

TECHNICAL SPECIFICATIONS
PLAY STRUCTURE AND SHADE
STRUCTURE INSTALLATION

AT

FDR ELEMENTARY SCHOOL

3533 Marine Avenue
Lawndale, CA 90260

LAWNDALE ELEMENTARY SCHOOL DISTRICT

4161 West 147th Street
Lawndale, CA 90260
Tel. (310) 973-1300



WWA Project No. 24018.01

July 3, 2025

Contact: Ricardo Bermudez, Project Manager
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Tel. (714) 508-1780, ext. 370

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ARCHITECT

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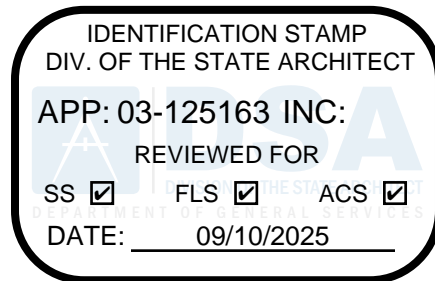


TABLE OF CONTENTS

DIVISION 01 GENERAL REQUIREMENTS

01 1100	Summary of Work
01 2610	Construction Document Modification Procedures
01 2976	Progress Payment Procedures
01 3113	Project Coordination
01 3119	Project Meetings
01 3300	Submittal Procedures
01 4100	Regulatory Requirements
01 4200	References
01 4500	Quality Control
01 5000	Temporary Facilities and Controls
01 5713	Temporary Erosion and Sediment Controls
01 6000	Product Requirements
	Substitution Request Form
01 7123	Field Engineering
01 7329	Cutting and Patching
01 7419	Construction Waste Management and Disposal
01 7423	Cleaning
01 7700	Closeout Procedures
01 7839	Project Record Documents

DIVISION 02 EXISTING CONDITIONS

02 4113	Selective Site Demolition
02 4120	Selective Interior Demolition

DIVISION 05 METALS

05 5000	Metal Fabrications
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DIVISION 06 WOOD, PLASTICS, AND COMPOSITES

06 1053	Miscellaneous Carpentry
---------	-------------------------

DIVISION 07 THERMAL AND MOISTURE PROTECTION

07 9200	Joint Sealants
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DIVISION 08 OPENINGS

08 1113	Hollow Metal Doors and Frames
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DIVISION 09 FINISHES

09 2900	Gypsum Board
09 3000	Tile
09 9100	Painting

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

DIVISION 10 SPECIALTIES

- 10 1400 Signage
- 10 2813 Toilet Accessories

DIVISION 11 EQUIPMENT

- 11 6818 Installation of Play Structures

DIVISION 31 EARTHWORK

- 31 0000 Earthwork
- 31 1000 Site Clearing

DIVISION 32 EXTERIOR IMPROVEMENTS

- 32 0117 Asphalt Paving Repair
- 32 1100 Base Course
- 32 1313 Concrete Paving
- 32 1723 Pavement Markings
- 32 1726 Detectable Warning Surfaces
- 32 1818 Playground Surfacing Tiles
- 32 8400 Planting Irrigation
- 32 9343 Tree Planting

DIVISION 33 UTILITIES

- 33 4200 Stormwater Conveyance

END OF TABLE OF CONTENTS

SECTION 01 1100

SUMMARY OF WORK

PART 1 GENERAL

1.01 PROJECT DESCRIPTION

- A. Project consists of replacing existing playground structures and equipment and installation of new play structure and shade structure at FDR Elementary School, Lawndale, CA, for Lawndale Elementary School District, Lawndale, California, as shown on Contract Documents prepared by Westberg+White, Inc., Architects
- B. Work includes:
 - 1. Selective Site Demolition Work Consisting of removal of:
 - a. Portion of concrete sidewalk on path of travel.
 - b. Portion of asphalt paving at designated parking spaces.
 - c. Scarify and removal of existing trees and turf where new play structure and shade structure will be located.
 - 2. Selective Interior Demolition Work Consisting of:
 - a. Partial demolition in existing toilet rooms as indicated on Drawings.
 - 3. New Construction Consisting of:
 - a. Installation of new Play Structure per Drawing layout.
 - b. Installation of new Shade Structure per Drawings.
 - c. Modifications to existing toilet rooms as indicated on Drawings.
 - 4. Site Improvement Work Consisting of:
 - a. New hardscape, including, but not necessarily limited to:
 - 1) New asphalt and concrete paving for parking areas, walkways, and related path of travel.
 - a) Including pavement markings and detectable warning surfaces.
 - 2) New playground surfacing tiles.
 - b. Revisions to path of travel and parking spaces:
 - 1) Including pavement markings as required.

1.02 PROCUREMENT AND CONTRACTING DOCUMENTS

- A. Use Division 00 Procurement and Contracting Requirements provided by Lawndale Elementary School District for installation of Play Structure and Shade Structure at FDR Elementary School.

1.03 RELATED DOCUMENTS

- A. Refer to District's Division 00 Documents, including General Conditions, and other Division 01 Sections, for additional requirements.
- B. Comply with requirements of these specifications and District's Division 00 documents.
 - 1. Where differences may occur between specifications and District 00 documents, requirements of District's 00 documents govern, unless otherwise directed.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

2. Changes to approved documents will be made by addenda or change order approved by Owner/Architect.
- C. Contract Documents are complementary and what is required by one is as binding as when required by all.
 1. Report errors, inconsistencies, or omissions discovered by Contractor promptly to Owner/Architect as request for information.
- D. Related Sections:
 1. Section 01 4100: Regulatory Requirements; current Code edition.
 2. Section 02 4113: Selective Site Demolition
 3. Section 02 4120: Selective Interior Demolition.

1.04 CONSTRUCTION REQUIREMENTS

- A. Construct Work conforming to requirements of California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2.
 1. Refer to Section 01 4100 for current Code edition.
 2. Refer to Section 01 4200 for additional references.

1.05 CONTRACTS

- A. Construct Work under single fixed-price contract.

1.06 WORK SEQUENCE

- A. General:
 1. Conform to construction schedule as specified.
 2. Construction Time:
 - a. Starts as of date specified in initial "Notice to Proceed" from Architect to Contractor and ends with date of acceptance of Work by Owner.
- B. Construction Schedule:
 1. Work will be conducted in single phase and provide least possible interference with activities of Owner's personnel and to permit orderly transfer of personnel and equipment to new facilities.
- C. Liquidated Damages:
 1. Liquidated damages will be assessed under conditions provided in Agreement.

1.07 CONTRACTOR'S USE OF PREMISES

- A. General:
 1. During construction period, limit use of premises to immediate area required for construction operations.
 2. Use of premises is also limited by Owner's right to perform construction operations with its own forces or to employ separate contractors on portions of Project.
- B. Limit use of premises for Work and for storage as directed, to allow for:
 1. Work by other Contractors.
 2. Owner occupancy.
 3. Use by Public.

- C. Coordinate use of premises under direction of Architect and Owner.
- D. Assume full responsibility for protection and safekeeping of products under this contract, stored on Project Site.
- E. Move stored products under Contractor's control, which interfere with operations of Owner or separate contractor.
- F. Obtain and pay for use of additional storage or work areas needed for operations.

1.08 WORK DURING SCHOOL SESSIONS

- A. Work under this contract will be executed in part during regular sessions of School.
 - 1. Cooperate with School authorities in every way to minimize disturbance.
- B. In entrance and exit of workers, and in bringing in, storing, and removal of equipment, cooperate with those in authority and prevent interference with functioning of School.
 - 1. Observe rules and regulations in force and avoid unnecessary dust, mud, or accumulated debris, or undue interference with convenience, sanitation or routine of departmental activities.
- C. In connecting new utilities to existing, and similar operations, time and coordinate such operations so that there will be no interference with School activities.
 - 1.

1.09 HAZARDOUS MATERIALS

- A. Asbestos or Hazardous Waste:
 - 1. It is understood and agreed that this contract does not contemplate handling of asbestos or other hazardous waste material.
 - 2. Should asbestos or other hazardous waste material be encountered, notify Owner immediately and await direction.
 - 3. Do not disturb, handle or attempt to remove hazardous waste materials.

PART 2 PRODUCTS *(Not Applicable)*

PART 3 EXECUTION *(Not Applicable)*

END OF SECTION 01 1100

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 01 2610

CONSTRUCTION DOCUMENT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements for handling and processing Construction Document Modifications to Contract.

1.02 MINOR CHANGES IN WORK

- A. Supplemental instructions authorizing minor changes in Work, not involving adjustment to Contract Sum or Contract Time, will be issued by Architect on *AIA form G710 - Architect's Supplemental Instructions*.

1.03 CONSTRUCTION CHANGE DOCUMENT APPROVAL REQUESTS

- A. Construction Change Documents will not be allowed without Division of the State Architect (DSA) approval.
- B. Owner-Initiated Change Requests:
 - 1. Proposed changes in Work that will require adjustment to Contract Sum or Contract Time will be issued by Architect, with detailed description of proposed change and supplemental or revised Drawings and Specifications, when necessary.
 - 2. Change requests issued by Architect are for information only.
 - a. Do not consider them an instruction either to stop Work in progress, or to execute proposed change.
 - 3. Unless otherwise indicated in change request, within ten days of receipt of change request, submit to Architect for Owner's review, estimate of cost necessary to execute proposed change.
 - a. When no estimate of cost is submitted within 10 days it will be assumed to be "no cost change".
 - b. Include list of quantities of products to be purchased and unit costs, along with total amount of purchases to be made.
 - c. Provide breakdown of labor cost involved with the proposed change.
 - 1) Where requested, furnish survey data to substantiate quantities.
 - d. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - e. Include statement indicating effect proposed change in Work will have on Contract Time.
- C. Contractor-Initiated Change Requests:
 - 1. When latent or other unforeseen conditions require modifications to Contract, Contractor may propose changes by submitting request for change to Architect.
 - a. Notify Owner within ten days of occurrence leading to such request or request will be denied and Contractor will not be entitled to additional compensation.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

2. Include statement outlining reasons for change and effect of change on Work.
 - a. Provide complete description of proposed change.
 - b. Indicate effect of the proposed change on Contract Sum and Contract Time.
 3. Include list of quantities of products to be purchased and unit costs along with total amount of purchases to be made. .
 - a. Provide breakdown of labor cost involved with proposed change.
 - b. Where requested, furnish survey data to substantiate quantities.
 4. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 5. Comply with requirements in Section 01 6000, when proposed change in Work requires substitution of one product or system for product or system specified.
- D. Construction Change Document:
1. *DSA Form 140 – Application for Approval of Construction Change Document – CCD Category A.*
 2. Form will be prepared by Architect for approval by DSA.
 3. Form must be signed by each of following:
 - a. A/E of Record.
 - b. Structural Engineer, when applicable.
 - c. Delegated professional engineer, when applicable.
 - d. DSA

1.04 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive:
1. When Owner and Contractor are not in total agreement on terms of Change Order Proposal Request, Architect may issue Construction Change Directive on *AIA Form G714*, instructing Contractor to proceed with change in Work, for subsequent inclusion in Contract.
 2. Construction Change Directive will contain complete Construction Change Document and designate method to be followed to determine change in Contract Sum or Contract Time.
- B. Documentation:
1. Maintain detailed records on time and material basis of work required by Construction Change Directive.
 2. After completion of change, submit itemized account and supporting data necessary to substantiate cost and time adjustments to Contract.

1.05 CONTRACT CHANGE ORDER PROCEDURES

- A. Upon DSA approval of Construction Change Document DSA Form 140, Architect will issue Construction Change Documents for signatures of Owner and Contractor on proper approved form, as provided in General Conditions of the Contract.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 2610

SECTION 01 2976

PROGRESS PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements governing Contractor's applications for payment.

- B. Related Sections:
 - 1. Section 01 2610: Construction Document Modification Procedures
 - 2. Section 01 7700: Closeout Procedures
 - 3. Section 01 7839: Project Record Documents

- C. Related Requirements:
 - 1. Refer to District's Division 00 Documents, including General Conditions, for requirements related to Contractor's Construction Schedule, Submittal Schedule, and Progress Payments Procedures.

1.02 SCHEDULE OF VALUES

- A. Coordinate preparation of Schedule of Values with preparation of Contractor's construction schedule.
 - 1. Correlate line items in Schedule of Values with other required administrative schedules and forms, including:
 - a. Contractor's Construction Schedule.
 - b. Application for Payment form.
 - c. List of Subcontractors.
 - d. Schedule of Alternates.
 - e. List of products.
 - f. List of principal suppliers and fabricators.
 - g. Schedule of Submittals.
 - 2. Submit Schedule of Values to Architect at earliest feasible date, but in no case later than fourteen days before date scheduled for submittal of initial application for payment.
 - 3. Sub-Schedules: Where Work is separated into phases that require separately phased payments, provide sub-schedules showing values correlated with each phase of payment.

- B. Format and Content:
 - 1. Include following project identification on Schedule of Values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

2. Arrange Schedule of Values in tabular form with separate columns to indicate following for each item listed:
 - a. Generic name.
 - b. Related specification section.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that have affected value.
 - g. Dollar value.
 - h. Percentage of Contract sum to nearest one-hundredth percent, adjusted to total 100 percent.
3. Provide breakdown of Contract Sum in sufficient detail to facilitate continued evaluation of applications for payment and progress reports.
 - a. Break principal subcontract amounts down into several line items.
4. Round amounts off to nearest whole dollar, with total equal to Contract Sum.
5. For each part of Work where application for payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of Work.
6. Margins of Cost:
 - a. Show line items for indirect costs, and margins on actual costs, only to extent that such items will be listed individually in applications for payment.
 - b. Complete each item in Schedule of Values and applications for payment including its total cost and proportionate share of general overhead and profit margin.
 - c. At Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in Schedule of Values or distributed as general overhead expense.
7. Schedule Updating:
 - a. Update and resubmit Schedule of Values when Change Orders or Construction Change Directives result in change in Contract Sum.
 - b. Submit along with updated construction schedule prior to monthly progress payment submittal

1.03 APPLICATIONS FOR PAYMENT

- A. Ensure that each application for payment is consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial application for payment, application for payment at time of Substantial Completion, and final application for payment involve additional requirements.
- B. Payment Application Times:
 1. Date for each progress payment is 5th day of each month,
 2. Period of construction Work covered by each application for payment is period ending fifteen days prior to date for each progress payment and starting day following end of preceding period.

- C. Payment Application Forms:
1. Use *AIA Document G702 –Application and Certification For Payment* as form for application for payment or approved equal.
- D. Application Preparation:
1. Complete every entry on form, including notarization and execution by person authorized to sign legal documents on behalf of Owner.
 - a. Incomplete applications will be returned without action.
 2. Ensure entries match data on Schedule of Values and Contractor's construction schedule.
 - a. Use updated schedules when revisions have been made.
 3. Include amounts of approved Change Orders issued prior to last day of construction period covered by application.
- E. Transmittal:
1. Submit five executed copies of each application for payment to Architect by means ensuring receipt within twenty-four hours.
 - a. Transmit one completed copy, including waivers of lien and similar attachments, when required.
 - b. Transmit each copy with transmittal form listing attachments, and recording appropriate information related to application in manner acceptable to Architect.
- F. Waivers of Mechanics Lien:
1. When requested by Architect or Owner, with each application for payment, submit waivers of mechanics lien from every entity who may lawfully be entitled to file mechanics lien arising out of Contract, and related to Work covered by payment.
- G. Initial Application for Payment:
1. Administrative actions and submittals that must precede or coincide with submittal of first application for payment include following:
 - a. List of subcontractors.
 - b. List of principal suppliers and fabricators.
 - c. Schedule of Values.
 - d. Contractor's Construction Schedule (preliminary if not final).
 - e. Submittal Schedule (preliminary if not final).
 - f. Certificates of insurance and insurance policies.
 - g. Performance and Payment Bonds
- H. Application for Payment at Substantial Completion:
1. Following issuance of Certificate of Substantial Completion, submit application for payment.
 2. Submit Application reflecting Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of Work.
- I. Administrative actions and submittals that precede or coincide with application include:
1. Occupancy permits and similar approvals.
 2. Warranties/guarantees and maintenance agreements.
 3. Test/adjust/balance records.
 4. Maintenance instructions.
 5. Meter readings.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

6. Start-up performance reports.
 7. Changeover information related to Owner's occupancy, use, operation and maintenance.
 8. Final cleaning.
 9. Application for reduction of retainage, and consent of surety.
 10. Advice on shifting insurance coverage.
 11. Record Drawings and Specifications.
 12. Final progress photographs.
 13. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.
- J. Final Payment Application:
1. Administrative actions and submittals that must precede or coincide with submittal of final payment application for payment include following:
 - a. Completion of project closeout requirements.
 - b. Completion of items specified for completion after Substantial Completion.
 - c. Assurance that unsettled claims will be settled.
 - d. Assurance that Work not complete and accepted will be completed without undue delay.
 - e. Transmittal of required project construction records to Owner.
 - f. Proof that taxes, fees and similar obligations have been paid.
 - g. Removal of temporary facilities, controls, and services.
 - h. Removal of surplus materials, rubbish and similar elements.
 - i. Change of door locks to Owner's access.

