspection of the installation.

F. District or its representative to provide final sign-off for acceptance.

3.11 AS-BUILT DRAWINGS

A. See section 27 00 00 for requirements.

B. As-built riser diagram showing all access control components for site.

3.12 TRAINING

A. For new systems provide 8-hrs end-user training.

B. For existing system upgrades provide 2-hrs end-user training.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
IP Campus Controller and software/licenses	**Rauland Telecenter U**	**TCC2000**
Administrative Console	**Rauland Telecenter U**	**TCC2045**
Auxiliary Input/Output Module	**Rauland Telecenter U**	**TCC2033**
Universal Rack Mounting Kit	**Rauland Telecenter U**	**TCC2099**
Program Line Input Module	**Rauland Telecenter U**	**TCC2055**
IP Classroom Module	**Rauland Telecenter U**	**TCC2011B**
8-Ohm 8" Speaker assembly surface (retrofit)	**Rauland**	- **Speaker USO880** - **Backbox ACC1112** - **Baffle ACC1003** - **Add: IP Classroom module**
Clock/Speaker surface combo (standard classroom/office retrofit)	**Rauland**	- **Baffle w/ Speaker ACC3011S** - **Backbox ACC3011SBB** - **Message Board TCC3011S** **Add: IP Classroom module**
Exterior Speaker (retrofit)	**Rauland** **Lowell** **Rauland** **FSR**	**Backbox: ACC1113** **Baffle: ACC1012** **Speaker: 8C10MRB** **Interior Backbox SMWB-4G-WHT** - **Add: IP Classroom Module (single speaker up to 2W)** **Add: Wire breakout 603101 (when IP module used)**
Large Message Board (Clock)	**Rauland**	**TCC3012L**
Wire Guard for Large Message Board	**American Time**	**G2055OF-28**
UPS (Telecenter Head End	**N1C**	**N1C.L1500**

END OF APPENDIX
END OF SECTION

SECTION 28 10 00

ACCESS CONTROL SYSTEM

PART I - GENERAL

1.01 SUMMARY

A. This section specifies equipment, accessories, materials, installation, configuration, and testing requirements for a complete and operable electronic access control system. The system shall provide electronic access to secure doorways for authorized people at an authorized time of day.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:
   1. Labor and Materials: The Contractor shall provide and pay for all labor, supervision, materials, licenses, accessories, components, equipment, tools, transportation, and other facilities and services necessary for the proper installation of a turn-key Access Control system to the District.
   2. The contractor will coordinate with the District in writing for any needed information (i.e. IP addresses, etc.) at least 2 weeks prior to the date the information is needed.
   3. Access Control software and equipment: Includes, but is not limited to:
      a. Software based system for user authentication and system control
      b. RFID cards/fobs
      c. RFID readers
      d. Door controllers
      e. Power supplies
      f. Electrified door hardware/latches/strikes
      g. Door position switches
      h. Power transfer hinges/armored loops
      i. Request to exit (REX) devices (typically integrated into the door hardware)
      j. ACM/Unity licenses
   4. Typical installation includes software, door controller, card reader, door sensor, request to exit (REX) and electrified door hardware.
   5. Typical installations require bored doors and power transfer (see 08 71 00 – Door Hardware for more information).
   6. All installations with network connectivity shall utilize District's network and be managed by the District's Avigilon ACM/Unity Enterprise system.
   7. Access control hardware shall continue to fully function in the event of communication loss to the central server.
   8. Power to control panels shall be hardwired in conduit with wire-nut makeup in attached j-box with cover.
   9. All door controllers shall have battery backup.

1.03 RELATED REQUIREMENTS

A. Division 01 – General Requirements

B. Section 08 71 00 – Door Hardware

C. Section 27 00 00 - Communications

D. Section 27 05 00 – Common Work Results for Communication Systems.

E. Section 27 10 00 – Structured Cabling

F. Americans with Disability Act (ADA)

1.04 REFERENCES

A. See section 27 00 00 for requirements.

1.05 DEFINITIONS

A. See section 27 00 00 for definitions.

1.06 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing Access Control systems and integrate into the Districts Avigilon ACM/Unity Enterprise installation.

1.07 SUBMITTALS

A. See section 27 00 00 for requirements.

1.08 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

A. See section 27 00 00 for requirements.

B. Shop drawings are required for this section.

1.09 QUALIFICATIONS

A. The installation Contractor/Subcontractor shall be located within 50 miles or less from the project site to support 2-hour response time.

B. The installation Contractor/Subcontractor shall have a minimum of five years' direct experience with the product they are installing. Installation technicians shall be certified and with a minimum of three years' direct experience with the product they are installing.

C. The installation Contractor/Subcontractor shall have performed successful installation of at least three projects similar in scope and size. The Contractor must be able to provide project references for these three projects, including scope of work, project type, owner/user contact name and telephone number.

D. The Contractor selected for this project shall provide current certificates for all technicians working on the project.

1.10 CERTIFICATIONS

A. The Contractor selected for this project shall provide current certificates for all technicians working on the project. See section 27 00 00 for additional requirements.

1.11 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District, District's representative or Project Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. The Contractor shall comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. The Contractor shall perform the work with persons experienced and qualified to produce workmanship specified.

E. The Contractor shall maintain quality control over suppliers and Subcontractors.

F. The Contractor shall be responsible for scheduling Subcontractors in a timely fashion.

1.12 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

1.13 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 - PRODUCTS

2.01 GENERAL

A. Manufacturers - See Appendix A at the end of this document for pre-approved materials.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. The Contractor shall provide all components needed for complete and satisfactory installation and operation.

D. Product Availability

1. The Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2. Subject to compliance with these specifications, products and systems included in this section are to be installed as specified by the manufacturer of the system or engineer approved equal.

2.02 EQUIPMENT

A. See Appendix A at the end of this document for pre-approved materials.

B. Substitutions require proof of equivalence and prior approval by District and/or its representative before ordering.

C. Whenever possible and required the request to exit functionality shall be integrated into the door hardware.

D. Electrified latch hardware shall be compatible with panic hardware and be “rim” style.

E. Control panel cabinets shall have key locks.

F. For sites with no prior access control systems the first access control project shall furnish at least 250 RFID cards serialized per the District’s standards via Schlage CardTrax. The District’s CardTrax number is CTXRAY8239. See Appendix A for more information.

2.03 LICENSES

A. The Contractor shall provide ACM (or Unity) card reader licenses in quantities equal to or greater than the number of installed card readers. Verify with the District for license version.

2.04 EXTRA STOCK

A. For each increment of 40 controlled doors furnish:

1. Quantity of 1, the current model door controller.

2. Quantity of 5, the current model card readers.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The equipment shall only be installed by Contractors who are qualified to install and maintain the system.

B. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience installing electronic access control equipment before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to bidding the job. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for observing and considering those conditions which a Contractor would have observed and considered during a site visit, estimating properly the difficulty and cost of successfully performing the Work or proceeding to perform the Work without additional cost to District.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall verify materials are readily available prior to submitting product submittals and notify the District's Project Manager of long lead time items.

B. The Contractor shall order all required parts and equipment only after receipt of approved product submittals from the District's Project Manager.

C. Submit and receive approval of shop drawings prior to work commencement.

3.04 AT DOOR PATHWAY INSTALLATION

A. New Construction:
   1. All doors shall have access control pathways installed regardless of whether door is access controlled or not.
   2. Install 3/4" EMT conduits in wall from hollow door frame (both sides of the door frame) to a double-gang mud-ring and deep 4" Sq. electrical back box above accessible ceiling space. Stub conduit into accessible ceiling area.
   3. "Store Front" doors shall also have pathway to both sides of door frames.
   4. For doors with no direct accessible ceiling conduit shall be routed to nearest accessible ceiling area or continuous conduit to nearest IDF.