PART 2 PRODUCTS *(Not Applicable)*

PART 3 EXECUTION *(Not Applicable)*

END OF SECTION 01 2976

SECTION 01 3113

PROJECT COORDINATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
 - a. Coordination.
 - b. Administrative and supervisory personnel.
 - c. General installation provisions.
 - d. Cleaning and protection.
- B. Related Sections:
 - 1. Section 01 3300: Submittal Procedures; product and material submittals.
 - 2. Section 01 7423: Cleaning; general project cleaning
- C. Related Requirements:
 - 1. Refer to District's Division 00 Documents, including General Conditions, for requirements related to Contractor's Construction Schedule and Submittal Schedule.

1.02 COORDINATION

- A. Coordination:
 - 1. Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of Work.
- B. Coordinate construction operations included under different Sections of Specifications that are dependent upon each other for proper installation, connection, and operation.
 - 1. Where installation of one part of Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in sequence required to obtain best results.
 - 2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination.
 - 1. Include such items as required notices, reports, and attendance at meetings.
 - 2. Prepare similar memoranda for Owner and separate Contractors where coordination of their Work is required.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- D. Administrative Procedures:
 - 1. Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of Work.
 - 2. Such administrative activities include, but are not necessarily limited to, following:
 - a. Preparation of schedules.
 - b. Installation and removal of temporary facilities.
 - c. Delivery and processing of submittals.
 - d. Progress meetings.
 - e. Project Close-out activities.
- E. Conservation:
 - 1. Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and materials.
 - 2. Salvage materials and equipment involved in performance of, but not actually incorporated in, Work.
 - 3. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

1.03 SUBMITTALS

- A. Staff Names:
 - 1. Within fifteen days of Notice to Proceed, submit list of Contractor's principal staff assignments, including Superintendent and other personnel in attendance at Project Site
 - 2. Identify individuals, their duties and responsibilities
 - a. List their addresses and telephone numbers.
 - 3. Post copies of list in Project meeting room, temporary field office and each temporary telephone.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions:
 - 1. Require installer of each major component to inspect both substrate and conditions under which Work is to be performed.
 - 2. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions:
 - 1. Comply with manufacturer's installation instructions and recommendations, to extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation.
 - 1. Reject damaged and defective items.

- D. Provide attachment and connection devices and methods necessary for securing Work.
 - 1. Secure Work true to line and level.
 - 2. Allow for expansion and building movement.
- E. Visual Effects:
 - 1. Provide uniform joint widths in exposed Work.
 - 2. Arrange joints in exposed Work to obtain best visual effect.
 - 3. Refer questionable choices to Architect for final decision.
- F. Recheck measurements and dimensions before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure best possible results.
 - 1. Isolate each part of completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize necessity of uncovering completed construction for that purpose.
- I. Mounting Heights:
 - 1. Where mounting heights are not indicated, install individual components at standard mounting heights recognized within industry for particular application indicated.
 - 2. Comply with requirements of Chapter 11B of CBC for accessible mounting heights of toilet accessories and like items.
 - 3. Refer questionable mounting height decisions to Architect for final decision.

3.02 CLEANING AND PROTECTION

- A. Comply with requirements of Section 01 7423.
- B. During handling and installation, clean and protect construction in progress and adjoining materials in place.
 - 1. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- C. Clean and maintain completed construction as frequently as necessary through remainder of construction period.
 - 1. Adjust and lubricate operable components to ensure operability without damaging effects.
- D. Limiting Exposures:
 - 1. Supervise construction activities to ensure that no part of construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

END OF SECTION 01 3113

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 01 3119
PROJECT MEETINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements for project meetings including but not limited to:
 - a. Pre-Construction Conference
 - b. Progress Meetings
 - c. Scheduling Conference

- B. Related Sections:
 - 1. Section 01 3113: Project Coordination
 - 2. Section 01 3300: Submittals

- C. Related Requirements:
 - 1. Refer to various Sections for pre-construction and pre-installation meeting requirements
 - 2. Refer to District's Division 00 Documents, including General Conditions, for requirements related to Contractor's Construction Schedule.
 - 3. Requirements for Contractor's Construction Schedule are included in Section 01 3300.

1.02 PRE-CONSTRUCTION CONFERENCE

- A. Schedule pre-construction conference and organizational meeting at Project Site or other convenient location no later than 15 days after execution of Agreement and prior to commencement of construction activities.
 - 1. Conduct meeting to review responsibilities and personnel assignments.

- B. Attendees:
 - 1. Owner, Architect and their consultants.
 - 2. Contractor and his superintendent.
 - 3. Major subcontractors, manufacturers, suppliers.
 - 4. Other concerned parties.
 - 5. Persons representing each party in attendance must be familiar with and authorized to conclude matters relating to Work.

- C. Agenda:
 - 1. Discuss items of significance that could affect progress including such topics as:
 - a. Tentative construction schedule.
 - b. Critical Work sequencing.
 - c. Designation of responsible personnel.
 - d. Procedures for processing field decisions and Change Orders.
 - e. Procedures for processing Applications for Payment.
 - f. Procedures for processing Requests for Information (RFI).
 - g. Distribution of Contract Documents.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- h. Submittal of Shop Drawings, Product Data and Samples.
- i. Preparation of Record Documents.
- j. Access to Project Site and use of premises.
- k. Office, Work and storage areas.
- l. Equipment deliveries and priorities.
- m. Safety procedures.
- n. First aid.
- o. Security.
- p. Working hours.

1.03 PROGRESS MEETINGS

- A. Conduct weekly progress meetings at Project Site.
 - 1. Coordinate dates of meetings with preparation of payment request.

- B. Attendees:
 - 1. Representatives of
 - a. Owner and Architect,
 - b. Representatives of each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities.
 - c. Persons representing each party in attendance at these meetings must be familiar with and authorized to conclude matters relating to progress.

- C. Agenda:
 - 1. Review and correct or approve minutes of previous progress meeting.
 - 2. Review other items of significance that could affect progress.
 - 3. Include topics for discussion as appropriate to current status of Project.
 - 4. Contractor's Construction Schedule:
 - a. Review progress since last meeting.
 - b. Determine where each activity is in relation to Contractor's Construction Schedule, whether on time or ahead or behind schedule.
 - c. Determine how construction behind schedule will be expedited
 - 1) Secure commitments from parties involved to do so.
 - d. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within Contract Time.
 - 5. Review present and future needs of each entity present, including such items as:
 - a. Interface requirements.
 - b. Time.
 - c. Sequences
 - d. Coordination of Work.
 - e. Deliveries.
 - f. Off-site fabrication problems.
 - g. Access.
 - h. Site utilization.
 - i. Temporary facilities and services.
 - j. Hours of Work.
 - k. Hazards and risks.
 - l. Housekeeping.
 - m. Quality and Work standards.
 - n. Construction progress
 - o. Progress Schedule and Submittals.

PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT

- p. Change Orders.
 - q. Documentation of information for payment requests.
- D. Meeting Records:
- 1. Recording of minutes of each meeting will be by Contractor.
 - a. Furnish copies within reasonable time to Owner, Architect, and other attendees.
 - b. Unless written objections to contents of meeting minutes are received by Contractor within five days of distribution of meeting minutes, it is understood and agreed upon that minutes are true and complete record of meeting.
 - c. Schedule Updating:
 - 1) Revise construction schedule after each progress meeting where revisions to schedule have been made or recognized.
 - 2) Issue revised schedule within seven calendar days of meeting.

PART 2 PRODUCTS *(Not Applicable)*

PART 3 EXECUTION *(Not Applicable)*

END OF SECTION 01 3119

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 01 3300

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Procedural requirements for non-administrative submittals for work-related submittals required for performance of Work and by Contract Documents, including, but not necessarily limited to:
 - a. Submittal Schedule.
 - b. Product Data.
 - c. Shop Drawings.
 - d. Samples
 - e. Verified Reports
 - f. Deferred Approvals
- B. Related Sections:
1. Section 01 3113: Project Coordination
 2. Section 01 4100: Regulatory Requirements; submittals to regulatory agencies.
 3. Section 01 4200: References; submittals to regulatory agencies.
 4. Section 01 4500: Quality Control: inspection and testing submittals
 5. Section 01 6000: Products Requirements; request for substitution submittals.
- C. Related Requirements:
1. Refer to District's Division 00 Documents, including General Conditions, and other Division 01 Sections, for specifications for administrative submittals and additional requirements.
 - a. Administrative Submittals include, but are not necessarily limited to:
 - 1) Permits.
 - 2) Applications for Payment.
 - 3) Performance and Payment Bonds.
 - 4) Insurance Certificates.
 - 5) Inspection and Test Reports.
 - 6) Schedule of Values.
 - 7) Progress Schedule.
 - 8) Listing or designation of subcontractors.
 - 9) Record Drawings.
 2. Refer to Division 02 through 33 Sections where more specific Submittal Requirements are indicated
- D. Substitutions:
1. Contractor's submittal and Architect's acceptance of Product Data, Shop Drawings, or Samples that relate to construction activities not complying with Contract Documents does not constitute acceptable or valid request for substitution, nor does it constitute approval.
 2. Product Data, Shop Drawing and Sample Submittals containing substitutions for specified items will be rejected and returned as not in compliance with Contract Documents.

3. Refer to Section 01 6000 for required procedures for submitting substitution requests.

1.02 SUBMITTAL PROCEDURES AND REQUIREMENTS

- A. Coordination:
 1. Coordinate preparation and processing of submittals with performance of construction activities.
 2. Designate in Progress Schedule, or in separate coordinated schedule, dates for submission and dates reviewed shop drawings, product data and samples will be needed for each product.
 - a. Identify items requiring long lead times.
 - 1) Make submittals for such items as soon as possible, but not later than fifteen days after Notice of Award of Contract.
- B. Timing of Submittals:
 1. Make submittals promptly in accordance with approved schedule, sufficiently in advance of performance of related construction activities, and in such sequence as to not cause delay in Work or in Work of other contractors.
 2. Schedule submissions at least 21 working days before dates reviewed submittals will be needed.
- C. Number of Submittals Required:
 1. Number stated in each specification section, or as follows:
 - a. Product Data and Shop Drawings:
 - 1) One electronic copy as specified under "Electronic Submittals".
 - b. Samples:
 - 1) Number stated in each specification section or, when not stated, minimum of four.
 - c. Warranties, Maintenance Agreements, Industry Standards, and Operation/Maintenance Manuals:
 - 1) Two copies.
- D. Submittal Preparation:
 1. Place permanent label or title block on each submittal for identification.
 2. Indicate name of entity that prepared each submittal on label or title block.
 3. Include following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Submittal reference number assigned by Contractor; this number should not be specification section number.
 - d. Specification section number to which submittal applies.
 - 1) Do not reference drawing/detail numbers unless accompanied by specification section number.
 4. Accompany submittals with transmittal form containing:
 - a. Date.
 - b. Project title and number.
 - c. Name and address of:
 - 1) Architect.
 - 2) Contractor.
 - 3) Subcontractor.
 - 4) Supplier

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- 5) Manufacturer.
 - 6) Separate detailer, when pertinent.
 - d. Number of each shop drawing, product data and sample submitted.
 - e. Notification of deviations from Contract Documents.
 - f. Other pertinent data.
 - 1) Interactive Submittal Transmittal Form will be provided to Contractor at Pre-Construction Meeting.
- E. Include following on Submittals:
- 1. Data and revision dates:
 - 2. Project title and number.
 - 3. Identification of product or material.
 - 4. Relation to adjacent structure or materials.
 - 5. Field dimensions, clearly identified as such.
 - 6. Specification section number.
 - 7. Applicable standards, such as ASTM number or Federal Specification.
 - 8. Blank space, 8 inches x 3 inches, for Contractor and Architect stamps.
 - 9. Identification of deviations from Contract Documents.
 - 10. Contractor's stamp, initialed or signed, certifying review of submittal, verification of field measurements, and compliance with Contract Documents.
 - a. Submittals without Contractor's stamp and signature will be returned by Architect without review.
- F. Processing:
- 1. Allow sufficient review time so that installation will not be delayed as result of time required to process submittals, including time for resubmittals.
 - 2. Allow minimum of 21 days from date of receipt of complete submittal for Architect's initial review and return of submittals.
 - 3. Allow additional time if processing must be delayed to permit coordination with subsequent submittals.
 - 4. Architect reserves right to withhold action on submittal requiring coordination with other submittals until related submittals are received.
 - 5. Architect will promptly advise Contractor when submittal being processed must be delayed for coordination.
 - 6. No extension of Contract Time will be authorized because of failure to transmit submittals to Architect sufficiently in advance of Work to permit processing.
- G. Electronic Submittals:
- 1. Make electronic submittals consisting of one color PDF of each document, Product Data Sheet, or Shop Drawing.
 - 2. Should full size hard copies of Submittals be required by District, Contractor, or Consultant, Architect will provide one marked-up color copy of PDF to Owner, Contractor, or Consultant for their use in printing additional copies.
 - 3. Architect will review and return marked-up PDFs to Contractor.
 - 4. Mark-up one copy of each PDF and maintain as "Record Document".
- H. Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS):
- 1. Do not include MSDS/SDS in submittals to Architect.
 - a. MSDS/SDS sheets will not be reviewed by Architect and will not be returned.
 - 2. Include MSDS/SDS sheets in submittals to Contractor only.

1.03 PRODUCT DATA

- A. Collect Product Data into single submittal for each element of construction or system.
- B. Product Data includes standard printed information on manufactured products that has not been specially prepared for this Project, including, but not necessarily limited to following items:
 - 1. Manufacturer's product specifications and installation instructions.
 - 2. Catalog cuts.
 - 3. Standard color charts.
 - 4. Roughing-in diagrams and templates.
 - 5. Standard wiring diagrams.
 - 6. Printed performance curves.
 - 7. Operational range diagrams.
 - 8. Mill reports.
 - 9. Standard product operating and maintenance manuals.
- C. Modify standard data sheets and drawings to delete information which is not applicable to Project.
 - 1. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as shop drawings.
 - a. Mark each copy to show applicable choices and options.
 - b. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate applicable information.
 - c. Include following information:
 - 1) Manufacturer's printed recommendations.
 - 2) Compliance with recognized trade association standards.
 - 3) Compliance with recognized testing agency standards.
 - 4) Application of testing agency labels and seals.
 - 5) Notation of dimensions and clearances required and as verified by Field measurement.
 - 6) Notation of coordination requirements.
- D. Supplement standard information to provide additional information specifically applicable to Project:
 - 1. Clearly mark each copy to show applicable choices and options and identify pertinent materials, products, or models.
 - 2. Show dimensions and clearances required.
 - 3. Show performance characteristics and capacities.
 - 4. Show wiring or piping diagrams and controls.
- E. Do not submit Product Data until compliance with requirements of Contract Documents has been confirmed.
 - 1. Unless noncompliance with Contract Document provisions is observed, submittal may serve as final submittal.
- F. Submittals:
 - 1. Make electronic submittals as specified in "General Submittal Procedures and Requirements" Article.