5. For doors with adjacent walls a single-gang mud-ring and back box shall be installed on the exterior (key side) strike side of the door at 48” AFF/AFG to top of box for card readers. Route EMT conduit to above door 4”-Sq. j-box.
6. For “Store Front” door card readers are to be mullion mount with their tops at 48” AFF/AFG on the strike side of the door.
7. Door position switches (for exterior doors only) to be installed in top door frame at 8”-10” (2” or more from intrusion door contact switches) from strike side of the side door frame.

B. Existing Construction:
1. Refer to design documents.
2. Surface raceway and components shall be Wiremold 2300.

3.05 EQUIPMENT INSTALLATION

A. Power supplies and electric strike to use 24VDC and 16AWG wire.

B. Power supplies shall be centrally located in the nearest MDF/IDF.

C. Equipment to be wired and installed per the manufacturer’s instructions.

D. Door controllers to be installed in nearest MDF/IDF unless noted otherwise on design documents.

E. Devices requiring POE power shall be connected to a POE switch in the nearest MDF/IDF data rack – verify with Electronics for available PoE.

F. All wiring in enclosure shall have 12” minimum service loop for troubleshooting/repairs.

G. All shielded wiring to have shields grounded at the upstream end only. Floating shields are strictly prohibited.

H. Data drops to be installed inside the controller panel cabinet.

I. Card reader cable runs exceeding 200’ shall use 18 AWG wire.

3.06 LABELING/SCHEDULES

A. All labels are to be machine generated black letters on white adhesive label stock that is appropriate for the installation environment (interior/exterior).

B. Device ID Labels are to be 1/4” lettering for mounting heights 10’ AFF or less, 1/2" black lettering on white labels for mounting heights greater than 10’ AFF.

C. Access Control Panel/Cabinet label – Panel ID label to be installed on exterior top right of the cabinet door.

D. Power circuit label – Line power circuit and electrical panel identifications are to be labeled on the exterior top left of the cabinet door. If the electrical panel is not in the same room – the room identifier for the electrical panel shall also be indicated.

E. Battery label – Install date.

F. Wiring label – Panel ID-Panel Schedule-Door ID.

G. Network Information label – MAC and IP address on interior top right of panel door.

H. Network Cable Termination label - MDF/IDF-port number.

I. Reader/Door schedule – A reader/door schedule and location drawing shall be printed and installed in a plastic sleeve inside the panel cover door.

3.09 CONFIGURATION

A. The Contractor shall purchase and deliver to the District ACM/Unity licenses for this project.

B. Under Review.
With 3-weeks lead time, deliver door controllers and associated card readers for programming of the door controllers by the District. Include a letter of transmittal documenting the equipment delivered to the District. Coordinate with project construction manager.

C. Under Review.
With 3-weeks lead time, deliver video intercom units for programming by the District. Include a letter of transmittal documenting the equipment delivered to the District. Coordinate with project construction manager.

D. Under Review.
Program all network equipment with network IP address information obtained from Electronics Shop.

B. All equipment to be fully configured and tested for functionality prior to testing.

3.10 FIELD QUALITY CONTROL AND TESTING

A. Upon reaching substantial completion, perform a complete test and inspection of the system. If it is found to be installed and operating properly, notify District of your readiness to perform the formal Test & Inspection of the complete system.

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system the Contractor shall have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. Notify the District when ready to perform a re-inspection of the installation.

F. The District or its representative to provide final sign-off for acceptance.

3.11 AS-BUILT DRAWINGS

A. See section 27 00 00 for requirements.

B. As-built riser diagram showing all access control components for site.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Door Controller (1-door)	Avigilon/Mercury	AC-MER-CONT-MP1501/MP1501
Door Controller (2-door)	Avigilon/Mercury	AC-MER-CONT-MP1502/MP1502
2-Reader Interface Module	Avigilon/Mercury	AC-MER-CON-MR52/MR52-S3
Card Reader	Schlage	MTB15, MTB15-485(OSDP)
Card Reader/Mullion	Schlage	MTB11, MTB11-485(OSDP)
Power Supply/Cabinet (2 Door)	Avigilon/LifeSafety Power	AC-LSP-2DR-MER-LCK
Power Supply/Cabinet (4 Door)	Avigilon/LifeSafety Power	AC-LSP-4DR-MER-LCK
Power Supply/Cabinet (8 Door)	Avigilon/LifeSafety Power	AC-LSP-8DR-MER-LCK
Power Supply/Cabinet (16 Door)	Avigilon/LifeSafety Power	AC-LSP-16DR-MER-LCK
Video Intercom	Avigilon	3.0C-H4VI-RO1-IR
Electronic Surface Strike (Rim Style)	Assa Abloy/HES	9600
Electronic Strike (Door Frame)	Assa Abloy/HES	8000C-630/805 Faceplate (Wood Frames)
Electronic Latch Set/Cylindrical (REX)	Schlage	ND96EUPD-(RX)
Latch Retraction Motor (Von Duprin) with REX	Von Duprin	QEL-RX
Power Transfer	Von Duprin	EPT-10
Door Position Switch	George Risk Industries, Inc. Resideo	195-12WG 7939WG-BR
Battery 12VDC, 8AH	ELK Powersonic	ELK-1280 PS-1280
Proximity Cards	Schlage	8543 - Serialized per District Requirements Via Schlage CardTrax # CTXRAY8239, Bit: 37X, FC: 5735
ACM v.6 (or Unity) Card Reader License	Avigilon	Note: Quantity Per Number of Card Readers. Verify version with District
Armored Door Loop	Seco-Larm	SD-969-S18Q, SD969-S18/K
Armored Gate Loop	Locinox	DVK-HD-450

END OF APPENDIX A
END OF SECTION

~~SECTION 28 20 00~~

~~VIDEO SURVEILLANCE~~
~~Please delete this highlighted page prior to issuance.~~

~~All Users and Designers! This page is for your information only to provide information on the latest update to this specification so that you don't hashave to traipse line by line looking for the last edit. Please delete this page prior to issuance.~~

~~09/30/2022 – Initial Section creation/edits~~
~~01/09/2023 – Appendix A updates~~
~~02/28/2023 – Edits from meetings with District~~
~~04/04/2023 – Update Camera P/N~~
~~06/20/2023 – Updated Camera P/N~~
~~11/12/2024 – add 2-sensor camera~~
~~01/3129/2025 – Updates to Appendix A~~
~~11/076/2025 – Updates to Appendix A~~

~~DISTRICT DESIGN STANDARDS~~

~~All Users and Designers! The information shown below areis provided by the District to convey the District's thought process on manufacturers, products, procedures, etc. These items are to assist the design team with understanding what to use as part of the design along with those items that the District does not want to be installed or used on their school sites. Please delete this page prior to issuance.~~

~~01/31/2025 Designer to evaluate:~~
~~1. Existing analog camera installinstallation for potential replacement with IP cameras.~~
~~2. Existing network video recorder (NVR) available capacity and provide upgrades if required.~~
~~3. Network switch power over ethernet (PoE) available capacity and provide upgrades if required.~~
~~4. Lighting at proposed camera location for modification/add coordination with Electrical.~~
~~5. Existing low-voltage pathway and provide upgrades if required.~~

~~11/07/2025 Designer to evaluate:~~

~~Special attention shall be given to cable runs that exceed the 90meter Cat6A limit.~~

SECTION 28 20 00

VIDEO SURVEILLANCE

PART I - GENERAL

1.01 SUMMARY

A. This section specifies software, equipment, accessories, wire, materials, installation, configuration, and testing requirements for a complete and operable Video Surveillance system. The system shall provide electronic recording/playback and monitoring of digital cameras installed at the site.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:
   1. Labor and Materials: The Contractor shall provide and pay for all labor, supervision, materials, accessories, wire, components, equipment, tools, transportation, and other facilities and services necessary for the proper installation of a turn-key Video Surveillance system to District.

A. The CCTV system shall have the following minimum requirements.
   1. Cameras
      a. Weather resistant IP67 or greater (exterior only)
      b. Network/IP based
      c. PoE powered
      d. 5MP or 4K resolution
      e. H.265 video compression
      f. Day/night with IR illumination
      g. Motion detection
      h. ONVIF
   2. Network Video Recorder
      a. Network/IP based
      b. H.265 video compression
      c. RAID 5 or greater
      d. Record on motion detection
      e. 30+ day recording
   C. Software
      a. PC and Mobile viewing
      b. View live and recorded video
      c. Search
      d. Save video to MP4 format

e. Notifications

1.03 RELATED REQUIREMENTS

A. Division 01 - General Requirements

B. Section 27 00 00 - Communications

C. Section 27 05 00 - Common Work Results for Communication Systems.

C. Section 27 10 00 - Structured Cabling

1.04 QUALIFICATIONS

A. Contractor shall be located within 50 miles or less from the project site to support 2-hour response time.

B. Five years' experience installing Video Surveillance equipment systems.

1.05 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing Video Surveillance system.

1.06 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

A. See section 27 00 00 for requirements.

B. Shop drawings are required for this section

1.07 SUBMITTALS

A. See section 27 00 00 for requirements.

1.08 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

1.09 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 - PRODUCTS

2.01 GENERAL

A. See Appendix A at the end of this document for pre-approved materials.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. Contractor shall provide all components needed for complete and satisfactory installation/operation.

D. Product Availability

1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2. Subject to compliance with these specifications, products and systems included in this section are to be installed as specified by the manufacturer of the system or engineer approved equal.

2.02 EQUIPMENT

A. The District's preferred manufacturer for CCTV equipment is i-Pro (formally Panasonic) for cameras and network video recorders (NVR).

B. The District's preferred manufacturer for video intercom is Avigilon.

C. Substitutions require proof of equivalence and approval by District and/or its representative.

D. All exterior cameras to be IP67 rated or better.

E. The Contractor shall provide and install a rack-mounted monitor/keyboard in the rack where the NVR is located.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The equipment shall only be installed by Contractors who are qualified to install and maintain the system.

B. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience installing Video Surveillance equipment before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to job bidding. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for observing and considering those conditions which a Contractor would have observed and considered during a site visit, estimating properly the difficulty and cost of successfully performing the Work or proceeding to perform the Work without additional cost to District.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall verify materials are readily available prior to submitting product submittals and notify the Project Manager of long lead time items.

B. The Contractor shall order all required parts and equipment only after receipt of approved product submittals from the Project Manager.

C. The Contractor shall coordinate with the District's Technology Services department for needed IP addresses at least 2 weeks prior to configuration/installation.

3.04 SHOP DRAWINGS

A. The Contractor shall create "Shop Drawings" per section 27 00 00.

3.05 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District's Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. Perform Work with persons experienced and qualified to produce workmanship specified.

E. Maintain quality control over suppliers and Subcontractors.

3.06 PATHWAY AND EQUIPMENT INSTALLATION

A. Install all conduit and pathway per design documents. Refer to 27 05 00 for additional information/requirements.

B. Install all Cat6~~/6~~A cables per design documents. Refer to Section 27 10~~5~~ 00 for additional information/requirements.

C~~B~~. Equipment to be installed per manufacturer's instructions.

D~~C~~. Devices requiring PoE power shall be connected to a PoE switch in the MDF/IDF data rack – verify ~~with Technology Services~~for adequate PoE power capacity ~~for available PoE power~~.

E. The Contractor shall provide and install a rack-mounted monitor/keyboard in the rack where the NVR is located. Install at a minimum 36" to a maximum of 45" AFF.

3.07 CONFIGURATION

A. Program cameras and/or NVR with network IP address using the following scheme.
Note: x=site octet, contact District Electronics shop for site information.
1. Cameras: 10.x.253.101 = Camera 1, 10.x.253.102 = Camera 2…
2. NVR: 10.x.253.5~~1~~
3. POE Switch: 10.x.253.10 = 1st switch, 10.x.253.11 = 2nd switch…
4. Gateway: 10.x.0.1
5. Subnet Mask: 255.255.0.0

B. All equipment to be fully configured and tested for functionality prior to District acceptance testing.

3.08 CAMERA VIEW

A. Adjust view aim, zoom and focus camera to show intended view from design documents.

3.09 FIELD QUALITY CONTROL AND TESTING

A. Upon completion of network programming and initial view setting, notify District of your readiness to perform the formal camera view review with District or its representative. Make all adjustments required from District review.

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system, Contractor to have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. Notify the District when ready to perform a re-inspection of the installation.

3.10 AS-BUILT DRAWINGS

A. See section 27 00 00 for requirements.

APPENDIX A – Pre-Approved Materials

VIDEO SURVEILLANCE:

~~DESCRIPTION~~	~~MFG.~~	~~PART NUMBER~~
~~Network Video Recorder 48TB~~	~~i-PRO~~	~~NVR-RL-2-48TB-V3~~
~~NVR license~~	~~i-PRO~~	~~ASM-300~~
~~Network Dome Camera, Outdoor, Vandal Resistant, 5MP with Base Bracket~~	~~i-PRO~~	~~WV-S25500-V3LG2552L~~
~~Network Dome Camera, Indoor, 5MP with Base Bracket~~	~~i-PRO~~	~~WV-S22500-V3L~~
~~Network Multi-Directional Camera, Outdoor (3x4MP Sensors)~~	~~i-PRO~~	~~WV-S8543LG~~
~~Network Multi-Directional Camera, Outdoor (4x4MP Sensors)Network Camera, Outdoor 360-degree, Vandal Resistant, 5MP with Base Bracket~~	~~i-PROi-PRO~~	~~WV-S4551LWV-S8544LG~~
~~Pendant Wall Mount Kit~~	~~i-PRO~~	~~PWM485S~~
~~Pendant Corner Mount Kit~~	~~i-PRO~~	~~PCM485S~~
~~Pendant Pole Mount Kit~~	~~i-PRO~~	~~PPM485S~~
~~Wall Mount Bracket~~	~~i-PRO~~	~~WV-QWL500-W~~
~~Back Box~~	~~i-PRO~~	~~WV-QJB500-W~~
~~Corner Bracket~~	~~i-PRO~~	~~WV-QCN500-W~~
~~Sunshade~~	~~i-PRO~~	~~WV-QSR500-W~~
~~Dome Cover~~	~~i-PRO~~	~~WV-CW7SN~~
~~2 RU Din Rack Mount Adapter~~	~~Antaira~~	~~DIN-Rack-2U~~
~~240W Power Supply~~	~~Antaira~~	~~NDR-240~~
~~960W Power Supply~~	~~Antaira~~	~~SDR-960-48~~
~~10-Port Industrial Gigabit PoE+ Managed Ethernet Switch~~	~~Antaira~~	~~LMP-1002G-SFP~~
~~20-Port Industrial Gigabit PoE+ Managed Ethernet Switch~~	~~Antaira~~	~~LMP-2004G-SFP~~
~~28-Port Industrial Gigabit PoE+ Switch 1RU~~	~~Antaira~~	~~LNP-2804GN-SFP-T~~
~~Gigabit Ethernet-Single Mode Transceiver~~	~~Antaira~~	~~SFP-S10-T~~
~~Video Intercom~~	~~Avigilon~~	~~3.0C-H4VI-RO1-IR~~
DESCRIPTION	MFG.	PART NUMBER
Network Video Recorder (96TB)	i-PRO	NVR-RL-2-96TB-V5
NVR License (i-PRO Management Software)	i-PRO	WV-ASM300
Network Dome Camera, Indoor, 5MP	i-PRO	WV-S22500-V3L
~~Network Multi-Directional Camera Dual Sensor, Outdoor (2x4MP Sensors)~~	~~i-PRO~~	~~WV-U85402-V2L~~
Network Dome Camera, Outdoor, Vandal Resistant, 5MP	i-PRO	WV-S25500-V3L
Base Bracket for Dome Camera (Outdoor)	i-PRO	WV-QJB501-W
Sunshade for Dome Camera (Outdoor)	i-PRO	WV-QSR505-W
Network Dual Sensor Camera, Outdoor (2x4MP Sensors)	i-PRO	WV-U85402-V2L
Network Multi-Directional Camera, Outdoor (3x4MP Sensors)	i-PRO	WV-S8543L
Network Multi-Directional Camera, Outdoor (4x4MP Sensors)	i-PRO	WV-S8544L
Wall Mount Bracket for Multi-Directional Cameras	i-PRO	WV-QWL506-W
Wall Mount Bracket Adapter for Multi-Directional Cameras	i-PRO	WV-QSR503-W
Ceiling Mount Bracket for Multi-Directional Camera	i-PRO	WV-QJB503-W
Pole Mount Bracket for Cameras	i-PRO	WV-QPL500-W