- G. Distribution:
 - 1. Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities.
 - a. Show distribution on transmittal forms.
 - 2. Do not proceed with installation until applicable copy of Product Data is in installer's possession.
- H. Do not permit use of unmarked copies of Product Data in connection with construction.

1.04 SHOP DRAWINGS

- A. Shop drawings are technical drawings and data that have been specially prepared for Project, including but not necessarily limited to following items:
 - 1. Prepared information, drawn to accurate scale.
 - 2. Fabrication and installation drawings.
 - 3. Shopwork manufacturing instructions.
 - 4. Setting diagrams.
 - 5. Templates.
 - 6. Patterns.
 - 7. Coordination drawings (for use on Project Site).
 - 8. Schedules.
 - 9. Design mix formulas.
 - 10. Contractor's engineering calculations.
- B. Include following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
 - 6. Sheet Size:
 - a. Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 inch by 11 inch but no larger than 30 inch by 42 inch.
- C. Highlight, encircle, or otherwise indicate deviations from Contract Documents.
- D. Standard information prepared without specific reference to Project is not considered Shop Drawings.
- E. Submittals:
 - 1. Make electronic submittals as specified in "General Submittal Procedures" Article.
- F. Do not use Shop Drawings without appropriate final stamp indicating action taken in connection with construction.
- G. Do not reproduce Contract Documents or copy standard information as basis of Shop Drawings.

1.05 SAMPLES

- A. Samples are physical examples of Work, including, but not limited to, following items:
 - 1. Partial sections of manufactured or fabricated work
 - 2. Small cuts or containers of materials.
 - 3. Complete units of repetitively- used materials.
 - 4. Swatches showing color, texture and pattern.
 - 5. Color Range Sets.
 - 6. Units of Work to be used for independent inspection and testing.

- B. Office Samples:
 - 1. Sufficient size and quantity to clearly illustrate:
 - a. Functional characteristics of product or material, with integrally related parts and attachment devices.
 - b. Full range of color, texture and pattern.
 - 2. Where size and quantity are not specified, provide minimum of four samples, 12 inches by 12 inches, minimum size, where samples are required

- C. Field Samples and Mock-Ups:
 - 1. Erect at Project Site in location acceptable to Architect.
 - 2. Construct each sample or mock-up complete, including Work of trades required in finished Work.
 - 3. Size of area as specified in respective specification section.
 - 4. Remove mock-ups at conclusion of Work or when acceptable to Architect.

1.06 VERIFIED REPORTS

- A. Submit Verified Reports to Division of State Architect (DSA). Comply with California Code of Regulations, Title 24, Part 1, Sections 4-336 and 4-343.

1.07 MISCELLANEOUS SUBMITTALS – WORK RELATED

- A. Including, but not necessarily limited to, following types of submittals:
 - 1. Specially prepared warranties/guarantees.
 - 2. Standard printed warranties.
 - 3. Maintenance agreements.
 - 4. Printed industry standards.
 - 5. Collected and bound operating/maintenance manuals.
 - 6. Keying schedule, keys, and other security protection safety devices.
 - 7. Maintenance tools and spare parts.

1.08 CONTRACTOR RESPONSIBILITIES

- A. As defined in Division 00 General Conditions and following:
 - 1. Review shops drawings, product data and samples prior to submission to Architect.
 - 2. Determine and Verify:
 - a. Field measurements.
 - b. Field construction criteria.
 - c. Catalog numbers and similar data.
 - d. Conformance with specifications.
 - 3. Coordinate each submittal with requirements of Work and of Contract documents.

4. Notify Architect in writing, at time of submission, of deviations in submittals from requirements of Contract Documents
5. Do not begin fabrication of Work that requires submittals until return of submittals with Architect approval.

1.09 RESUBMITTAL REQUIREMENTS

- A. Shop Drawings:
 1. Revise initial drawings as required and resubmit as specified for initial submittal.
 2. Indicate on drawings changes that have been made other than those requested by Architect.
- B. Product Data and Samples:
 1. New data and samples, same as required for initial submittal.
- C. Multiple Resubmittals:
 1. Requirements cover initial submittal review and one resubmittal review when necessary.
 2. Architect's and/or Consultant's cost for evaluating additional submittals requested by Contractor beyond first resubmittal will be paid by Owner with reimbursement from Contractor by deductive change order.

1.10 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- A. Distribute reproductions of Shop Drawings and copies of Product Data which carry Architect/Engineer stamp to:
 1. Project Site file.
 2. Record Documents file.
 3. Other affected contractors.
 4. Subcontractors.
 5. Supplier or Fabricator.
 6. Owner's Project Inspector.
- B. Distribute samples that carry Architect's review stamps as directed by Architect.

1.11 ARCHITECT'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, Architect will review each submittal, mark to indicate action taken, and return promptly.
 1. Compliance with specified characteristics is Contractor's responsibility.
- B. Action Stamp:
 1. Architect will stamp each submittal with uniform, self-explanatory action stamp.
 2. Stamp will be appropriately marked, as follows, to indicate action taken:
 - a. Final Unrestricted Release:
 - 1) Where submittals are marked "No Exception Taken", that part of Work covered by submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- b. Final-But-Restricted Release:
 - 1) When submittals are marked "Make Correction Noted", that part of Work covered by submittal may proceed provided it complies with notations or corrections on submittal and requirements of Contract Documents.
 - 2) Final acceptance will depend on that compliance.
- c. Returned for Re-submittal:
 - 1) When submittal is marked "Revise and Resubmit", do not proceed with that part of Work covered by submittal, including purchasing, fabrication, delivery, or other activity.
 - 2) Revise or prepare new submittal in accordance with notations.
 - 3) Resubmit without delay.
 - 4) Repeat if necessary to obtain different action mark.
 - 5) Do not permit submittals marked "Rejected" or "Revise and Resubmit" to be used at Project Site, or elsewhere where Work is in progress.
- d. Other Action:
 - 1) Where submittal is primarily for information or record purposes, special processing or other activity, submittal will be returned, marked "Action Not Required".

PART 2 PRODUCTS *(Not Applicable)*

PART 3 EXECUTION *(Not Applicable)*

END OF SECTION 01 3300

SECTION 01 4100

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. General regulatory requirements pertaining to Work supplementary to other regulatory requirements mentioned or referenced elsewhere in Contract Documents.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Pertaining statutes, ordinances, laws, rules, codes, regulations, standards, and lawful orders of public authorities having jurisdiction of Work are incorporated into these Contract Documents same as if repeated in full, and as such are intended where reference is made in either singular or plural to Code or Building Code unless otherwise specified including, without limitation, those in list below.
1. Make available at Project Site such copies of listed documents applicable to Work as Architect or Owner may request including mentioned portions of California Code of Regulations (CCR).
- B. Project is fully governed under State of California's Codes Section Group 1, Chapter 4, Part 1, CCR, Title 24, as it pertains to school construction:
1. Inspector and Continuous Inspections of Work:
 - a. Per Sections 4-333(b) and 4-342.
 2. Tests and Testing Laboratory:
 - a. Per Section 4-335.
 - b. Owner pays for testing laboratory.
 3. Special Inspections:
 - a. Per Section 4-333(c).
 4. Verified Reports:
 - a. Submit per Sections 4-336 and 4-343(c).
 5. Administration:
 - a. Duties of Architect and Engineers:
 - 1) Per Sections 4-333(a) and 4-341.
 - b. Duties of Contractor:
 - 1) Per Section 4-343.
 - c. Verified Reports:
 - 1) Per Section 4-336.
 6. Arrange for copies of CCR, Title 24, Part 1, Part 2 Volumes 1 and 2, Part 3, and Part 9, to be made available during construction.
- C. Public regulatory requirements: Statutes, ordinances, laws, rules, codes, regulations, and standards include, but are not necessarily limited to, following:
1. California Code of Regulations (CCR):
 - a. Title 19 - Public Safety, current edition.
 - b. Title 24, Part 1 – 2022 California Administrative Code
 - c. Title 24, Part 2 – 2022 California Building Code (CBC), Volumes 1 and 2.
 - d. Title 24, Part 3 – 2022 California Electrical Code (CEC).

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- e. Title 24, Part 4 – 2022 California Mechanical Code (CMC)
 - f. Title 24, Part 5 – 2022 California Plumbing Code (CPC).
 - g. Title 24, Part 6 – 2022 California Energy Code
 - h. Title 24, Part 9 – 2022 California Fire Code (CFC).
 - i. Title 24, Part 10 – 2022 California Existing Building Code (CEBC):
 - 1) Includes Parts 8 and 12:
 - a) Part 8 – California Historical Building Code (CHBC)
 - b) Part 12 – California Referenced Standards Code (CRSC)
 - j. Title 24, Part 11 – 2022 California Green Building Standards Code (GBSC)
2. Other statutes, ordinances, laws, regulations, rules, orders, and codes specified in other Sections of Specifications or bearing on Work.

1.03 GOVERNING REGULATIONS/AUTHORITIES

- A. Architect has contacted authorities having jurisdiction where necessary to obtain information necessary for preparation of Contract Documents
1. Information may or may not be of significance to Contractor.
 2. Owner and Architect, at request of Contractor, are to contact authorities having jurisdiction directly for information and decisions having bearing on Work.

1.04 SUBMITTALS

- A. Permits, Licenses, and Certificates:
1. Submit for Owner's records, copies of following, including but not necessarily limited to:
 2. Permits
 3. Licenses
 4. Certifications
 5. Inspection reports
 6. Releases
 7. Jurisdictional settlements
 8. Notices
 9. Receipts for fee payments
 10. Judgments, and similar documents
 11. Correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of Work.

PART 2 PRODUCTS *(Not Applicable)*

PART 3 EXECUTION *(Not Applicable)*

END OF SECTION 01 4100

SECTION 01 4200

REFERENCES

PART 1 GENERAL

1.01 DEFINITIONS

- A. Basic contract definitions are included in Division 00 General Conditions.
- B. Indicated:
 - 1. Refers to graphic representations, notes or schedules on Drawings, or other paragraphs or schedules in Specifications, and similar requirements in Contract Documents.
 - 2. Where terms such as “shown”, “noted”, “scheduled”, and “specified” are used, it is to help locate the reference
 - a. No limitation of location is intended except as specifically noted.
- C. Directed:
 - 1. Terms such as “directed”, “requested”, “authorized,” “selected”, “approved”, “required”, and “permitted” mean “directed by Architect”, “requested by Architect”, and similar phrases.
 - 2. No implied meaning is to be interpreted to extend Architect’s responsibility into Contractor’s area of construction supervision.
- D. Approved:
 - 1. Where used in conjunction with Architect’s action on Contractor’s submittals, applications, and requests, is limited to Architect’s duties and responsibilities as stated in General Conditions.
- E. Regulations:
 - 1. Includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within construction industry that control performance of Work.
- F. Furnish:
 - 1. Means supply and deliver to Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. Install:
 - 1. Describes operations at Project Site including actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimensions, finishing, curing, protecting, cleaning, and similar operations.
- H. Provide:
 - 1. Means furnish and install, complete and ready for intended use.
- I. Installer:
 - 1. Contractor or entity engaged by Contractor, either as employee, subcontractor, or sub-subcontractor, for performance of particular construction activity, including installation, erection, application, and similar operations.
 - 2. Installers are required to be experienced in operations they are engaged to perform.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- J. Project Site:
 - 1. Space available to Contractor for performance of construction activities, either exclusively or in conjunction with others performing other construction activities as part of Project.
 - 2. Extent of Project Site is shown on Drawings and may or may not be identical with description of land upon which Project is to be built.
- K. Testing Laboratories:
 - 1. Independent entity engaged to perform specific inspections or tests, either at Project Site or elsewhere, and to report on and, when required, to interpret results of those inspections or tests.

1.02 INDUSTRY STANDARDS

- A. Applicability of Standards:
 - 1. Except where Contract Documents include more stringent requirements, applicable construction industry standards have same force and effect as if bound or copied directly into Contract Documents.
 - a. Such standards are made part of Contract Documents by reference.
 - 2. Individual Sections indicate which codes and standards Contractor must make available at Project Site for reference.
- B. Publication Dates:
 - 1. Comply with standard in effect as of date of Contract Documents.
- C. Copies of Standards:
 - 1. Each entity engaged in construction on Project is required to be familiar with industry standards.
 - 2. Applicable standards are not bound with Contract Documents.
 - 3. Where copies of standards are required by individual specification sections or are needed for performance of required construction activity, obtain copies directly from publication source.
- D. Conflicting Requirements:
 - 1. Where compliance with two or more standards is specified, and standards establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to Architect for decision before proceeding.

1.03 GOVERNING REGULATIONS/AUTHORITIES

- A. Architect has contacted authorities having jurisdiction where necessary to obtain information necessary for preparation of Contract Documents
 - 1. That information may or may not be of significance to Contractor.
 - 2. Owner and Architect, at request of Contractor, are to contact authorities having jurisdiction directly for information and decisions having bearing on Work.

PART 2 PRODUCTS *(Not Applicable)*

PART 3 EXECUTION *(Not Applicable)*

END OF SECTION 01 4200

SECTION 01 4500

QUALITY CONTROL

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Administrative and procedural requirements for quality control services.
 2. Quality control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities.
 - a. They do not include contract enforcement activities performed by Architect.
 3. Inspection and testing services are required to verify compliance with requirements specified or indicated.
 - a. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.
 4. Requirements for Contractor to provide quality control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- B. Related Requirements Specified Elsewhere:
1. Inspections and testing required by laws, ordinances, rules, regulations or orders of public authorities: General Conditions.
 2. Certification of Products:
 - a. Respective specification sections.
 3. Test, Adjust and Balance of Equipment:
 - a. Respective specification sections.
 4. Tests and Standards:
 - a. Each specification section listed.
- C. Related Sections:
1. Section 01 4100: Regulatory Requirements; current Code edition.

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition.
- B. American Concrete Institute (ACI):
1. ACI 318 – Building Code Requirements for Structural Concrete and Commentary, current edition.

1.03 SELECTION OF TESTING AGENCY

- A. Owner will select and employ consultant, testing laboratory or inspection agency to perform specified services.
- B. Employment of Testing Laboratory in no way relieves Contractor of his obligation to perform Work in accord with Contract.

1.04 PROJECT INSPECTOR

- A. Owner will select and employ Project Inspector, approved by DSA.

1.05 PAYMENT

- A. Costs of quality control services will be initially paid for by Owner. Following quality control services, chargeable to Contractor, will be reimbursed to Owner by deductive change order:
 - 1. Batch Plant Inspection.
 - 2. Taking and testing cores from concrete.
 - 3. Testing of reinforcing steel test specimens.

1.06 DEFICIENCIES

- A. Cost of tests or inspections due to following will be reimbursed to Owner by deductive change order.
 - 1. Retesting because of failure of initial samples.
 - 2. Additional costs due to overtime work or extra shifts work because of improper scheduling of Work or of delivery of materials by Contractor.
 - 3. Failure to properly notify laboratory.
 - 4. Changes in sources, lots or suppliers of materials after original tests.
 - 5. Changes in methods or materials of construction requested by Contractor that require testing, inspection, or other related services in excess of that required by original design.
 - 6. Concrete mix designs in excess of first successful design for each concrete type.
 - 7. Overtime or extra shift work requiring overtime work by Owner's Inspector.

1.07 TESTS AND INSPECTION

- A. Testing laboratory or Owner's Project Inspector, and not Contractor, will make selection of material required to be tested.
- B. Notify Owner's Project Inspector in sufficient time in advance of manufacture of material to be supplied by him under Contract Documents, which must, by terms of Contract be tested, in order that Owner may arrange for testing of same at source of supply.
- C. Do not incorporate into Project, material shipped by Contractor from source of supply prior to having satisfactorily passed such testing and inspection or prior to receipt of notice from Project Inspector that such testing and inspection will not be required.

1.08 TESTING AGENCY SERVICES

- A. Cooperate with Architect and Contractor
 - 1. Provide qualified personnel promptly on notice.
- B. Perform specified inspections, sampling and testing of materials and methods of construction:
 - 1. Comply with specified standards; ASTM, other recognized authorities, and as specified.
 - 2. Ascertain compliance with requirements of Contract Documents.