Corner Mount Bracket for Cameras	i-PRO	WV-QCN500-W
~~24-port SFP+ Managed Aggregation Network Switch~~	~~Aruba~~	~~JL658A~~
~~250W Power Supply for Aruba Network Switch (JL658A)~~	~~Aruba~~	~~JL085A~~
~~24-Port Gigabit PoE+ Managed Network Switch~~	~~Aruba~~	~~R8Q68A~~
~~1050W Power Supply for Aruba Network Switch (R8Q68A)~~	~~Aruba~~	~~JL087A~~
~~10G SFP+ LC LR SMF Transceiver for Aruba Network Switches~~	~~Aruba~~	~~J9151E~~
~~10GBASE-T SFP+ RJ45 Cat6A Transceiver for Aruba Network Switches~~	~~Aruba~~	~~JL563B~~
~~2 RU Din Rack Mount Adapter~~	~~Antaira~~	~~DIN-Rack-2U~~
~~35mm Steel DIN-Rail Track (10")~~	~~Antaira~~	~~DIN-RAIL-10~~
~~35mm Steel DIN-Rail Track (20")~~	~~Antaira~~	~~DIN-RAIL-20~~
~~240W Power Supply~~	~~Antaira~~	~~NDR-240~~
~~480W Power Supply~~	~~Antaira~~	~~SDR-480-48~~
~~10-Port Industrial Gigabit PoE+ Managed Ethernet Switch~~	~~Antaira~~	~~LMP-1002G-SFP~~
~~20-Port Industrial Gigabit PoE+ Managed Ethernet Switch~~	~~Antaira~~	~~LMP-2004G-SFP~~
~~28-Port Industrial Gigabit PoE+ Switch 1RU~~	~~Antaira~~	~~LNP-2804GN-SFP-T~~
~~Gigabit Ethernet-Single Mode Transceiver~~	~~Antaira~~	~~SFP-S10-T~~
Video Intercom	Avigilon	3.0C-H4VI-RO1-IR
Rack mounted slide out keyboard/monitor	TrippLite	B021-SWHD-K
Long range point-to-point Ethernet & PoE Extender (Base)	Veracity	VLS-1P-B
Long range point-to-point Ethernet & PoE Extender (Camera)	Veracity	VLS-1P-C

END OF APPENDIX A

END OF SECTION

SECTION 28 31 00
INTRUSION DETECTION

REVISION SUMMARY
Please delete theise highlighted pages prior to issuance.

All Users and Designers! This page is for your information only to provide information on the latest update to this specification so that you don't have to traipse line by line looking for the last edit. Please delete this page prior to issuance.

09/30/2022 – Initial Section creation/edits
06/20/2023 – Updates to Appendix A
10/24/2023 – Update Honeywell to Resideo
2/29/2024 – update Appendix A for wire
01/31/2025 – annual update. Update Appendix A for IP communicator
11/07/2025 – annual update Updated Appendix A for Bosch

DISTRICT DESIGN STANDARDS

All Users and Designers! The information shown below is provided by the District to convey the District's thought process on manufacturers, products, procedures, etc. These items are to assist the design team with understanding what to use as part of the design along with those items that the District does not want to be installed or used on their school sites. Please delete this page prior to issuance.

09/30/2022 – Designer to evaluate:
1. Existing system capacity

01/31/2025 – Designer to evaluate:
District is evaluating Bosch as an approved product line – confirm with District for product selection. (see 11/07/2025 update)

11/07/2025 – Designer to evaluate:
1. District has selected Bosch as the approved product line.

SECTION 28 31 00
INTRUSION DETECTION

PART I - GENERAL

1.01 SUMMARY

A. This section specifies equipment, accessories, materials, wire, installation, configuration, and testing requirements for a complete and operable electronic Intrusion Detection system. The system shall provide intrusion alarm notification, monitoring, command and control and be connected to the District's existing UL listed monitoring station.

1.02 SCOPE

A. The work will include but not be limited to the following objectives:

1. Labor and Materials: The Contractor shall provide and pay for all labor, supervision, materials, accessories, components, equipment, tools, transportation, and other facilities and services necessary for the proper installation of a turn-key Intrusion Detection system to the District.

2. The contractor will coordinate with the District in writing for any needed information (i.e. IP addresses, etc.) at least 2 weeks prior to date the information is needed.

3. Intrusion detection equipment: Includes, but is not limited to:
   a. Control panels
   b. Keypads
   c. Motion detectors
   d. Door contacts
   e. Glass break detectors
   f. Monitor modules
   g. Wire

4. Typical installation includes a central control panel and keypad with distributed motion detection and/or door contacts for rooms requiring intrusion detection.

5. All installations with network connectivity shall utilize District's network.

6. All control panels shall have battery backup.

1.03 RELATED REQUIREMENTS

A. Division 01 – General Requirements

B. Section 27 00 00 - Communications

C. Section 27 05 00 – Common Work Results for Communication Systems.

D. Section 27 10 00 – Structured Cabling

1.04 REFERENCES

A. See section 27 00 00 for requirements.

1.05 DEFINITIONS

A. See section 27 00 00 for requirements.

1.06 SYSTEM REQUIREMENTS

A. Any new installations or existing system modifications shall seamlessly integrate into the site's existing Intrusion Detection system.

1.07 SUBMITTALS

A. See section 27 00 00 for requirements.

1.08 ~~1.08~~ CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

A. ~~A.~~ See section 27 00 00 for requirements.

B. Shop drawings are required for this section.

1.09 QUALIFICATIONS

A. Contractor shall be located within 50 miles or less from the project site to support 2-hour response time.

B. Five (5) years' experience installing ~~communications~~ intrusion detection equipment systems.

1.10 CERTIFICATIONS

A. See section 27 00 00 for requirements.

1.11 WORKMANSHIP

A. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship.

B. The District's Project or Construction Manager will have the authority to reject Work which does not conform to the Drawings and Specifications.

C. The Contractor shall comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.

D. The Contractor shall perform the work with persons experienced and qualified to produce workmanship specified.

E. The Contractor shall maintain quality control over suppliers and Subcontractors.

F. The Contractor shall be responsible for scheduling Subcontractors in a timely fashion.

1.12 WARRANTY

A. Refer to Division 01 Warranty section.

B. See section 27 00 00 for additional requirements.

1.13 CLOSEOUT DOCUMENTS

A. See section 27 00 00 for requirements.

PART 2 - PRODUCTS

2.01 GENERAL

A. Manufacturers ~~—~~ The District standard is for Bosch Intrusion Detection Equipment (See Appendix A for pre-approved materials) ~~at the end of this document for pre-approved materials~~.

B. All products shall be new, unused and without blemishes and shall be of manufacturer's current and standard production.

C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. The Contractor shall provide all components needed for complete and satisfactory installation and operation.

D. Product Availability

1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2. Subject to compliance with these specifications, products and systems included in this section are to be installed as specified by the manufacturer of the system or engineer approved equal.

2.02 EQUIPMENT

A. See Appendix A at the end of this document for pre-approved materials.

B. Substitutions require proof of equivalence and prior approval by District and/or its representative before ordering.

C. The control panel cabinet shall have a key lock.

D. The control panel cabinet shall have backup batteries.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. The equipment shall only be installed by Contractors who are qualified to install and maintain the system.

B. The Contractor (or subcontractor listed at time of bid) must have at least five (5) years' experience installing electronic intrusion detection equipment before the Bid Opening Date.

3.02 EXAMINATION

A. The Contractor shall be required to visit the installation site(s) prior to bidding the job. The Contractor acknowledges that the failure to visit the site(s) will not relieve the Contractor of the responsibility for observing and considering those conditions which a Contractor would have observed and considered during a site visit, estimating properly the difficulty and cost of successfully performing the Work or proceeding to perform the Work without additional cost to District.

B. The Contractor shall report any discrepancies between the Specifications, Drawings, and Site Examination prior to the Bid Opening Date.

3.03 PREPARATION

A. The Contractor shall verify materials are readily available prior to submitting product submittals and notify the District's Project Manager of long lead time items.

B. The Contractor shall order all required parts and equipment only after receipt of approved product submittals from the District's Project Manager.

C. The Contractor shall submit and receive approval for submitted shop drawings prior to work commencement.

3.04 PATHWAY INSTALLATION

A. See Division 26 and Section 27 05 00 for requirements and more information.

B. Existing Construction:
   1. Refer to design documents.
   2. Surface raceway and components shall be Wiremold 2300.

3.05 EQUIPMENT INSTALLATION

A. Equipment to be wired and installed per the manufacturer's instructions.

B. All wiring in enclosure shall have 12" minimum service loop for troubleshooting/repairs.

C. ~~All shielded wiring to have shields grounded at the upstream end only. Floating shields are strictly prohibited.~~

~~D.~~ Data drops to be installed inside the control~~controller~~ panel cabinet.

3.06 LABELING/SCHEDULES

A. All labels are to be machine generated black letters on white adhesive label stock that is appropriate for the installation environment (interior/exterior).

B. Device ID Labels are to be 1/4" lettering for mounting heights 10' AFF or less, 1/2" black lettering on white labels for mounting heights greater than 10' AFF.

C. Intrusion Control Panel/Cabinet label – Panel ID on exterior top right of panel door.

D. Battery label – Install date.

E. Wiring label – Panel, ID-Zone/Circuit.

F. Network Information label – MAC and IP address on interior top right of panel door.

G. Network Cable Termination label - MDF/IDF-port number.

H. Zone schedule – A zone schedule and device location drawing shall be printed and installed in a plastic sleeve inside the panel cover door.

3.09 CONFIGURATION

A. Program all network equipment with network IP address information obtained from Technology Services.

B. All equipment to be fully configured and tested for functionality prior to testing.

3.10 FIELD QUALITY CONTROL AND TESTING

A. Upon reaching substantial completion, the Contractor shall perform a complete test and inspection of the system. If found to be installed and operating properly, the Contractor

shall notify District of your readiness to perform the formal Test & Inspection of the complete system.

B. Submit the Record Drawings (as-builts) to District for review prior to inspection.

C. During the formal Test & Inspection (Commissioning) of the system, the Contractor shall have personnel available with tools and equipment to inspect wiring, devices, and system operation.

D. If corrections are needed, the Contractor will be provided with a Punch-List of all discrepancies. Perform the needed corrections in a timely fashion.

E. The Contractor shall notify the District when ready to perform a re-inspection of the installation.

F. The District or its representative to provide final sign-off for acceptance.

3.11 AS-BUILT DRAWINGS

A. See section 27 00 00 for requirements.

B. As-built riser diagram showing all components for project.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Intrusion Control Panel~~Intrusion Control Panel~~	BOSCH~~Resideo~~	B9512G~~Vista-250BPT~~
Dual Battery Harness	BOSCH	D122
Transformer	BOSCH	D1640
Lock and Key Set~~Transformer~~	BOSCH~~Ademco~~	D101~~1361~~
Fire Enclosure~~IP Enterprise Communicator~~	BOSCH~~Honeywell~~	D81097~~847i-E~~
Transformer Enclosure~~Keypad~~	BOSCH~~Resideo~~	D80046~~160~~
Keypad~~Motion Detector (V-Plex)~~	BOSCH~~Resideo~~	D920~~IS3050A-SN~~
POPEX Module~~Monitor Module (V-Plex)~~	BOSCH~~Resideo~~	B2994~~193SNP~~
POPIT module~~Glass-Break Sensor (V-Plex)~~	BOSCH~~Resideo~~	D9127U4~~FG1625SN~~
Bosch Wall motion detector~~Horn~~	BOSCH~~Resideo~~	ZX935Z~~748~~
Wall-mount gimbal~~Swivel~~	DSC/DM-W~~DSC~~	DM-W~~DM-W~~
Ceiling-mount gimbal~~Door Position Switch (metal door/frame)~~	DSC/DM-C~~George Risk Industries, Inc.~~ ~~Resideo~~	DM-C~~195-12WG~~ ~~7939WG BR~~
Door Contact Switch (metal door/frame)(DPDT)~~Door Position Switch (surface)~~	George Risk Industries, Inc.~~George Risk Industries, Inc.~~	195-12WG~~29A~~
Door Contact Switch (surface)~~Roll-up Door Contact~~	George Risk Industries, Inc.~~George Risk Industries, Inc.~~	29A~~4532~~
Roll-up Door Contact~~Battery 12VDC, 8AH~~	George Risk Industries, Inc.~~ELK, Powersonic~~	4532~~ELK-1280, PS-1280~~
Terminal/Barrier Strip~~Cable, 18-2, Interior, White~~	IDEAL INDUSTRIES~~West Penn~~	89-608~~224~~
Battery 12VDC, 8AH~~Cable,~~	ELK,	ELK-1280,

~~18-2, OSP~~	PowersonicWest Penn	PS-1280AQ-224
Cable, 18-2, Interior, WhiteCable, 18-4 Interior, Gray	West PennWest Penn	224244
Cable, 18-2, OSPCable, 18-2, OSP	West PennWest Penn	AQ-224AQ-244
Cable, 18-4 Interior, Gray	West Penn	244
Cable, 18-2, OSP	West Penn	AQ-244

END OF SECTION

SECTION 28 46 00

FIRE DETECTION AND ALARM

PART 1 – GENERAL

1.01 SUMMARY

A. This section specifies equipment, accessories, wire, materials, installation, configuration and testing requirements for a complete and operable Fire Detection and Alarm system. The system shall provide fire alarm detection, notification, monitoring, command, and control and be connected to the District's existing UL listed monitoring station. New construction shall be Emergency Voice Alarm Communication (EVAC) compliant.

1.02 SCOPE

A. The installed Fire Alarm system shall comply with all requirements of currently adopted version of NFPA 72.

B. Quality workmanship is a high priority for the District and the Contractor shall be held to a high-level of professional workmanship. Contractors unfamiliar with the District's standards shall familiarize themselves with the District's standards and requirements prior to beginning work.

C. For new building construction on an existing campus – provide and install all components and accessories as outlined in the design documents for a complete and operable system that extends and seamlessly integrates into the existing campus' Fire Alarm system.