- C. Attend pre-construction conference and progress meetings when requested by Architect or Owner.
- D. Perform additional services as required by Owner.
- E. Submittals:
 - 1. Promptly submit copies of reports of inspections and tests, mill analysis, concrete mix designs and certifications per applicable sections of specification.
 - 2. Submit one copy of test reports to:
 - a. Owner.
 - b. Architect.
 - c. Contractor.
 - d. Project Inspector.
 - 3. Include tests made, regardless of whether such tests indicate that material is satisfactory or unsatisfactory.
 - 4. Report samples taken but not tested.
 - 5. Report records of special sampling operations as required.
 - 6. Show in report that material or materials were sampled and tested in accordance with requirements of Title 24 and with approved specifications.
 - 7. Show specified design strength in test reports.
 - a. State definitely in test reports whether or not material or materials tested comply with requirements.
- F. Report Data:
 - 1. Written reports of each inspection, test, or similar service include, but are not limited to, following:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address, and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making inspection or test.
 - f. Designation of Work and test method.
 - g. Identification of product and Specification Section.
 - h. Complete inspection or test data.
 - i. Test results and interpretation of test results.
 - j. Ambient conditions at time of sample taking and testing.
 - k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
 - l. Name and signature of laboratory inspector.
 - m. Recommendations on retesting.
- G. Testing Agency is not authorized to:
 - 1. Release, revoke, alter, or enlarge requirements of Contract Documents or approve or accept portions of Work.
 - 2. Perform duties of Contractor.

1.09 INSPECTION BY OWNER AND PROJECT INSPECTOR

- A. Provide full access to Owner and his Project Inspector for purpose of inspection of parts of Work and to shops wherein Work is in preparation
 - 1. Maintain proper facilities and provide safe access for such inspection.

1.10 INSPECTION BY OWNER

- A. Owner retains right to reject materials and workmanship which are defective, or to require their correction.
 - 1. Satisfactorily correct rejected workmanship and remove rejected materials from premises without charge to Owner.
 - 2. When Contractor does not correct such rejected work within reasonable time, fixed by written notice, Owner may correct same and charge expense to Contractor.

- B. Should it be considered necessary or advisable by Owner at or before final acceptance of entire Work to make examination of Work already completed by removing or tearing out same, upon request, promptly furnish necessary facilities, labor, and materials.
 - 1. When such Work is found to be defective due to fault of Contractor or his subcontractor, defray expenses of such examinations and of satisfactory reconstruction.
 - 2. Should such Work be found to meet requirements of Contract, Contractor will be allowed additional cost of labor and material necessarily involved in examination and replacement.

1.11 WORK BY OWNER'S PROJECT INSPECTOR

- A. Owner's Project Inspector will perform following tests and inspections:
 - 1. Concrete slump tests.
 - 2. Concrete cylinder samples.
 - 3. Continuous inspection of masonry work.
 - 4. Mortar and grout prisms.
 - 5. Special Inspections for Welding.

1.12 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested .

- B. Provide to agency, selected preliminary representative samples of materials to be tested, in required quantities or assist agency in taking samples.

- C. Furnish incidental labor and facilities:
 - 1. To provide access to Work.
 - 2. To obtain and handle samples at Site.
 - 3. To facilitate inspections and tests.
 - 4. For agency's exclusive use for storage and curing of test samples.
 - 5. To provide security and protection of samples and test equipment at Project Site.

- D. Notify testing agency sufficiently in advance of operations to permit assignment of personnel and scheduling of tests.

- E. Coordination:
 - 1. Coordinate sequence of activities to accommodate required services with minimum of delay.

2. Coordinate activities to avoid necessity of removing and replacing construction to accommodate inspections and tests.
3. Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

1.13 MISCELLANEOUS TESTS AND INSPECTIONS

- A. Soil and Compaction Testing and Inspection:
 1. Performed by Project Geotechnical (Soils) Engineer employed and paid by Owner.
- B. Special Tests:
 1. Special tests requested by Owner or Architect or DSA will be paid for by Owner, except that when such tests fail, deduct costs from Contract Price by Change Order.

PART 2 PRODUCTS *(Not Applicable)*

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION

- A. Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes.
- B. Protect construction exposed by or for quality control service activities, and protect repaired construction.
- C. Repair and protection is Contractor's responsibility, regardless of assignment of responsibility for inspection, testing, or similar services.

3.02 SCHEDULE OF TESTS, INSPECTIONS, AND METHODS

- A. Required Tests and Inspections:
 1. Perform required Tests and Inspections as set forth in California Building Code and ACI 318, as referenced in DSA Form 103

END OF SECTION 01 4500

PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT

SECTION 01 5000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Temporary facilities required for this Work include, but are not necessarily limited to:
 - a. Temporary utilities such as heat, water, electricity, and telephone.
 - b. Field offices and sheds
 - c. Sanitary facilities.
 - d. Construction aids.
 - e. Barriers.
 - f. Temporary controls.
 - g. Temporary tree and plant protection
 - h. Temporary informational signs.
- B. Related Sections:
1. Section 01 5713: Temporary Erosion and Sedimentation Controls
 2. Section 02 4113: Selective Site Demolition; additional protection requirements.
 3. Section 31 1000: Site Clearing
- C. Related Requirements:
1. Refer to District's Division 00 Documents, including General Conditions, and other Division 01 Sections, for additional requirements.
 2. Refer to Division 33 Sections for additional traffic control requirements.
 3. Permanent installation and hook-up of various utility lines are described in other pertinent sections.
 4. Comply with requirements of pertinent safety regulations for equipment furnished by subcontractors.
- D. Work Not Part of This Section:
1. Ladders, planks, hoists, and similar items normally furnished by individual trades in execution of their own portions of Work.

1.02 PROJECT CONDITIONS

- A. Use means necessary to maintain temporary facilities in proper and safe condition throughout progress of Work.

PART 2 PRODUCTS

2.01 UTILITIES

- A. Water:
1. Provide necessary temporary water lines and water supply and upon completion of Work, remove such temporary facility.
 2. Provide and pay for water needed for construction.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- B. Electricity:
 - 1. Provide necessary temporary wiring and upon completion of Work, remove such temporary facility.
 - 2. Provide area distribution boxes so located that individual trades may furnish and use 100 foot maximum length extension cords to obtain adequate power and artificial lighting at points where needed for work, inspection, and safety.
 - 3. Provide and pay for electricity needed for construction.
- C. Heating:
 - 1. Provide and maintain heat necessary for proper conduct of operations needed in Work.
- D. Telephone:
 - 1. Make necessary arrangements and pay costs for installation and operation of telephone service to Contractor's office on Project Site and Owner's Project Inspector's office on Project Site.
 - 2. Install telephone on separate line for each temporary office.
 - a. Where office has more than one occupant, provide telephone for each additional occupant.
 - 3. Coin operated telephones are not acceptable.

2.02 FIELD OFFICES AND SHEDS

- A. Contractor's Facilities:
 - 1. Provide field office building and sheds adequate in size and accommodation for Contractor's offices, supply, and storage.
- B. Owner's Project Inspector's Office:
 - 1. Provide lockable office at least 10 feet by 12 feet in dimension with lockable operable window, serviceable finishes, lighting, heating, and air conditioning, for use by Owner's Project Inspector.
 - 2. Furnish with lockable desk, reference table, lockable 4 drawer file cabinet, plan rack, and two chairs.
 - 3. Subject to District approval, provide space in Contractor's Field Office for Owner's Project Inspector, in lieu of separate office.
- C. Provide and maintain on premises, where directed, watertight storage sheds for materials which might be damaged by weather, including storage facilities for concrete test samples or other material samples required for Work.

2.03 SANITARY FACILITIES

- A. Sanitary facilities include temporary toilets, wash facilities, and drinking water fixtures.
 - 1. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
 - 2. Install where facilities will best serve Project's needs.
 - 3. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility.
 - 4. Provide covered waste containers for used material.

- B. Temporary Toilet Units:
 - 1. Provide self-contained, single-occupant toilet units of chemical, aerated recirculation, or combustion type.
 - 2. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
 - 3. Provide separate facilities for male and female personnel.
 - 4. Maintain in sanitary condition.
- C. Wash Facilities:
 - 1. Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for healthy and sanitary condition.
 - 2. Dispose of drainage properly.
 - 3. Supply cleaning compounds appropriate for each condition.
 - 4. Provide safety showers, eyewash fountains , and similar facilities for convenience, safety, and sanitation of personnel.
- D. Drinking-Water Facilities:
 - 1. Provide containerized, tap-dispenser, bottled water drinking water units, including paper supply.
- E. Use of Owner's toilet facilities is not permitted.

2.04 CONSTRUCTION AIDS

- A. Provide construction aids and equipment required by personnel and to facilitate execution of Work
 - 1. Scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other such facilities and equipment.
- B. Provide necessary facilities and means of access to structure so that Building Inspectors, Special Inspectors, Architect and Structural Engineer may inspect structure or portions of structure as necessary.
 - 1. Means of access includes, but is not necessarily limited to, ladders, scaffolds, and similar items.

2.05 BARRIERS

- A. Temporary Fencing:
 - 1. Provide temporary fence around entire construction area as required for safety and protection.
 - 2. Construction:
 - a. Provide chain link fencing not less than six feet in height, complete with metal or wood posts and required bracing, and with suitably locked truck and pedestrian gates as required.
 - 3. Provide opaque, fabric or plastic windscreen material, full height and run of fencing, including gates.
- B. Tree and Plant Protection:
 - 1. Preserve and protect existing trees and plants at Project Site that are designated to remain, and those adjacent to Project Site.
 - 2. Provide temporary barriers around each, or around each group of trees or plants.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

3. Trenching Near Trees:
 - a. Where utility trenches are required near trees, excavate under or around tree roots by hand or with air spade.
 - b. Do not cut main lateral tree roots or taproots.
 - 1) Cut only smaller roots that interfere with installation of utilities.
 - 2) Do not allow exposed roots to dry out before placing permanent backfill.

2.06 TEMPORARY CONTROLS

- A. Contractor Responsibility:
 1. Specific safety requirements by governmental authorities, including requirements of latest Occupational Safety and Health Act (OSHA) and Cal/OSHA.
- B. Provide and maintain methods, equipment, and temporary construction, as necessary to provide controls over environmental conditions at construction site and related areas under Contractor's control.
 1. Remove physical evidence of temporary facilities at completion of Work.
 2. Comply with requirements of authorities having jurisdiction.
- C. Dust Control:
 1. Provide positive methods and apply dust control materials to minimize raising dust from construction operations, and provide positive means to prevent airborne dust from dispersing into atmosphere.
- D. Water Control:
 1. Provide methods to control surface water to prevent damage to Project, Site, or adjoining properties.
 2. Control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas and to direct drainage to proper runoff.
 3. Provide, operate and maintain hydraulic equipment of adequate capacity to control surface water.
 4. Dispose of drainage water in manner to prevent flooding, erosion, or other damage to Project Site or to adjoining areas.
 5. Comply with requirements specified in Section 01 5713.
- E. Debris Control:
 1. Maintain areas under Contractor's control free of extraneous debris.
 2. Prevent accumulation of debris at construction site, storage and parking areas, or along access roads.
 3. Provide containers for deposit of debris as specified in Section 01 7419.
- F. Pollution Control:
 1. Provide methods, means and facilities required to prevent contamination of soil, water and atmosphere by discharge of noxious substances from construction operations.
 2. Provide equipment and personnel to perform emergency measures required to contain spillage, and to remove contaminated soils and liquids.
 3. Take special measures to prevent harmful substances from entering public waters.

- a. Prevent disposal of wastes, effluents, chemicals, and other such substances in sanitary or storm sewers.
- G. Temporary Fire Protection:
- 1. Install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses.
 - 2. Comply with NFPA 241 .
 - 3. Prohibit smoking in construction areas.
 - 4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 5. Develop and supervise overall fire prevention and protection program for personnel at Project Site.
 - a. Review needs with local fire department and establish procedures to be followed.
 - b. Instruct personnel in methods and procedures.
 - c. Post warnings and information.

2.07 TEMPORARY INFORMATIONAL SIGNS

- A. Provide temporary informational signs as follows:
 - 1. As required by codes, laws and regulatory agencies and to:
 - a. Inform public and persons seeking entrance to Project.
 - b. Identify key elements of construction facilities.
 - c. Direct traffic.
- B. Prepare temporary signs of sizes indicated.
 - 1. Erect on Project Site as approved by Architect.
 - 2. Support on posts or framing of preservative treated wood or steel.
 - 3. Do not permit installation of unauthorized signs..

2.08 OWNERSHIP OF TEMPORARY FACILITIES AND CONTROLS

- A. Items provided by Contractor under this Section remain property of Contractor
 - 1. Remove such items from job site immediately upon completion of Work..

PART 3 EXECUTION

3.01 MAINTENANCE AND REMOVAL

- A. Maintain temporary facilities as long as needed for safe and proper completion of Work.
- B. Remove such temporary facilities as rapidly as progress of Work will permit, or as directed by Architect.

END OF SECTION 01 5000

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 01 5713

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Prevention of erosion due to construction activities.
 - 2. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
 - 3. Restoration of areas eroded due to insufficient preventive measures.
 - 4. Performance Bond.
 - 5. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

- B. Related Sections:
 - 1. Section 31 0000: Earthwork; temporary and permanent grade changes for erosion control.
 - 2. Section 31 1000: Site Clearing; limits on clearing; disposition of vegetative clearing debris.

1.02 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM D 4873 – Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.

- B. United States Environmental Protection Agency (EPA):
 - 1. National Pollutant Discharge Elimination System (NPDES):
 - a. Construction General Permit (CGP); current edition.

- C. Public Works Standards, Inc.:
 - 1. Standard Specifications for Public Works Construction (SSPWC):
 - a. The "Greenbook"; current edition.
 - 2. Standard Plans for Public Works Construction (SPPWC); current edition.

- D. California Stormwater Quality Association (CASQA):
 - 1. Best Management Practice (BMP) Handbook, current edition.

1.03 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of U.S. Environmental Protection Agency (EPA) for erosion and sedimentation control, as specified for National Pollutant Discharge Elimination System (NPDES), Phases I and II, under requirements for 2022 Construction General Permit (CGP).

- B. Comply with requirements of California State Construction General Permit Order 2022-0057-DWQ (adopted September 8, 2022) for erosion and sedimentation control, even though this Project is not required by law to comply.

- C. Best Management Practices Standard:

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

1. Federal Highway Administration Best Management Practices for Erosion and Sediment Control.
- D. Develop and follow Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
- E. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained.
 1. Furnish documentation required to obtain applicable permits.
- F. Provide to Owner Performance Bond covering erosion and sedimentation preventive measures only, in amount equal to 100 percent of cost of erosion and sedimentation control work.
- G. Timing:
 1. Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- H. Storm Water Runoff:
 1. Control increased storm water runoff due to disturbance of surface cover due to construction activities for Project.
 2. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
 3. Anticipate runoff volume due to most extreme short term and 24-hour rainfall events that might occur in 25 years.
- I. Erosion On Site:
 1. Minimize wind, water, and vehicular erosion of soil on Project Site due to construction activities for Project.
 2. Control movement of sediment and soil from temporary stockpiles of soil.
 3. Prevent development of ruts due to equipment and vehicular traffic.
 4. When erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- J. Erosion Off Site:
 1. Prevent erosion of soil and deposition of sediment on other properties caused by water leaving Project Site due to construction activities for Project.
 2. Prevent windblown soil from leaving Project Site.
 3. Prevent tracking of mud onto public roads outside Project Site.
 4. Prevent mud and sediment from flowing onto sidewalks and pavements.
 5. When erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- K. Sedimentation of Waterways On Site:
 1. Prevent sedimentation of waterways on Project Site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 2. When sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
 3. When sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

- L. Sedimentation of Waterways Off Site:
 - 1. Prevent sedimentation of waterways off Project Site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 2. When sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
- M. Open Water:
 - 1. Prevent standing water that could become stagnant.
- N. Maintenance:
 - 1. Maintain temporary preventive measures until permanent measures have been established.

1.04 SUBMITTALS

- A. Certificate:
 - 1. Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements.
 - a. Signed by legally authorized official of manufacturer.
 - b. indicate actual minimum average roll values.
 - 2. Identify fabric by roll identification numbers.
- B. Inspection Reports:
 - 1. Report of each inspection.
 - 2. Identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Gravel:
 - 1. Conforming to Greenbook standard.
- B. Grass Seed for Temporary Cover:
 - 1. Select species appropriate to climate, planting season, and intended purpose.
 - 2. When same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine Project Site and identify existing features that contribute to erosion resistance.
- B. Maintain such existing features to greatest extent possible.

3.02 PREPARATION

- A. Schedule Work so that soil surfaces are left exposed for minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

- A. In cases, where permanent erosion resistant measures have been installed temporary preventive measures are not required.
- B. Stabilized Construction Entrances:
 - 1. Traffic-bearing aggregate surface conforming to BMP TC-1 requirements.
 - a. Width:
 - 1) As required – 20 feet, minimum.
 - b. Length:
 - 1) 50 feet minimum.
 - c. Provide at each construction entrance from public right-of-way.
 - d. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.
- C. Linear Sediment Barriers:
 - 1. Made of silt fences or gravel bags.
 - 2. Provide linear sediment barriers as indicated on Drawings.
- D. Storm Drain Curb Inlet Sediment Trap:
 - 1. As detailed on Drawings.
- E. Storm Drain Drop Inlet Sediment Traps:
 - 1. As detailed on Drawings.
- F. Soil Stockpiles:
 - 1. Protect using one of following measures:
 - a. Cover with polyethylene film, secured by placing soil on outer edges.
 - b. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.

3.04 INSTALLATION

- A. Stabilized Construction Entrances:
 - 1. Traffic-bearing aggregate surface conforming to BMP TC-1 requirements.
 - a. Excavate minimum of 6 inches.
 - b. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
 - c. Place and compact at least 6 inches of 1.5 to 3.5 inch diameter stone.
- B. Silt Fences:
 - 1. Conforming to BMP SE-1 requirements and following:
 - a. Store and handle fabric in accordance with ASTM D4873.
 - b. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
 - c. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.

- d. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
 - e. Install with top of fabric at nominal height and embedment as specified.
 - f. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
 - g. Wherever runoff will flow around end of barrier or over top, provide temporary splash pad or other outlet protection
 - 1) At such outlets in run of barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.
- C. Install gravel bags conforming to BMP SE-6 requirements.

3.05 MAINTENANCE

- A. As minimum, maintain BMPs as described in reference BMP Handbook.
- B. Inspect preventive measures weekly, within 24 hours after end of storm that produces 0.5 inches or more rainfall at Project Site, and daily during prolonged rainfall.
- C. Repair deficiencies immediately.
- D. Silt Fences:
 - 1. Promptly replace fabric that deteriorates unless need for fence has passed.
 - 2. Remove silt deposits that exceed one-third of height of fence.
 - 3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- E. Clean out temporary sediment control structures weekly and relocate soil on Project Site.
- F. Place sediment in appropriate locations on Project Site
 - 1. Do not remove sediment from Project Site.

3.01 CLEANING

- A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Engineer.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION 01 5713

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 01 6000

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Following Administrative and Procedural Requirements:
 - a. Selection of products for use in Project
 - b. Product delivery, storage, and handling.
 - c. Manufacturers' standard warranties on products.
 - d. Special warranties.
 - e. Product substitutions.
- B. Related Sections:
 - 1. Section 01 4200: References; applicable industry standards for products specified.
 - 2. Section 01 7700: Closeout Procedures; submittal of warranties for contract closeout.
- C. Related Requirements:
 - 1. Refer to District's Division 00 Documents, including General Conditions, and other Division 01 Sections, for additional requirements.
 - 2. Specific requirements for warranties on products and installations specified to be warranted are included in appropriate Divisions 02 through 33 Sections.

1.02 DEFINITIONS

- A. Definitions used in this Article are not intended to change meaning of other terms used in Contract Documents, such as "specialties", "systems", "structure", "finishes", "accessories", and similar terms.
 - 1. Such terms are self-explanatory and have well recognized meanings in construction industry.
- B. Products:
 - 1. Items purchased for incorporating into Work, whether purchased for Project or taken from previously purchased stock.
 - 2. Term "product" includes terms "material," "equipment," and terms of similar intent.
 - 3. Named Products:
 - a. Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of Contract Documents.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

4. New Products:
 - a. Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise.
 - 1) Products salvaged or recycled from other projects are not considered new products.
- C. Substitutions:
 1. Changes in products, materials, equipment, and methods of construction required by Contract Documents and proposed by Contractor
 2. Following are not considered substitutions:
 - a. Substitutions requested during bidding period, and accepted by written Addendum prior to opening of bids or award of Contract.
 3. Revisions to Contract Documents requested by Owner or Architect.
 4. Specified options of products and construction methods included in Contract Documents.
 5. Compliance with governing regulations and orders issued by governing authorities.
- D. Basis-of-Design Product Specification:
 1. Where specific manufacturer's product is named and accompanied by words "Basis-of-Design", including make or model number or other designation, to establish significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
- E. Manufacturer's Warranty:
 1. Preprinted written warranty published by individual manufacturer for particular product and specifically endorsed by manufacturer to Owner.
- F. Special Warranty:
 1. Written warranty required by or incorporated into Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.03 SUBMITTALS

- A. Product Listing Schedule:
 1. Prepare schedule showing products specified in tabular form acceptable to Architect to include:
 - a. Generic names of products required.
 - b. Manufacturer's name and proprietary product names for each item listed.
 2. Form:
 - a. Prepare Product Listing Schedule with information on each item tabulated under following column headings:
 - 1) Related Specification Section number.

- 2) Generic name used in Contract Documents.
 - 3) Proprietary name, model number and similar designations.
 - 4) Manufacturer's name and address.
 - 5) Supplier's name and address.
3. Completed Schedule:
- a. Within fifteen days after date of commencement of Work submit four copies of completed Product Listing Schedule.
 - 1) Furnish written explanation for omissions of data, and for known variations from Contract requirements.

1.04 QUALITY ASSURANCE

- A. To fullest extent possible, provide products of same kind, from single source.

1.05 REQUESTS FOR SUBSTITUTIONS

- A. Requests for Substitutions received after award of Contract will be considered only in case of substantiated product unavailability, or other conditions beyond control of Contractor.
- B. Substitution Requests:
1. Submit one electronic copy (PDF) of each request for consideration.
 2. Identify product or fabrication or installation method to be replaced.
 3. Include Specification Section number and title and Drawing numbers and titles.
 - a. Refer to Article 2.02, in this Section.
 4. Substitution Request Form:
 - a. Use form provided by Owner.
 - 1) In absence of Owner furnished form, use form included at end of this Section.
 - b. Other forms will not be accepted.
 - c. Requests received without properly completed substitution request form will be rejected without further review.
 5. Documentation:
 - a. Show compliance with specified requirements for substitutions and following, as applicable:
 - 1) Statement indicating why specified material or product cannot be provided.
 - a) Submit statement on official letterhead of Contractor, supplier, or manufacturer, signed by an officer of the Company.
 - b) Statement will be subject to independent verification by Architect.
 - 2) Product identification, including manufacturer's name and address.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- 3) Coordination information, including list of changes or modifications needed to other parts of Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
- 4) Detailed, side-by-side comparison of significant qualities including attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
- 5) Product Data, including drawings and descriptions of products and fabrication and installation procedures.
- 6) Structural calculations, where applicable or requested, prepared and signed by registered Structural Engineer licensed in California.
- 7) Samples, where applicable or requested.
- 8) List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
- 9) Material test reports from qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
- 10) Research/evaluation reports evidencing compliance with building code in effect for Project, from model code organization acceptable to authorities having jurisdiction.
- 11) Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for Work, including effect on overall Contract Time.
 - a) When specified product or method of construction cannot be provided within Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
- 12) Cost information, including proposal of change, when occurring, in Contract Sum.
 - a) When substitution request is made after award of Contract, for other than reasons stated, include in request, benefit to Owner, in form of cost reduction.
- 13) Designation of availability of maintenance services, sources of replacement materials.
- 14) Contractor's certification that proposed substitution complies with requirements in Contract Documents and is appropriate for applications indicated.
- 15) Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

- C. Basis-of-Design Product Specification Submittal:
1. Comply with requirements in Section 01 3300.
 2. Show compliance with requirements.

- D. Multiple Resubmittals:
1. Requests for Substitutions made after Award of Contract:
 - a. Requirements cover initial Request for Substitution review and one resubmittal review when necessary.
 2. Architect's and/or Consultant's cost for evaluating additional submittals requested by Contractor beyond first resubmittal will be paid by Owner with reimbursement from Contractor by deductive change order.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products using means and methods that will prevent damage, deterioration and loss, including theft; comply with manufacturer's written instructions.
1. Schedule delivery to minimize long term storage at Project Site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
 3. Deliver products to Project Site in undamaged condition in manufacturer's original sealed container, or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
 4. Inspect products on delivery to ensure compliance with Contract Documents, and to ensure products are undamaged and properly protected.
 5. Store products in manner to facilitate inspection and measurement of quantity or counting of units.
 6. Store materials in manner that will not endanger Project structure.
 7. Store products subject to damage by elements under cover in weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 9. Protect stored products from damage.

1.07 PRODUCT WARRANTIES

- A. Warranties specified in other Sections are in addition to, and run concurrent with, other warranties required by Contract Documents.
1. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of Contract Documents.
- B. Special Warranties:
1. Prepare written document that contains appropriate terms and identification, ready for execution.
 - a. Submit draft for approval before final execution.
 2. Manufacturer's Standard Form:

- a. Modified to include Project-specific information and properly executed.
 3. Refer to Division 26 through 32 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time:
1. Comply with requirements in Section 01 7700 and General Conditions.

PART 2 PRODUCTS

2.01 PRODUCT SELECTION

- A. General Product Requirements:
1. Provide products that comply with Contract Documents, that are undamaged and, unless otherwise indicated, unused at time of installation.
 2. Provide products complete with accessories, trim, finish, safety guards and other devices and details needed for complete installation and for intended use and effect.
 3. Standard Products:
 - a. Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 4. Owner reserves right to limit selection to products with warranties not in conflict with requirements of Contract Documents.
 5. Where products are accompanied by term "as selected", Architect will make selection.
 6. Where products are accompanied by term "match sample", sample to be matched is Architect's.
 7. Descriptive, performance, and reference standard requirements in Specifications establish "salient characteristics" of products.
 8. Where products are specified by name and accompanied by term "or equal", or "or approved equal", or "or approved", comply with provisions in "Product Substitutions" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Procedures for product selection include following:
 - a. Product:
 - 1) Where Specification paragraphs or subparagraphs titled "Product" name single product and manufacturer, provide product named.
 - 2) Substitutions may be considered, unless otherwise indicated.

- b. Products:
 - 1) Where Specification paragraphs or subparagraphs titled "Products" introduce list of names of both products and manufacturers, provide one of products listed that complies with requirements.
 - 2) Products and manufacturers are listed alphabetically and do not indicate order of preference, unless otherwise indicated.
 - c. Manufacturer/Source:
 - 1) Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide product by manufacturer or from source named that complies with requirements.
 - 2) Substitutions may be considered, unless otherwise indicated.
 - d. Manufacturers:
 - 1) Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce list of manufacturers' names, provide product by one of manufacturers listed that complies with requirements.
 - 2) Where manufacturers are specified by name, accompanied by term "or equal", or "or approved equal" comply with provisions in "Product Substitutions" Article to obtain approval for use of an unnamed product.
 - e. Product Options:
 - 1) Where Specification paragraph titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on specific product or system, provide either specific product or system indicated or comparable product or system by another manufacturer.
 - 2) Comply with provisions in "Product Substitutions" Article to obtain approval for use of unnamed product.
- C. Basis-of-Design Products:
- 1. Where Specification paragraphs or subparagraphs titled "Basis-of-Design Product" are included and also introduce or refer to list of manufacturers' names, provide either specified product or comparable product by one of other named manufacturers.
 - 2. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on product named.
 - 3. Comply with provisions in "Product Substitutions" Article to obtain approval for use of unnamed product.
 - 4. Substitutions may be considered.
- D. Visual Matching Specification:
- 1. Where Specifications require matching established sample, select product and manufacturer that complies with requirements and matches Architect's sample.
 - 2. Architect's decision will be final on whether proposed product matches satisfactorily.

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FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

3. Where no product is available within specified category that matches satisfactorily and complies with other specified requirements, comply with provisions of Contract Documents on "substitutions" for selection of matching product.
- E. Visual Selection Specification:
1. Where Specifications include phrase "as selected from manufacturer's colors, patterns, textures" or similar phrase, select product and manufacturer that complies with other specified requirements.
 2. Standard Range:
 - a. Where Specifications include phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
 3. Full Range:
 - a. Where Specifications include phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.
- F. Performance Specification Requirements:
1. Where Specifications require compliance with performance requirements, provide products that comply with requirements, and are recommended by manufacturer for application indicated.
 2. General overall performance of product is implied where product is specified for specific application.
 3. Manufacturer's recommendations may be contained in product literature, or by manufacturer's certification of performance.

2.02 PRODUCT SUBSTITUTIONS

- A. Timing:
1. Requests for Substitutions are restricted to before bid opening as stated in Instruction to Bidders.
 2. Requests received after that time may be considered or rejected at discretion of Architect.
 3. Architect will consider request for substitution after commencement of Work only when specified product or construction method cannot:
 - a. Be provided within Contract Time.
 - b. Receive necessary approvals.
 - c. Be provided in manner compatible with or coordinate with other materials.
 - d. Provide required warranty.

B. Conditions:

1. Contractor's substitution request will be received and considered by Architect when following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action except to record noncompliance with these requirements
 - a. Burden of proof of merit of proposed substitution is upon proposer.
 - b. Extensive revisions to Contract Documents are not required.
 - c. Requested substitution is consistent with Contract Documents and will produce indicated results.
 - d. Request is timely, fully documented and properly submitted.
 - e. Request is directly related to "or equal" clause or similar language in Contract Documents.
 - 1) Specified product or construction method cannot be provided within Contract Time.
 - 2) Request will not be considered when product or method cannot be provided as result of failure to pursue Work promptly, failure to identify items requiring long lead times, or failure to coordinate activities properly.
 - f. Specified product or construction method cannot:
 - 1) Receive necessary approval by governing authority, and requested substitution can be approved.
 - 2) Be provided in manner that is compatible with other materials, and where Contractor certifies that requested substitution will overcome incompatibility.
 - 3) Be coordinated with other materials, and where Contractor certifies that requested substitution can be coordinated.
 - 4) Provide warranty required by Contract Documents and where Contractor certifies that requested substitution provide required warranty.
 - g. Substantial advantage is offered Owner, in cost, time, energy conservation, or other considerations of merit, after deducting additional responsibilities Owner must assume.
 - 1) Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner or separate Contractors, and similar considerations.
 - h. When requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of Work, is uniform and consistent, is compatible with other products, and is acceptable to contractors involved.

C. Architects Action:

1. When necessary, within one week of receipt of request for substitution, Architect will request additional information or documentation for evaluation of request for substitution.
2. Within 2 weeks of receipt of request, or one week of receipt of additional information or documentation, whichever is later, Architect will notify Contractor of acceptance or rejection of requested substitution.

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FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

3. Form of Acceptance: Change Order.
 4. Use product specified when Architect cannot make decision on use of proposed Substitution within time allocated.
 5. Architect will not be responsible for locating or securing information which is not included in substantiating data.
 6. Architect's decision of acceptance or rejection of requested substitution is final.
- D. Architect's cost for evaluating substitutions requested by Contractor, including making subsequent revisions to Drawings, Specifications and other resulting documentation, will be paid by Owner with reimbursement from Contractor by deductive change order.
- E. Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data, or Samples that relate to construction activities not complying with Contract Documents does not constitute acceptable or valid request for substitution, nor does it constitute approval.