D. For construction in existing buildings - provide and install all components and accessories as outlined in the design documents to modify the existing system while maintaining code compliance and to seamlessly integrate the new components into the existing campus' Fire Alarm system. Prior to beginning any work, the Contractor is responsible for identifying any existing system errors or faults and bring these issues to the attention of the District Project Manager.

E. Labor and Materials: The Contractor shall provide and pay for all labor, materials, equipment, tools, utilities, construction equipment and machinery, transportation and other facilities and services necessary for the proper execution, operation, and completion of the Work

F. Contractor shall furnish and install all new conduit/raceway and wire as indicated on the project drawings and/or as required to provide a turn-key system to the District.

G. The Contractor shall be responsible for programing of all Fire Alarm Control Panel(s) (FACP) site wide.

H. With one-week notice the Contractor shall coordinate with the District staff for monitoring connectivity.

I. Prior to final programming the contractor shall review the proposed final system programming, functionality and expectations with the District project manager, and/or Designer/Engineer. If the system is programmed without approval, all subsequent requested programming changes by the District will be at the Contractor's expense.

J. After completion of the installation and 100% pretest of the system, a satisfactory final test (compliant with NFPA 72 requirements) of the entire system shall be made in the presence of the inspector of record (IOR) and District or the District's representative.

K. Provide District an electronic copy of final test results.

L. Existing system shall remain operable until new system is accepted and approved by the IOR and the District or its representative.

M. The Contractor is responsible for user/operator training (2 hours).

N. The Contractor shall complete all required project closeout documentation in a timely fashion.

O. A single speaker/strobe notification appliance may be used for both Fire alarm and CO detection notification. However, the device shall NOT have the word "FIRE" and requires a distinct temporal (3 or 4) coding with distinct voice notification (see DSA IR 9-2 for more information).

1.03 RELATED REQUIREMENTS:

A. Division 01 – General Requirements

B. Division 26 – Electrical

C. Section 27 00 00 – Communications

D. Section 27 05 00 – Common Work Results for Communication Systems

1.05 CODES AND STANDARDS:

A. The installed system shall conform to all California State Codes
   1. 2022 California Building Code (CBC)

2. 2022 California Electrical Code (CEC)
3. 2022 California Fire Code (CFC)
4. All equipment shall have California State Fire Marshall listing(s)
5. DSA IR 9-1 Emergency Voice/Alarm Communication Systems
6. DSA IR 9-2 Carbon Monoxide Detection Requirements for Group E Classrooms and Group I-4 Occupancies

B. National Fire Protection Association (NFPA) - USA:
1. 2020 NFPA 70 - National Electric Code (NEC)
2. 2022 NFPA 72 - National Fire Alarm Code (NFPA 72)
3. 2021 NFPA 101 - Life Safety Code (NFPA 101)
4. Americans with Disabilities Act (ADA)

C. Local building codes

D. All requirements of the Authority Having Jurisdiction (AHJ)

1.06 UNDERWRITERS LABORATORY (UL) LISTING

A. All equipment shall be UL listed for its intended purpose.

B. Any modification that voids the equipment's UL listing is strictly prohibited (i.e. relocated or oversize knock-outs).

C. Any modified new equipment that voids the UL listing shall be replaced by the Contactor (parts and labor) at their expense.

1.07 QUALIFICATIONS:

A. The Contractor shall possess a California C10 license.

B. The installation Contractor or Subcontractor shall be FACP manufacturer authorized to provide and install equipment with 5 years of documented experience.

C. The programming technician shall possess a valid manufacturer's programming certification.

D. The Contractor shall have at least one NICET certified in Fire Alarm Technology, level II (or greater) personnel as the on-site supervising technician who is always on site when Fire Alarm activities are taking place.

E. The installation company and its subcontractors shall have an office located within 50 miles of the project site.

1.07 REFERENCES

A. See Section 27 00 00

1.08 SYSTEM REQUIREMENTS

A. Site Compatibility

1. Any new installations or modifications to an existing system shall seamlessly integrate into the site's existing Fire Alarm system.

1.09 CONTRACTOR "SHOP DRAWINGS" DESIGN REQUIREMENTS

A. See Section 27 00 00 for requirements.

B. Shop Drawings are required for this project.

1.10 SUBMITTALS

A. See Section 27 00 00 for requirements.

B. Provide copies of certificates listed in the QUALIFICATIONS section above.

1.11 WARRANTY

A. Refer to Division 01 Warranty section.

B. After the satisfactory completion letter has been received, a continuous and fault free thirty (30) day "burn-in" period shall begin. Any fault shall reset the "burn-in" period to zero (0). Warranty shall commence at day 31 of a successful and continuous "burn-in" period.

PART 2 – PRODUCTS

2.01 EQUIPMENT AND MATERIAL, GENERAL:

A. The District preferred fire alarm control panel manufacturers are FireLite for Elementary and Notifier for Middle and High Schools.

B. See Appendix A for pre-approved equipment listings.

C. All products shall be new and unused and shall be of manufacturer's current and standard production.

D. Where two or more equipment items of the same kind are provided, all shall be identical and provided by the same manufacturer.

E. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. The Contractor shall provide all components needed for complete and satisfactory system operation.

F. Product availability:

1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.

2. Certain products specified may only be available through factory authorized dealers and distributors. The Contractor shall verify his ability to procure the products specified prior to submitting a proposal.

G. In compliance with DSA IR 9-2 for CO Detection, in areas where CO detection is needed EVAC notification appliances will be utilized for Fire Alarm and Carbon Monoxide alerts, promoting a building wide evacuation. For this reason, interior notification appliances (Speaker/Strobes) shall not have the word “FIRE” on the device.

2.02 CONDUIT AND RACEWAY

A. See Section 27 05 00 for conduit and raceway requirements.

2.03 WIRE AND CABLE

A. Provide all new wire and cable required to install systems as indicated on design documents or approved shop drawings.

B. Approved wire and cable manufacturer is West Penn, substitutions require prior approval.

C. All cable shall be jacketed, and jacket color shall be red (OSP cable excluded). No THHN/THWN allowed.

D. All cables shall be specifically designed for their intended use and install requirements (FPL, plenum, direct burial, aerial, etc.).

E. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG solid for initiating device circuits and signaling line circuits, 12 AWG stranded for notification appliance circuits and 14 AWG stranded for emergency voice communication circuits. (Coordinate with wire schedule)

2.05 BATTERIES

A. Shall be new 12-volt, sealed lead-acid type.

B. Battery shall be sized according to calculations on design drawings.

C. Approved battery manufacturer: Powersonic or approved equal

2.06 EXTRA STOCK:

A. For projects with less than 10 new Fire Alarm devices – no extra stock required.

B. For projects with 11 – 50 new Fire Alarm devices – provide extra stock of 1 (ea.) Smoke detector (current model), 1 (ea.) Heat detector (current model) and 1 (ea.) Pull station (current model)

C. For projects over 50 new Fire Alarm devices – provide extra stock of 2 (ea.) Smoke detector (current model), 1 (ea.) CO detector (current model), 1 (ea.) Wall speaker/strobe (current model) and 1 (ea.) Ceiling speaker strobe (current model) per 100 Fire Alarm device increments.

D. For projects over 300 new Fire Alarm devices – provide devices listed in sections C (above) plus 1 (ea.) Power Booster (current model)

PART 3 – EXECUTION

3.01 INSTALLATION:

A. The installing company shall employ a minimum of one National Institute for the Certification in Engineering Technologies (NICET) Fire Alarm Systems, level II technician. To ensure system integrity, the NICET level II technician shall be on site during all fire system related work to guide the installation of conduit, back-boxes, device placement, device installation, programming, pre-testing, and final testing of the system.

B. The District, Inspector of Record (IOR), Construction Manager or an agent of the District shall have the authority to stop work until the certified personnel requirement is met. The Contractor shall be held accountable for meeting completion dates.