PART 3 EXECUTION

3.01 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in applications indicated.
1. Anchor each product securely in place, accurately located and aligned with other Work.
 2. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01 6000

Substitution Request Form

Project: _____ Substitution Request Number: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____

Section: _____ Page: _____ Article/Paragraph: _____

Requested Substitution: _____

Manufacturer: _____ Address: _____ Phone No. _____

Trade Name: _____ Model No.: _____

Installer: _____ Address _____ Phone No.: _____

History: New Product 2-5 yrs. old 5-10 yrs. old More than 10 yrs. old

Differences between requested substitution and specified product: _____

Provide Point-by-Point Itemized Comparison of requested substitution with specified product data attached

REQUIRED BY A/E – Comply with Division 01 Specification Section 01 6000.

Reason for not providing specified item: _____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: No Yes; explain _____

Benefit to Owner for accepting substitution: _____ (\$ _____)

Proposed substitution changes Contract Time: No Yes; Add/Deduct _____ days.

Supporting Data Attached (Comply with Division 01 Specification Section 01 6000):

Product Data Drawings Tests Reports Samples _____

Undersigned Certifies:

- Requested substitution has been fully investigated and determined to be equal or superior in every respect to specified product.
 - Same warranty will be furnished for requested substitution as for specified product.
 - Same maintenance service and source of replacement parts, as applicable, is available.
 - Requested substitution will have no adverse affect on other trades, and will not affect or delay Progress Schedule.
 - Cost data as stated above is complete.
 - Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
 - Requested substitution does not affect dimensions and functional clearances.
 - Undersigned will make payment for changes to building design, Including architectural or engineering design, detailing, and construction costs caused by requested substitution.
-

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

Attachments: _____

ARCHITECT'S REVIEW AND ACTION

- Substitution Approved – Make submittals in accordance with Division 01 Specification Section 01 3300.
- Substitution Approved as Noted – Make submittals in accordance with Division 01 Specification Section 01 3300.
- Substitution Rejected – Use specified materials.
- Substitution Request Received Too Late – Use specified materials.

Signed by: _____ Date: _____

Additional Comments: Contractor Subcontractor Supplier Manufacturer A/E _____

SECTION 01 7123
FIELD ENGINEERING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Furnishing services of registered Civil Engineer or licensed Land Surveyor for engineering services required for Project.
 2. Survey work required in execution of Project.
 3. Civil, structural or other professional engineering services specified, or required to execute Contractor's construction methods.
 4. Coordination with testing laboratory and soils engineer.
 5. Contractor furnished assistance.
 6. Verification of conditions.
- B. Related Sections:
1. Section 01 3300: Submittal Procedures
 2. Section 01 7700: Closeout Procedures.
- C. Related Requirements:
1. Refer to District's Division 00 Documents, including General Conditions, for additional requirements.

1.02 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 3300 and following:
1. Name and address of Surveyor or professional engineer to Architect, including changes as they may occur.
 2. Upon request of Architect, provide documentation to verify accuracy of field engineering work.
 3. Include certificate signed by registered Civil Engineer or Land Surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.
- B. Record Drawings:
1. At Project completion, obtain and pay for CD's and Files of Project Plans.
 - a. Clearly indicate differences between original drawings and completed Work within specified tolerances.
 2. Show as-built locations by coordinates of utilities onsite with top of pipe elevations at major grade and alignment changes.
 3. Date, sign and certify completed record drawing transparencies as correct, by Licensed Surveyor or Civil Engineer.
 4. Comply with requirements of Section 01 7700.

1.03 QUALITY ASSURANCE

- A. Qualifications of Surveyor or Engineer:
1. Engage registered Civil Engineer or licensed Land Surveyor acceptable to both Contractor and Owner who is qualified to perform land surveying.

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FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

2. Prior to start of Work, furnish to Owner, name and license (or registration number) issued by State of California, Board of Registration for Professional Engineers and Land Surveyors.
 3. Provide notice to Owner during course of construction should identification of individual responsible for this Work change, and obtain approval of Owner for replacement.
- B. Perform Field Engineering Services furnished during course of this Project under direct supervision and control of named individual civil engineer or land surveyor.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 SURVEY REFERENCE POINTS

- A. Existing horizontal and vertical control points for Project are those designated on Drawings.
- B. Locate and protect control points prior to starting site work, and preserve permanent reference points during construction.
1. Make no changes or relocations without prior written notice to Architect.
 2. Report to Architect when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 3. Identify and protect survey monuments on Project Site discovered during construction, which are not referenced on Project Drawings.
 - a. Tie out such monuments and notify Architect prior to allowing them to be disturbed.
 4. Replace permanent boundary markers disturbed during construction with new permanent monuments and file required Record of Survey or Corner Record in accordance with applicable State and County laws, at no additional cost to Owner.

3.02 PROJECT SURVEY REQUIREMENTS

- A. Establish minimum of two permanent horizontal and vertical control points on Project Site, remote from building area referenced to data established by survey control points.
1. Record locations, with horizontal and vertical data, on Project Record Documents, including description of monuments in place.
- B. Establish lines and levels, locations and dimensions, by instrumentation or similar technical appropriate means:
1. Site Improvements:
 - a. Utility lines, including, but not necessarily limited to, storm drains, sewers, water mains, gas, electric and telephone lines.
 - b. Provide adequate horizontal control to locate lines and provide vertical control in proportion to slope of line as required for accurate construction.
 2. Building Lines and Levels:
 - a. Furnish building corner offsets as required to adequately locate buildings.
 3. Provide control lines and levels required for Mechanical and Electrical work.
 4. Provide grade stakes and elevations as required to construct paved areas, landscaped areas, and other areas as required.

- a. Calculate and layout subgrade elevations and intermediate controls as required to provide smooth transitions between the spot elevations indicated on plans.
 - b. From time to time, verify layout of Work by same methods.
5. Provide batter boards or other similar control for drainage, utility, and other onsite structures as required.

3.03 RECORDS

- A. Maintain complete, accurate surveyor's log of control and survey work as it progresses.
1. Make this log available for reference.

END OF SECTION 01 7123

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FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 01 7329

CUTTING AND PATCHING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Administrative and procedural requirements for cutting and patching.
- B. Related Sections:
 - 1. Section 01 1100: Summary of Work
 - 2. Section 01 7419: Construction Waste Management and Disposal
 - 3. Section 01 7423: Cleaning
- C. Related Requirements:
 - 1. Refer to Divisions 22 and 23 Sections for cutting, patching, of plumbing and mechanical items.
 - 2. Refer to Divisions 26, 27, and 28 Sections for cutting, patching, of electrical and related systems.

1.02 QUALITY ASSURANCE

- A. Requirements for Structural Work:
 - 1. Do not cut and patch structural elements in manner that would reduce their load-carrying capacity or load-deflection ratio.
- B. Operational and Safety Limitations:
 - 1. Do not cut and patch operating elements or safety related components in manner that would result in reducing their capacity to perform as intended or result in increased maintenance or decreased operational life or safety.
 - 2. Obtain approval before cutting and patching following operating elements or safety related systems:
 - a. Shoring, bracing, and sheeting.
 - b. Primary operational systems and equipment.
 - c. Air or smoke barriers.
 - d. Water, moisture, or vapor barriers.
 - e. Membranes and flashings.
 - f. Fire protection systems.
 - g. Noise and vibration control elements and systems.
 - h. Control systems.
 - i. Communication systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
- C. Visual Requirements:
 - 1. Do not cut and patch construction exposed on exterior or in occupied spaces, in manner that would, in Architect's opinion, reduce aesthetic qualities, or result in visual evidence of cutting and patching.
 - 2. Remove and replace Work that has been cut and patched in visually unsatisfactory manner.

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FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

3. Engage recognized experienced and specialized fabricator to cut and patch following categories of exposed Work:
 - a. Processed concrete finishes.
 - b. Portland cement plaster (Stucco).

PART 2 PRODUCTS

2.01 MATERIALS

- A. Use materials that are identical to existing materials.
 1. Where identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to fullest extent possible with regard to visual effect.
 2. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 EXECUTION

3.01 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed.
 1. Take corrective action before proceeding if unsafe or unsatisfactory conditions are encountered.

3.02 PREPARATION

- A. Comply with requirements for temporary protections specified in Section 01 5000.
- B. Temporary Support:
 1. Provide temporary support of Work to be cut.
 2. Review with Structural Engineer when necessary.
- C. Protection:
 1. Protect existing construction during cutting and patching to prevent damage.
 2. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- E. Take precautions necessary to avoid cutting existing pipe, conduit, or ductwork serving building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

- A. General:
 1. Employ skilled workmen to perform cutting and patching.
 2. Proceed with cutting and patching at earliest feasible time and complete without delay.
 3. Cut existing construction to provide for installation of other components or performance of other construction activities and subsequent fitting and patching required to restore surfaces to their original condition.

- B. Cutting:
1. Cut existing construction using methods least likely to damage elements to be retained or adjoining construction.
 2. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping.
 3. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces.
 - a. Temporarily cover openings when not in use.
 4. To avoid marring existing finished surfaces, cut or drill from exposed or finished side into concealed surfaces.
 5. Cut through concrete and masonry using cutting machine such as carborundum saw or diamond core drill.
 6. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned.
 7. Cut-off pipe or conduit in walls or partitions to be removed.
 - a. Cap, valve or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching:
1. Patch with durable seams that are as invisible as possible.
 2. Comply with specified tolerances.
 - a. Where feasible, inspect and test patched areas to demonstrate integrity of installation.
 - b. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in manner that will eliminate evidence of patching and refinishing.

3.04 CLEANING

- A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access.
1. Comply with requirements of Section 01 7423.

END OF SECTION 01 7329

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FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 01 7419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. References.
 - 2. System description for construction and demolition waste management.
 - 3. Submittals.

- B. Related Sections:
 - 1. Section 01 3300: Submittal Procedures.
 - 2. Section 01 4100: Regulatory Requirements.
 - 3. Section 01 5000: Temporary Facilities and Controls.
 - 4. Section 01 7423: Cleaning.
 - 5. Section 01 7700: Closeout Procedures.

1.02 REFERENCES

- A. California Integrated Waste Management Act of 1989 (AB 75).

- B. California Code of Regulations, Title 14 – Natural Resources
 - 1. Division 7 – Department of Resources Recycling and Recovery

1.03 SYSTEM DESCRIPTION

- A. Collection and separation of construction and demolition waste materials generated on-site as follows:
 - 1. Re-use or recycling on-site.
 - 2. Transportation to approved recyclers or re-use organizations.
 - 3. Transportation to legally designated landfills for purpose of recycling, salvaging, or reusing minimum of 50 percent of construction and demolition waste generated.

1.04 SUBMITTALS

- A. Construction and Demolition Waste Management Plan (Exhibit 1):
 - 1. Within 10 calendar days after Notice to Proceed and prior to waste removal, submit following to Owner for review and approval:
 - a. Materials to be recycled, re-used, or salvaged, either on-site or off-site.
 - b. Estimates of construction and demolition waste quantity (in tons) by type of material.
 - 1) When waste is measured by volume, give factors for conversion to weight in tons.
 - c. Procedures for recycling/re-use program.
 - d. Permit or license and location of Project waste disposal areas.
 - e. Site Plan for placement of waste containers.

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FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- B. Construction and Demolition Waste Management Monthly Progress Report (Exhibit 2):
 - 1. Submit Summary of waste generated by Project, monthly with Application for Payment. Include following:
 - a. Firms accepting recovered or waste materials.
 - b. Type and location of accepting facilities (landfill, recovery facility, or used materials yard).
 - 1) When materials are to be re-used or recycled on Project Site, location should be designated as "On-site Re-use/Recycling".
 - c. Type of materials and net weight (tons) of each.
 - d. Value of materials or disposal fee paid.
 - e. Attach weigh bills and other documentation confirming amount and disposal location of waste materials.
- C. Construction and Demolition Waste Management Final Compliance Report:
 - 1. Final update of Waste Management Plan to provide summary of total waste generated by Project.
- D. Waste management Report for Contractors (Exhibit 3):
 - 1. Complete attached form and submit to Owner.
- E. Solid Waste Management and Recycling Plan (Exhibit 4):
 - 1. Complete attached form and submit to Owner.

PART 2 PRODUCTS *(Not Applicable)*

PART 3 EXECUTION

3.01 IMPLEMENTATION

- A. Implement approved Waste Management Plan including collecting, segregating, storing, transporting and documenting each type of waste material generated, recycled or re-used, or disposed in landfills.
- B. Designate on-site person to be responsible for instruction workers and overseeing sorting and recording of waste/recyclable materials.
- C. Include waste management and recycling in worker orientation and as agenda item for regular project meetings.
- D. Limit recycle and waste bin areas to approved areas indicated on Waste Management Plan.
 - 1. Keep recycle and waste bins neat and clearly marked to avoid contamination of materials.

3.02 ATTACHMENTS

- A. Exhibit 1: Construction and Demolition Waste Management Plan.
- B. Exhibit 2: Construction and Demolition Waste Management Monthly Progress Report.
- C. Exhibit 3: Waste Management Report for Contractors.

D. Exhibit 4: Solid Waste Management and Recycling Plan.

END OF SECTION 01 7419

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FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

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EXHIBIT 1

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN

CONSTRUCTION/MAINTENANCE/ALTERATION AND DEMOLITION PROJECTS

PROJECT NAME: _____

PROJECT NO: _____

NAME OF COMPANY:

CONTACT PERSON: _____

TELEPHONE: _____

PROJECT SITE LOCATION: _____

PROJECT TYPE:

___New Construction ___Demolition ___Maintenance/Alteration Projects

PROJECT SIZE (SQ.FT.): _____

DATE AND ESTIMATED PERIOD _____

EXHIBIT 2

**CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT MONTHLY PROGRESS
REPORT**

CONSTRUCTION/MAINTENANCE/ALTERATION AND DEMOLITION PROJECTS

PROJECT NAME: _____

PROJECT NO: _____

NAME OF COMPANY:

CONTACT PERSON: _____

TELEPHONE: _____

PROJECT SITE LOCATION: _____

PROJECT TYPE:

___ New Construction ___ Demolition ___ Maintenance/Alteration Projects

PROJECT SIZE (SQ.FT.): _____

DATE AND ESTIMATED PERIOD: _____

EXHIBIT 3

WASTE MANAGEMENT REPORT FOR CONTRACTORS

Complete this form each time materials are removed from

Project Site or reused onsite.
Submit to Owner's Project Manager.

PROJECT SITE LOCATION: _____ DATE: _____

COMPANY: _____

—

MATERIAL: _____

WAS THE MATERIAL RECYCLED: YES _____ NO _____

VOLUME/WEIGHT: _____

RECYCLING COMPANY OR DISPOSAL
SITE: _____

SUBMITTED
BY: _____

PHONE NUMBER: _____

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FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

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EXHIBIT 4

SOLID WASTE MANAGEMENT AND RECYCLING PLAN

Prepare Waste Management and Recycling Plan by completing the following form for Construction and Demolition materials produced because of Work performed at Citrus Community College District. Owner requires that Contractors recycle materials when there is viable recycling company available.

Owner's Environmental Health and Safety Supervisor will assist applicants in developing and implementing Waste Management and Recycling Plan.

COMPANY NAME: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

PROJECT SITE: _____

Please fill out following form for submittal.
Form will help to identify types of materials, estimated quantities of materials, and how material will be transported and recycled or disposed.

Should you have questions regarding this form or recycling and disposal, please call Jorge Ramirez, Director of Maintenance, at 310.973.1300

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FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

EXHIBIT 4 FORM

Circle the material that will be generated at the construction site, estimate the quantity, list how the materials will be transported, and write in where the materials will be taken.

MATERIALS	ESTIMATED QUANTITY (in yards and tons)	HAULER (List hauler's name if not self-haul)	RECYCLING COMPANY OR DISPOSAL SITE
Salvage and used building			
Wood			
Plant Debris			
Wallboard			
Glass			
Soil			
Corrugated cardboard			
Metals			
Masonry/Tile			
Concrete/Asphalt			
Toilets (porcelain)			
Carpet Padding (foam)			
Other			
Mixed Loads (i.e. trash)			

FOR DISTRICT USE ONLY:

Approval Status:

_____ Approved

_____ Further explanation needed, see attached

_____ Denied

Reviewed by: _____ Date: _____

SECTION 01 7423

CLEANING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Performance of cleaning, during progress of Work, and at completion of Work, as required by General Conditions.
- B. Related Sections:
 - 1. Section 01 5000: Temporary Facilities and Controls; additional requirements for dust and debris control.
 - 2. Section 01 7419: Construction Waste Management and Disposal.
- C. Related Requirements:
 - 1. Refer to District's Division 00 Documents, including General Conditions, for additional requirements.
 - 2. Cleaning for specific products of Work:
 - a. Specification Section for that Work.

1.02 REFERENCES

- A. South Coast Air Quality Management District (SCAQMD):
 - 1. Rule 403 – Fugitive Dust.

1.03 QUALITY ASSURANCE

- A. Verify that requirements of cleanliness are being met.

1.04 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations in compliance with applicable codes, ordinances, regulations, and anti-pollution laws.
 - 1. Comply with requirements of Section 01 7419.
- B. In addition to specified requirements, comply with applicable requirements of fire and governing authorities having jurisdiction.

1.05 PAYMENT WITHHELD

- A. Architect reserves right to withhold certification of payment requests for failure on part of Contractor to regularly clean Project in conformance with requirements of this Section.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS AND EQUIPMENT

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning products manufacturer.

PART 3 EXECUTION

3.01 PROGRESS CLEANING DURING CONSTRUCTION

- A. Execute periodic cleaning to keep Work, Project Site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.
 - 1. Maintain stored items in orderly arrangement allowing maximum access and providing required protection of materials.
 - a. Provide on-site containers for collection of waste materials, debris and rubbish.
 - 2. Provide adequate storage for waste materials awaiting removal from Project Site, observing requirements for fire protection and protection of environment.
 - 3. Handle hazardous, dangerous or unsanitary waste materials separately from other waste material by placing it in proper containers.
 - 4. Burying or burning of waste materials is not permitted.
 - 5. Remove waste materials, debris and rubbish from Project Site periodically and dispose of at legal disposal areas away from Project Site.
- B. Project Site:
 - 1. Inspect Project Site daily and pick up scrap, debris, and waste material.
 - a. Place waste material in designated containers.
 - 2. Keep flammable waste in sealed metal containers until removed from Project Site.
 - 3. Maintain Project Site clear of debris so as not to impede construction and fire department access
- C. Structures:
 - 1. Weekly, and more often if necessary, inspect structures and pick up scrap, debris, and waste material.
 - a. Remove items and place in designated container.
 - 2. Weekly, sweep interior spaces clean.
 - a. Keep space free from dust and other material capable of being removed by handheld broom, (i.e.: "broom clean").
 - 3. Preparatory to installation of succeeding material, clean structures or pertinent portions as required to degree of cleanliness recommended by manufacturer of succeeding material.

4. Following installation of finish floor materials, clean finish floor daily, and more often if necessary.
 - a. Provide adequate protection of finish where Work is being performed in space in which finish materials have been installed.
 - b. For purpose of this subparagraph, term "Clean", is to be interpreted as meaning free from foreign materials that, in opinion of Architect, may be injurious to finish floor material, (i.e.: "vacuum clean").

3.02 DUST CONTROL

- A. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

3.03 FINAL CLEANING

- B. Prior to completion of Work, remove from Project Site, tools, surplus materials, equipment, scrap, debris, and waste.
- C. Employ experienced workers for final cleaning.
- D. Complete following cleaning operations before requesting inspection for Certification of Substantial Completion:
 1. Site:
 - a. Clean Site, including landscape development areas, of rubbish, litter and other foreign substances.
 - b. Sweep paved areas broom clean, including public paved areas directly adjacent to Project Site.
 - 1) Remove stains, spills and other foreign deposits.
 - c. Rake grounds that are neither paved nor planted, to smooth even-textured surface and remove resultant debris.
 2. Exterior and Interior:
 - a. Clean exposed exterior and interior hard-surfaced finishes to dust-free condition
 - b. Remove traces of soils, waste material, smudges and other foreign matter.
 - c. Remove traces of splashed material from adjacent surfaces.
 - d. Remove materials using equipment as instructed by manufacturer of surface materials to be cleaned.
 - e. Leave concrete floors broom clean.
 3. Carpeted Surfaces:
 - a. Use only dry-chemical method of cleaning.
 - b. Do not use steam cleaning or water based cleaning on carpet.
 - c. Use materials and methods fully approved by carpet manufacturer, as instructed in manufacturer's published literature.
 - d. Vacuum carpet.
 4. Labels:
 - a. Remove labels that are not permanent labels.
 5. Transparent Materials:
 - a. Clean transparent material, including mirrors and glass in doors and windows.
 - b. Remove glazing compound and other substances that are noticeable vision obscuring materials.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- c. Replace chipped or broken glass and other damaged transparent materials.
 - d. Restore reflective surfaces to their original reflective condition.
 - e. Clean glass inside and outside.
 - f. Polished Surfaces:
 - 1) Apply polish recommended by manufacturer of material being polished to surfaces requiring routine application of buffed polish.
- E. Ventilating Systems:
- 1. Clean permanent filters and replace disposable filters when units were operated during construction.
 - 2. Clean ducts, blowers and coils when units were operated without filters during construction.
- F. Wipe surfaces of electrical equipment.
- 1. Remove excess lubrication and other substances.
 - 2. Clean plumbing fixtures to sanitary condition.
 - 3. Clean light fixtures and lamps.
- G. Comply with regulations of authorities having jurisdiction and safety standards for cleaning.
- 1. Do not burn waste materials.
 - 2. Do not bury debris or excess materials on Owner's property.
 - 3. Do not discharge volatile, harmful or dangerous materials into drainage systems.
 - 4. Remove waste materials from Project Site and dispose of in lawful manner.
 - 5. Where extra materials of value remaining after completion of associated Work have become Owner's property, arrange for disposition of these materials as directed.
- H. Prior to final completion, or Owner occupancy, conduct inspection of sight-exposed exterior surfaces, and Work areas, to verify that entire Work is clean.

3.04 CLEANING DURING OWNER'S OCCUPANCY

- A. Should Owner occupy portion of Project prior to its final completion by Contractor, comply with acceptance of partial occupancy by Owner/Architect in accordance with General Conditions of the Contract.

END OF SECTION 01 7423

SECTION 01 7700

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements for Project Closeout, including but not necessarily limited to:
 - a. Inspection procedures.
 - b. Substantial Completion
 - c. Final Acceptance
- B. Related Sections:
 - 1. Section 01 7423: Cleaning
 - 2. Section 01 7839: Project Record Documents
- C. Related Requirements:
 - 1. Closeout requirements for specific construction activities are included in appropriate Sections in Divisions 02 through 33.

1.02 BENEFICIAL OCCUPANCY AND ACCEPTANCE OF SUBSTANTIAL COMPLETION

- A. Comply with CCR, Title 24, Part 1 – Administrative Code, Section 4-336 CCR (Schools) Requirements for Closeout Procedures.
 - 1. Comply with additional requirements in District's Division 00 Sections and General Conditions of the Contract.
- B. Preliminary Procedures:
 - 1. Before requesting inspection for certification of Substantial Completion, complete following.
 - a. List exceptions in request.
 - 2. In application for payment that coincides with, or first follows, date Substantial Completion is claimed, show one hundred percent completion for portion of Work claimed as substantially complete.
 - a. Include supporting documents for completion as indicated in Contract documents and statement showing accounting of changes to Contract Sum.
 - b. When one hundred percent completion cannot be shown, include list of incomplete items, value of incomplete construction, and reasons Work is not complete.
 - 3. Make required submittals of specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents, along with record drawings and similar final record information in accordance with requirements in Section 01 7839.
 - 4. Complete final clean up requirements in accordance with Section 01 7423, including touch-up painting.
 - a. Touch-up and otherwise repair and restore marred exposed finishes.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- C. Inspection Procedures:
1. Upon receipt of request for inspection, Architect will either proceed with inspection or advise Contractor of unfilled requirements.
 2. Should Architect and Owner determine that Work is not substantially complete:
 - a. Architect will promptly notify Contractor in writing, giving reason(s) for his determination.
 - b. In conjunction with Inspector of Record and Construction Manager, Architect will prepare list of items (Punch List) to be completed or corrected.
 - 1) Punch List may be developed for less than entire project, when approved by Architect and Owner.
 - c. Remedy deficiencies and notify Architect when Work is ready for reinspection.
 - d. Architect will prepare Certificate of Substantial Completion, accompanied by Punch List, following inspection, or advise Contractor of construction that must be completed or corrected before certificate will be issued
 3. Architect will repeat inspection when requested and if assured that Work has been substantially completed in each phase, will submit Certificate of Substantial Completion to Contractor and Owner for their written acceptance of responsibilities assigned them in Certificate.
 - a. Owner reserves right to occupy each completed phase upon issuance of Certificate of Substantial Completion.
 4. Results of completed inspection will form basis of requirements for final acceptance.
- D. Mandatory Substantial Completion Submittals:
1. To include, but are not necessarily limited to:
 - a. Redlined' As-Built Set (marked up drawings).
 - b. On As-Built Set and Specifications manual record revisions to original contract document with contrasting color.
 - c. Operation and Maintenance Manuals for items specified in pertinent Sections and for other items approved by Architect.
 - d. Warranties and Guarantees.
 - e. Training.
 - f. Spare parts, materials, and extra stock.
 - g. Evidence of payment and release of liens, when requested by Owner.
 - h. List of Subcontractors, service organizations and principal vendors, including current names, addresses and telephone numbers, where they may be contacted for emergency service, including nights, weekends, and holidays.

1.03 FINAL ACCEPTANCE

- A. Preliminary Procedures:
1. Before requesting final inspection for certification of final acceptance and final payment, complete following.
 - a. List exceptions in request.
 2. Prepare and submit Project Closeout Request notice that Work is ready for final inspection and acceptance.
 3. Architect, and Owner's Project Inspector will verify that Punch List items are complete.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

4. Should Architect or Owner's Project Inspector determine Work is incomplete or defective:
 - a. Architect or Owner's Project Inspector will promptly notify Contractor in writing, listing incomplete or defective work.
 - b. Remedy deficiencies promptly and notify Owner's Project Inspector when ready for re-inspection.

- B. Reinspection Procedure:
 1. Architect will reinspect Work upon receipt of notice that Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to Architect.
 2. Upon completion of reinspection, Architect will prepare certificate of final acceptance, or advise Contractor of Work that is incomplete, or of obligations that have not been fulfilled but are required for final acceptance.
 3. When necessary, reinspection will be repeated.
 4. When Architect determines Work is acceptable under Contract Documents, he will notify Owner's Project Inspector that Project is complete per Contract Drawings and Specifications.
 5. Upon acceptance, Contractor must certify that Project has been completed in compliance with Contract Documents.
 - a. Submit copies of this report to following:
 - 1) Architect.
 - 2) Owner's Project Inspector.

- C. Final Payment Procedure.
 1. Submit following in accordance with requirements of Section 01 7839:
 - a. Final payment request with releases and supporting documentation not previously submitted and accepted.
 - b. Include certificates of insurance for products and completed operations where required.
 2. Updated final statement, accounting for final additional changes to Contract Sum.
 3. Certified copy of Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and list has been endorsed and dated by Architect.
 4. Consent of surety to final payment.
 5. Comply with additional requirements in District's Division 00 Sections and General Conditions of the Contract.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 7700

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 01 7839

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements for preparing, maintaining, and submitting following:
 - a. Project Record Documents.
 - b. Operating and Maintenance Data and Manuals.
 - c. Warranties, Guarantees, and Bonds.
 - d. Spare parts and Maintenance Materials.
 - e. Instructions to Owner's Personnel.

- B. Related Sections:
 - 1. Section 01 7700: Closeout Procedures

- C. Related Requirements:
 - 1. Refer to District's Division 00 Documents, including General Conditions, for additional requirements.
 - 2. Separate Specification Sections requiring Record Documents.

1.02 PROJECT RECORD DOCUMENTS

- A. Dedicated Record Set:
 - 1. Maintain one set of Contract Drawings and one copy of Project Specifications for use during construction to record changes made during construction..
 - a. Record revisions with contrasting color.
 - b. Do not use record documents for construction purposes.

- B. Record Documents and Shop Drawings:
 - 1. Record in concise and neat manner and on continual basis actual revisions to Work.
 - 2. Include reference to appropriate document with date revision/change was approved or directed.
 - 3. Changes/Revisions to Drawings and Specifications include, but are not necessarily limited to:
 - a. Changes made by RFI, CCD, and CO.
 - b. Changes made to shop drawings.
 - 4. Mark set to show actual installation where installation varies substantially from Work as originally shown.
 - a. Mark whichever drawing is most capable of showing conditions fully and accurately.
 - b. Where shop drawings are used, record cross-reference at corresponding location on Contract drawings.
 - c. Give particular attention to concealed elements that would be difficult to measure and record at later date.
 - 5. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of Work.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

6. Mark new information that is important to Owner, but was not shown on Contract Drawings or shop drawings.
 7. Note related Change Order numbers where applicable.
 8. Label each document "**PROJECT RECORD**" in neat large printed letters.
 9. Record information concurrently with construction progress.
 - a. Do not conceal Work until required information is recorded.
 10. Legibly mark each item to record actual construction including:
 - a. Measured depths of foundations in relation to finish first floor datum.
 - b. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 1) Identify drains and sewers by invert elevation.
 - c. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of Work.
 - d. Identify ducts, dampers, valves, access doors and control equipment wiring.
 - e. Field changes of dimension and detail.
 - f. Details not on original Drawings.
- C. Store Record Documents and Samples in Contractor's Field Office, separate from documents used for construction.
1. Protect record documents from deterioration and loss in secure, fire-resistive location.
 2. Provide access to record documents for Architect's reference during normal working hours.
 3. Provide files and racks for storage of Documents
 4. Provide secure storage space for storage of samples.
 5. Maintain documents in clean, dry, legible condition and in good order.
 - a. Replace soiled or illegible documents.
- D. Record Specifications:
1. Maintain one complete copy of Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction.
 2. Legibly mark these documents and record at each product section description of actual products installed to show substantial variations in actual Work performed in comparison with text of specifications and modifications including following:
 - a. Manufacturer's name, trade name, product model and number and supplier.
 - b. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation, including following:
 - 1) Authorized product substitutions or alternates utilized.
 - 2) Changes made by Addenda and Modifications.
 3. Note related record drawing information and product data.
 4. Upon completion of Work, submit record specifications to Architect for Owner's records.
- E. Owner's Project Inspector will verify that Project Record Documents are fully updated prior to approving Payment Applications.
1. Obtain Owner's Inspector's signature on record set verifying information.
- F. Record drawings will be reviewed by Architect for completeness and acceptance.

- G. As-Built Drawings:
1. Turn over to Owner in following manner:
 - a. Separate each discipline (i.e. Civil, Architectural, Mechanical, Electrical, Plumbing, and so on)
 - b. Identify disciplines of Drawings by adding white tag.
 - c. Tag each discipline.
 - d. Tag Size: No. 8, 8-11/16 by 2-3/4 inches.
 - e. Legibly write on tag name of Project, and discipline inside tube.
 - f. Separately tube each discipline by using U-Line tube or equal.
 - g. Size of Tube: 4 inches minimum and 6 inches maximum.
- H. Record of Electronic (Digital) Files:
1. Immediately before inspection of Substantial Completion, review marked-up Record Set with Architect and Owner's Inspector.
 2. When authorized, prepare full set of corrected digital files of Record Documents.
 3. Submit following documents:
 - a. Scan sheets in As-Built Set, furnish annotated PDF electronic files.
 - b. CD or CD's of PDF files and file labeling is to include following information:
 - 1) Project name.
 - 2) Date.
 - 3) Name of Architect.
 - 4) Name of Contractor
 - 5) Disciplines included in CD (i.e. Title sheet, Civil, Architectural, Structural, Mechanical, and so on)
 - 6) Label and index files contained in CD in sequential order to match Title Sheet of Contract Documents.
- I. RFI's:
1. Furnish one copy of RFI's questions and answers submitted on Project.
 2. Submit RFI binder in following manner:
 - a. Provide binders as specified in "Record Document Storage" Article.
 - b. Label binder on cover and spine: RFI's.
 - 1) Identify Project Name/Building Name, and Project Number on cover.
 - c. Furnish tab for each individual RFI.
 - d. Submit RFI Binders inside storage boxes as specified in "Record Document Storage" Article.
 - 1) Include two labels on face and side of box or boxes.