C. Installation shall be in accordance with the CBC, CEC, CFC, NFPA 72, local and national codes.

D. Fire Alarm cables shall not be installed in decking flutes as pathway. Any conduit that needs to be located in decking flutes needs to be rigid.

E. All Fire Alarm cables shall be run unexposed (not observable from occupiable space) throughout the entire cable path – either in conduit, on ladder racking, on J-hooks above ceilings or below flooring. Cable runs on J-hooks shall be perpendicular/parallel to building structure – no diagonal runs.

F. All fire devices and panels shall be mounted at the heights indicated on the design plans and shall comply with local, CBC, CEC, CFC, and NFPA 72 codes and standards. Any code discrepancies shall be brought to the Designer/Engineer and Project Manager’s attention.

G. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place with fasteners and supports in accordance with drawings and specifications.

H. Signal line circuits (SLC) for initiating devices shall be wired Class B.

I. Notification appliance circuits (NAC) shall be wired Class B.

J. CO detection to initiate a building-wide evacuation in accordance with DSA IR 9-2.

K. Smoke detectors shall remain covered until operational. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and/or physical damage and may require additional testing and/or replacement.

L. All addressable smoke or heat devices shall have point-id labels (see 3.02 LABELING).

M. All modules with indicator lights (i.e., Monitor Modules & etc.) shall be mounted where the indicator lights are observable from the occupiable space.

N. Smoke relief hatches are to have door contacts installed and monitored with a monitoring module. The opening of the hatch shall produce a Supervisory event notification. Monitoring module height is to be 10’ AFF or less.

O. Fire alarm circuits shall have a red breaker lock on device per NFPA 72 requirements.

P. All modifications to electrical power shall be made by a licensed electrician.

Q. Headend FACP and associated equipment layout per design documents. If no layout exists Contractor to notify and receive guidance from District or District’s representative prior to install.

R. All Duct Smoke Detector / Fire Smoke Damper shutdown to be coordinated with Div 23.

3.02 LABELING

A. All labels are to be machine generated black letters on white adhesive label stock that is appropriate for the installation environment (interior/exterior).

B. Device ID Labels are to be 1/4” lettering for mounting heights 10’ AFF or less, 1/2" black lettering on white labels for mounting heights greater than 10’ AFF.

C. All panels and power supplies shall be labeled indicating AC electrical power panel and circuit breaker number and panel location.

D. All panels and power supplies shall be identified per design plans.

E. All smoke and heat detectors shall be labeled with Point ID affixed to the trim skirt. Labels are to be visible when approaching the device from the room entry.

F. All modules are to be labeled with Point ID and function and/or associated equipment (i.e., FAN SHUTDOWN, HVAC UNIT XX, ATTIC HEAT, etc.)

G. All notification devices shall be labeled with NAC Point ID.

H. All cables in cabinets shall be labeled with function and circuit ID.

I. All end-of-line devices shall have a “EOL” label.

3.03 PANEL PROGRAMMING/SOFTWARE MODIFICATION

A. The contractor shall review the proposed system programming, functionality, expectations with the District or its representative 10 days prior to final programming.

B. The Contractor shall provide the services of a factory trained, and authorized technician to perform all system software modifications, upgrades, or changes on site. No remote programming is allowed.

C. The Contractor shall provide all hardware, software, programming tools and documentation necessary to modify the fire alarm system.

D. Programming syntax shall be consistent with the existing site for label text and numbering scheme.

3.04 PRE-TESTING

A. The entire system shall be checked and pre-tested by the Contractor and shall test free of all faults prior to calling for a final test.

B. Before energizing the cables and wires, check for correct connections and test for open circuits, short circuits, ground faults, continuity, and any physical damage to the cable/wire insulation that may have occurred during installation.

3.05 TESTING AND GUARANTEE

A. Upon completion of the installation of the system, a test consisting of 100% of all newly installed and 10% of existing relevant system components shall be performed to confirm operation and function. This test shall be done in the presence of the Inspector of Record (IOR) and the District or its representative.

B. Provide the Project Manager with 7 days in advance written notice of system readiness for Final Testing and Inspection. The system shall be 100% pre-tested and fully operable with no trouble conditions prior to final test.

C. Provide the service of a NICET level II technician to supervise and participate in all of the adjustments and/or testing of the system.

D. Testing and adjustments – the Contractor shall:

1. Verify that all devices operate per Design documents matrix (matrices).

2. Verify the Point IDs and descriptions as indicated on the updated (redlined) Design Documents Floor Plan.

3. Verify the candela settings of all NAC devices with strobes.

4. Verify the intelligibility for all EVAC notification appliance speakers.

5. Verify and document that sound levels at all EVAC notification appliance speakers meet or exceeds the minimum sound levels as indicated in the design drawings for expected average ambient or maximum sound levels. Testing to be conducted using dBA setting, 5’ above finished floor and 10’ from speaker with a stand-alone meter (Galaxy Check Mate series or equal).

6. Contractor to adjust speaker wattage settings as required to meet sound levels required after testing.

7. Verify proper alarm and trouble of all sprinkler system flow valve(s).

8. Verify that an open circuit on the initiating device circuit activates a trouble signal locally for all circuits.

9. Verify that an open or a short circuit on the signaling line circuit activates a trouble signal locally for all circuits.

10. Verify that an open or short circuit on the notification appliance circuit activates a trouble signal locally for all circuits.

11. Verify that a ground condition on an initiating device circuit activates a trouble signal locally for all circuits.

12. Verify that a ground condition on a signaling line circuits activates a trouble signal locally for all circuits.

13. Verify that a ground condition on a notification appliance circuit activates a trouble signal locally for all circuits.

3.06 DEMOLITION

A. See section 27 05 00, for requirements

3.07 FINAL DOCUMENT SUBMITTALS

A. See section 27 00 00, for additional requirements

B. Submit completed NFPA certification forms as found in NFPA 72. Forms shall be submitted in typewritten format.

C. Provide District an electronic copy of final test results.

D. Contractor “red-line as-built” drawings shall also include the following: The drawings shall depict, at a minimum, the following conditions:

1. The device exact installed location.

2. Device updated labeling ID(s), which shall match the physical label at the device.

3. Revised risers to match record set point to point installation and

4. Updated battery calculation with quantity of device changes.

5. New pathways, conduit, ground boxes, junction boxes, raceway, power-poles and floor-monuments.

6. Any other new conditions.

E. The Contractor shall submit “red-line as-built” drawings as indicated on project schedule.

F. Warranty:

1. Refer to Division 01 Warranty section.

2. After the satisfactory completion letter has been received, a continuous and fault free thirty (30) day “burn-in” period shall begin. Any fault shall reset the “burn-in” period to zero (0). Warranty shall commence at day 31 of a successful and continuous “burn-in” period.

APPENDIX A – Pre-Approved Materials

DESCRIPTION	MFG	PART NUMBER
Fire Alarm Control Panel	**Fire-Lite**	**ES-1000X 954-PT**
Voice EVAC Control Panel	**Fire-Lite**	**ECC-50/100**
Remote Fire Annunciator	**Fire-Lite**	**LCD-80F**
Smoke Detector	**Fire-Lite**	**SD365**
Heat Detector (Rate of Rise)	**Fire-Lite**	**H365R**
Heat Detector (Non-addressable)	**System Sensor**	**5602**
CO Detector	**Fire-Lite**	**SD355CO**
Pull Station	**Fire-Lite**	**BG-12LX**
Monitor Module (Single)	**Fire-Lite**	**MMF-300**
Monitor Module (Dual)	**Fire-Lite**	**MDF-300**
Monitor Module (Mini)	**Fire-Lite**	**MMF-301**
DACT	**Fire-Lite**	**DACT-UD2**
Remote Amplifier	**Fire-Lite**	**ECC-50DA**
Remote Microphone	**Fire-Lite**	**ECC-RM**
Booster Power Supply	**Fire-Lite**	**FCPS-24FS6**
Horn/Strobe (Wall)	**System Sensor**	**P2RL**
Horn/Strobe (Ceiling)	**System Sensor**	**PC2RL**
Horn (Outdoor)	**System Sensor**	**HRK**
Speaker/Strobe (Wall)	**System Sensor**	**SPSRL**
Speaker/Strobe (Ceiling)	**System Sensor**	**SPSCRL**
Speaker (Outdoor)	**System Sensor**	**SPRK**
Duct Smoke Detector	**System Sensor**	**D4120**
Test Switch	**System Sensor**	**RTS-151-KEY**
Terminal/Barrier Strip	**Ideal Industries**	**89-608**
Dry Contact Input Relay	**Functional Devices, Inc.**	**RIB01BDC**
Fire Alarm Control Panel	**Notifier**	**NFS2-3030**
Voice EVAC Control Panel	**Notifier**	**NFC-50/100**
Smoke Detector	**Notifier**	**FSP-951**

Heat Detector (Rate of Rise)	**Notifier**	**FST-951**
CO Detector	**Notifier**	**FSCO-951**
Smoke/CO Detector	**Notifier**	**FCO-951**
Pull Station	**Notifier**	**NBG-12LX**
Monitor Module	**Notifier**	**FMM-1**
Monitor Module (Mini)	**Notifier**	**FMM-101**
Control Relay	**Notifier**	**FRM-1**
Isolator Module	**Notifier**	**ISO-X**
Remote Power Supply	**Notifier**	**PSE-6**
Heat Detector (194°/Rate of rise, Conventional)	**System Sensor**	**5602**
Heat Detector (194°/Rate of rise, Conventional) mounting plate	**Potter/Thermotech**	**302-194, AP-P**
Heat Detector (135°/Rate of rise, Conventional Threaded)	**Potter/Thermotech**	**302ET-135**
Universal Dual Path Communicator	**Bosch**	**B465**
Cellular Dialer	**Telguard**	**TG-7FM**

SECTION 31 13 16

TREE PROTECTION

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Tree protection complete as shown and as specified.

B. Related Sections:
1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 02 41 00 – Site Demolition.
3. Section 32 80 00 – Irrigation.
4. Section 32 90 00 – Landscaping

1.02 SUBMITTALS

A. Contractor shall submit Tree Protection Area plan to Architect outlining all trees and plants listed by number to be protected and their groupings. All trees and plants shall be grouped in their own Fenced Tree Protection Areas as shown in Drawings.

B. Contractor shall submit to Landscape Architect in writing a schedule including any and all activity inside Fenced Tree Protection Areas. This schedule to include but not limited to the dates fences are initially installed, altered and dates of fence replacement. Intent of these provisions is that the Tree Protection Zone (TPZ) are fenced for the entire duration with only exceptions of short intervals or specifically defined construction activity needs. Revise schedule as directed by Architect.

C. Provide a Mediation Plan to keep existing trees and planting irrigated during construction.

1.03 WARRANTY

A. Guarantee all workmanship and materials hereunder against defective workmanship and materials, including damage by leaks and settlement of irrigation trenches, for the duration specified in Division 01 of these Specifications. (The Contractor is not responsible for vandalism or theft after date of final acceptance.)

PART 2- PRODUCTS

2.01 MATERIALS

A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.

B. Trunk Protection constructed of:

1. 20-foot long 2x6 wood boards or length needed to protect the trunk if tree trunk is shorter than 20'.
2. Metal wire. Gauge strong enough to tie the boards around the trunk of the tree.

C. Tree Protection Zone Fencing:

1. 4-foot-tall snow fencing or 6-foot-tall metal chain link construction fencing per the discretion of the Landscape Architect or District Representative.

D. Bark Mulch: Untreated, shredded cedar.

PART 3 – EXECUTION

3.01 PREPARATION

A. Maintain pre-existing moisture levels.

B. Maintain areas inside the fenced tree protection area including lawn mowing, leaf removal, operation and repair of irrigation.

C. Protect root systems from flooding, erosion, excessive watering and drying resulting from dewatering or other operations:

D. Prohibitions - DO NOT:

1. Allow run off or spillage of damaging materials in vicinity of root systems,
2. Rinse tools or equipment under trees,
3. Store materials, stockpile soil, park or drive vehicles within drip lines or in areas with plants,
4. Cut, break skin or bark, bruise roots or branches,
5. Allow fires under and adjacent trees and plants,
6. Discharge exhaust under foliage,
7. Secure cable, chain, or rope to trees,
8. Change grade within drip line of trees without Landscape Architect's approval,
9. Lime shall not be used.

3.02 INSTALLATION

A. Tree Trunk Protection

1. Conform to requirements for trees and plants to be retained, per 3.01, above.
2. Install boards vertically around tree and bind together with wire to protect the bark 360 degrees around the entire tree prior to start of any demolition and construction. Boards are not to dig into bark.
3. Major scaffold limbs may require plastic fencing or straw waddles to be wrapped around them to protect them.

B. Tree Dripline Protection

1. The Tree Protection Zone (TPZ) is a restricted area around the base of the tree with a radius of one foot (1') for every inch of tree trunk diameter or ten feet, which is greater, enclosed by tree protection zone fencing.
2. Signage designating the protection zone and penalties for violations shall be secured in prominent location on each protection fence.

C. Requirements for Trees to be Protected

1. Duration: Tree protection shall be erected before demolition, grading, or any construction begins and remain in place until final inspection of the project.
2. Conform to requirements for trees and plants to be retained, per 3.01, above.
3. Architect shall give final review of Tree Protection before construction to begin. Revise schedule as directed by Architect.
4. Vehicle movement within the TPZ will only be allowed for construction equipment.
   a. Within dripline, apply 10-inch layer of mulch over geotextile fabric.

5. Perform trenching operations within the TPZ of the tree so that:
   a. Digging shall be by hand using narrow trenching shovel,
   b. No roots larger than 2" diameter are cut and utilities are routed around or below them,
   c. Roots smaller than 2" diameter are cut with sharp tools, saws, loppers- not torn, chopped or broken.

6. Where roots are exposed:
   a. Do not allow the roots to dry out,
   b. On the same day the excavation is made, provide temporary backfill to original grade at tree roots,
   c. Or cover roots with 4 layers of wet untreated burlap, made wet each day, including weekends.

7. Roots larger than 3" in diameter are not to be cut without review and approval of Arborist.

3.03 REPAIR/RESTORATION:

A. It shall be the responsibility of Contractor to repair or replace any damaged trees.

B. Repair trees damaged by operations:

1. within 24 hours of damage,
2. to satisfaction of Landscape Architect,
3. to ISA Pruning Standards.

C. Replace repaired trees where repair has not restored them to health or aesthetics:

1. within 6 months of request to replace,
2. to the satisfaction of Landscape Architect,
3. with replacement plants of a size and variety matching those that were removed

D. Replaced trees and plants shall be the responsibility of Contractor to maintain in good health and aesthetics for the duration of the project from installation.

1. Contractor shall submit to Landscape Architect comprehensive maintenance plan for replacement tree, including but not limited to provisions for irrigation system independent of existing system.

E. Where suitable replacement of trees and plants are not available:

1. Contractor shall provide affidavits to Landscape Architect that they are not available.
2. Contractor shall provide compensation to the State at the following rates:
   a. $2000 for each caliper inch of any tree or plants removed under 12 inches.
   b. $4000 for each caliper inch of any tree or plants removed 12 inches or more.
   c. Caliper of trees and plants measured at 6 inches above grade.
   d. Caliper defined here as thickness of diameter, measured in inches.

F. Soil Contamination:

1. Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.

END OF SECTION