1.03 MAINTENANCE AND OPERATING (M&O) DATA AND MANUALS

- A. Submit two sets prior to Substantial Completion inspection for Architect's review and approval.
- B. Manual Format:
1. Prepare data in form of instructional manual for use by Owner's personnel.
 - a. Provide binders as specified in "Record Document Storage" Article.
 - b. Identify Project Name/Building Name and Project Number on cover of manual.
 2. Table of Contents: Include in each volume, neatly typewritten.
 - a. Identify Contractor, name of responsible principal, address, and phone number.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- b. List each product included, indexed to content of volume.
 - c. List, with each product, name, address, and telephone number of subcontractor or installer and maintenance contractor, as appropriate and nearest source of supply for parts and replacement.
 - d. Identify location of installed equipment.
 - e. Submit M&O Manuals inside storage boxes as specified in "Record Document Storage" Article.
3. Product Data:
 - a. Include only those sheets which are pertinent to specific product.
 - b. Annotate each sheet to clearly identify specific product or part installed.
 - c. Include CD with Product Data information.
 - 1) Maintenance schedules and equipment list must be in editable Word or Excel spreadsheet format.
 4. Drawings:
 - a. Supplement product data with Drawings as necessary to clearly illustrate relations of component parts of equipment and systems.
 - b. Coordinate Drawings with information in Project Record Documents to ensure correct illustration of completed installation.
 - c. Do not use Project Record Documents as maintenance drawings.
 - d. Full size and half size hard copies of Drawings are required.
 5. Copy of each warranty and service contract as specified.

1.04 RECORD DOCUMENT STORAGE

- A. Binders:
 1. Commercial quality, heavy-duty, three-ring D binders with durable and cleanable vinyl-covers at front and spine, with internal pockets to hold CD.
 2. Size: 8-1/2 by 11 inches with ring size as required.
 3. Provide new white binders.
- B. Storage Boxes:
 1. "Bankers Box" or equal quality.
 - a. Size: 11 by 15 inches or equal size.
 2. Include two labels on face and side of box.
 3. Label boxes as follows:
 - a. Use Avery Label 6573 or equal size.
 - b. Type information on label, including Bid No., Project Name, and Number of boxes (i.e. Box 1 of 5).
 - 1) Refer to attached sample label at end of this Section.
 - 2) Font for Labels:
 - a) Vernada, 48 point for Bid No.
 - b) Vernada, 16 point for remainder of content on label.

1.05 WARRANTIES, GUARANTEES, AND BONDS

- A. Disclaimers and Limitations:
 1. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on Work that incorporates products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with Contractor.

- B. Manufacturer's warranties and guarantees notwithstanding, warrant entire Work against defects in materials and workmanship for twelve months from Date of Acceptance of Substantial Completion.
 - 1. Warranties and guarantees between Contractor and Owner are not affected by warranties and guarantees between Contractor and manufacturers and Contractor and suppliers.

1.06 WARRANTY REQUIREMENTS

- A. Related Damages and Losses:
 - 1. When correcting warranted Work that has failed, remove and replace other Work that has been damaged as result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty:
 - 1. When Work covered by warranty has failed and been corrected by replacement or rebuilding, reinstate warranty by written endorsement.
 - 2. Provide Reinstated Warranty equal to original warranty with equitable adjustment for depreciation.
- C. Replacement Cost:
 - 1. Upon determination that Work covered by warranty has failed, replace or rebuild Work to acceptable condition complying with requirements of Contract Documents.
 - 2. Contractor is responsible for cost of replacing or rebuilding defective Work regardless of whether Owner has benefited from use of Work through portion of its anticipated useful service life.
- D. Owner's Recourse:
 - 1. Written warranties made to Owner are in addition to implied warranties, and do not limit duties, obligations, right and remedies otherwise available under law, nor are warranty periods be interpreted as limitations on time in which Owner can enforce such other duties, obligations, rights, or remedies.
 - 2. Rejection of Warranties:
 - a. Owner reserves right to reject warranties and to limit selections to products with warranties not in conflict with requirements of Contract Documents.
- E. Owner reserves right to refuse to accept Work for Project where special warranty, certification, or similar commitment is required on such Work or part of Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- F. Submit warranties and guarantees to Contractor for Architect's review and approval prior to final payment.
- G. Do not start warranty period for delayed warranty items, until items have been completed.
- H. Furnish two original copies with wet signatures of warranties and guarantees on Project.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- I. Organize warranties/guarantees into orderly sequence based on Table of Contents in Project Specifications:
 1. Bind warranties/guarantees in 8-1/2 by 11 inch heavy-duty, three ring binders, same as specified in "Maintenance And Operating (M&O) Data and Manuals" Article.
 2. Identify each binder on front and spine with printed sheet "**WARRANTIES**", project name and name of contractor.
 3. Contractor to issue Contractor's and Subcontractor's Warranties/Guarantees using attached Warranties/Guarantees form found at end of this Section.

1.07 SUBMITTALS

- A. Submit written warranties to Architect prior to date certified for Substantial Completion.
 1. When Architect's Certificate of Substantial Completion designates commencement date for warranties other than date of Substantial Completion for Work, or designated portion of Work, submit written warranties upon request of Architect.

1.08 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit (2) copies of final approved manual to Owner's Project Inspector prior to final payment.
- B. Content for each unit of mechanical equipment and each mechanical system, as applicable and appropriate, including but not limited to following:
 1. Description of units, or system and component parts.
 2. Operating procedures.
 3. Maintenance procedures.
 4. Servicing and lubrication schedule, with list of lubricants required.
 5. As-installed control diagrams by controls manufacturer.
 6. Other data as required in various specification sections.
- C. Content, for each electrical and electronic system, as applicable and appropriate, including but not limited to following:
 1. Description of system and component parts.
 2. Circuit directories of panel boards.
 3. As-installed color-coded wiring diagrams.
 4. Operating procedures.
 5. Maintenance procedures.
 6. Other data as required in individual sections.
- D. Prepare and include additional data as may be required for instruction of Owner's personnel.
- E. Additional requirements for operating and maintenance data: As may be specified in individual Sections.
- F. Provide complete information for products specified in individual Sections.

1.09 INSTRUCTION OF OWNER'S PERSONNEL

- A. Provide instruction/training to Owner personnel as indicated in individual specification sections and as required.
- B. Provide to Owner, date and list, including signatures, of Owner personnel who attended training.
 - 1. Schedule instructional meeting or meetings after instructional manuals have been submitted, reviewed, and approved by Architect.
 - 2. Coordinate meetings to include tier subcontractors.
- C. Instruction sessions will be held in Owner designated area on Project Site and at Owner's convenience.
 - 1. Schedule amount of time required for each session as specified in individual sections.
- D. Review contents of Manuals with Owner's personnel in full detail to explain every aspect of operation and maintenance.

1.10 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual Sections.

PART 2 PRODUCTS *(Not Applicable)*

PART 3 EXECUTION *(Not Applicable)*

END OF SECTION 01 7839

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

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WARRANTY/GUARANTEE FORM

FOR _____ WORK

We, the undersigned, do hereby warranty and guaranty that the parts of the Work described above which we have furnished or installed for:

Project Name: (Insert Project Name)

Owner: (Insert Owner's Name)

Location: (Insert Project Location)

Are in accordance with the Contract Documents and that all said work as installed with fulfill or exceed all the Warranty and Guaranty requirements. We agree to repair or replace work installed by us, together with any other work which is displaced or damaged by so doing, that proves to be defective in workmanship, material, or operation within a period of:

(Insert written years) year(s)

from the date of filing of the Notice of Completion, ordinary wear and tear and unusual neglect or abuse excepted.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the Owner, after notification in writing, we, the undersigned, all collectively and separately, hereby authorize the Owner to have said defective work repaired and/or replaced and made good, and agree to pay to the Owner upon demand all monies that the Owner may expend in making good said defective work, including all collection costs and reasonable attorney fees.

Date:

(Insert Name of Contractor)

(Insert Name of Subcontractor, Manufacturer or Supplier)

Signature:

Signature:

Name: Name:

Title: Title:

State License No.

State License No.:

Local Representative: For maintenance, repair, or replacement service, contact:

Name:

Address:

Phone:

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

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Bid No. XXXX

[Project Name]

DSA No. N/A

RFI BINDERS 01 OF 04

BINDERS 01 OF 04: RFI'S 001 THRU 050

BINDERS 02 OF 04: RFI'S 051 THRU 100

BINDERS 03 OF 04: RFI'S 101 THRU 150

BINDERS 04 OF 04: RFI'S 151 THRU 200

Box 1 of 5

SAMPLE

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 02 4113

SELECTIVE SITE DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Furnishing labor, materials and equipment necessary for selective site demolition, dismantling, cutting, and alterations as indicated, specified, or required for completion of Work.
 2. General items, including but not necessarily limited to following:
 - a. Protection of existing improvements to remain.
 - b. Protection of existing trees and vegetation to remain.
 - c. Cleaning existing improvements to remain.
 - d. Removing debris, waste materials, and equipment.
 - e. Removal of items for performance of Work.
 - f. Salvageable items to be retained by Owner.
 3. Selective Site Demolition Work:
 - a. Consisting of, but not necessarily limited to, Work as indicated on Drawings:
 - 1) Removal of existing underground utilities.
 - a) Including disconnecting and capping off when required.
 - 2) Removal of existing above grade site improvements:
 - a) Asphalt and concrete paving.
 - b) Landscape and irrigation system.
 4. Photographic Documentation:
 - a. Prior to commencement of Work, provide photographic documentation showing existing conditions of Site, structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations.
 - b. Perform photography in coordination with Project Inspector and Owner's Representative.
 - c. Furnish digital copies to Project Inspector and Owner.
- B. Related Sections:
1. Section 01 1100: Summary of Work.
 2. Section 01 5000: Temporary Facilities and Controls; additional traffic control and other protection procedures.
 3. Section 01 5713: Temporary Erosion and Sediment Control.
 4. Section 01 7419: Construction Waste Management and Disposal.
 5. Section 02 4116: Building Demolition
 6. Section 02 4119: Selective Building Demolition
 7. Section 02 4120: Selective Interior Demolition
 8. Section 31 0000: Earthwork
 9. Section 32 8400: Planting Irrigation
- C. Related Requirements:
1. Refer to respective Sections of Divisions 21 through 23, and 26 through 28, and respective Demolition Drawings for cutting, patching, removing, or relocating plumbing, HVAC, and electrical items.

1.02 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate items to be salvaged or items to be protected during demolition.
 - 2. Indicate locations of utility terminations and extent of abandoned lines to be removed.
 - a. Include details indicating methods and location of utility terminations.

1.03 QUALITY ASSURANCE

- A. Prior to commencement of Work, schedule walkthrough with Owner's Authorized Representative and Architect to confirm Owner property items have been removed from scheduled Work areas.
 - 1. Identify and mark remaining property items and schedule their removal.
 - 2. Review limits of demolition and items indicated on shop drawings.
 - 3. Perform Work of this Section by employing workers skilled in demolition of site improvements, under Contractor's full time direct supervision.
- B. Coordinate demolition for correct sequence, limits, and methods.
 - 1. Schedule demolition Work to create least possible inconvenience to public and facility operations.

1.04 PROJECT CONDITIONS

- A. Drawings may not indicate in detail entire demolition Work to be performed.
 - 1. Examine existing conditions to determine full extent of required demolition.
 - 2. Existence and location of underground utility pipes or structures shown are obtained by search of available records.
 - a. Contractor is required to take due precautionary measures to protect utilities shown and other lines or structures not shown
 - b. Design Professional is not responsible for location of underground utilities or structures whether or not shown on and installed by Contract Documents.
 - c. It is Contractor's responsibility to examine conditions before commencing operations.
 - 1) Should unidentified conditions or conditions that vary from those indicated, be encountered, promptly notify Architect for clarification before proceeding
 - 3. Immediately notify Owner and Architect, should such unidentified conditions be discovered.
- B. Repair damage to existing improvements or damage due to excessive demolition.
- C. Provide necessary measures to avoid excessive damage from inadequate or improper means and methods, improper shoring, bracing or support.
- D. Comply with requirements of Section 01 5000 and additional protections specified in other Division 02 Sections

PART 2 PRODUCTS

2.01 HANDLING OF MATERIALS

- A. Storage or sale of removed items on Project Site will not be permitted.

PART 3 EXECUTION

3.01 GENERAL

- A. Protection:
 - 1. Provide safeguards, including, but not necessarily limited to, safety partitions, warning signs, lights, barricades, and other forms of protection for protection of workers, occupants, and public, are installed.
 - a. Comply with requirements of Section 01 5000.
- B. When safety of existing construction appears to be endangered, take immediate measures to correct such conditions.
 - 1. Cease operations and immediately notify Architect and Owner.

3.02 SELECTIVE SITE DEMOLITION PROCEDURES

- A. General:
 - 1. Remove existing construction only to extent necessary for proper installation of new Work and interfacing with existing construction.
 - 2. Cut back finished surfaces to straight, plumb or level lines as required for smooth transition.
 - 3. Where openings are cut oversize or in improper locations, replace or repair to required condition.
- B. Concrete and Asphalt (Bituminous) Surfacing Removal:
 - 1. Break up and completely remove following existing items:
 - a. Existing concrete surfacing, curbs, gutters, and walks.
 - b. Bituminous (asphalt) surfacing to indicated limits.
 - 2. Perform cutting to neat and even line with proper tools or concrete cutting saw.
 - a. Minimum Depth of Cut: 1-1/2 inches, unless otherwise indicated
- C. Remove concrete and asphalt pavement broken beyond indicated limits to nearest joint or score line and replace with new paving to match existing.

3.03 CUTTING EXISTING CONCRETE

- A. Engage skilled workers familiar with requirements and space necessary for placing concrete to perform cutting of existing concrete.
 - 1. Perform concrete cutting with concrete cutting wheels and hand chisels.
 - 2. Do not damage concrete intended to remain.
- B. Cutting of Non-Structural Concrete:
 - 1. As indicated or as reviewed by Architect.
 - 2. Replace concrete demolished in excess of amounts indicated.
 - 3. Prior to cutting or coring concrete, determine locations of hidden utilities or other existing improvements and provide necessary measures to protect them from damage.

3.04 REMOVAL OF EXISTING UTILITY SERVICES

- A. Plumbing:
 - 1. Remove existing below grade plumbing services as indicated on Drawings.
 - a. Cap off existing piping to remain as indicated and specified.

2. Coordinate with requirements specified in Division 22 Sections.
- B. Electrical:
1. Remove existing electrical equipment fixtures and services not indicated for reuse and not necessary for completion of Work.
 2. Remove abandoned conduit and cap unused portions of existing conduit.

3.05 REMOVAL OF OTHER MATERIALS

- A. Remove existing improvements not specifically indicated or required but necessary to perform Work.
1. Cut to clean lines, allowing for installation of Work.
- B. Remove existing lawn sprinkler lines and fittings.
1. Cut back to existing lines to remain and cap.
 2. Coordinate with specified requirements under landscape irrigation Section and as indicated on Landscape Drawings.

3.06 PATCHING

- A. Patch or repair materials to remain when damaged by performance of this Work.
1. Provide finish material and appearance of patch or repair Work matching existing.

3.07 CLEANING

- A. Conform to requirements specified in Section 01 7423 and as follows:
1. Clean existing materials to remain with appropriate tools and equipment.
 2. Protect existing improvements during cleaning operations.
 3. Dampen debris by fog water spray prior to transporting by truck.
 4. Keep debris pick-up area broom-clean and washed daily with clean water.
 5. Continuously clean up and remove items as demolition Work progresses.

3.08 REMOVAL AND DISPOSAL

- A. Remove waste and debris, other than items to be salvaged.
1. Turn over salvaged items to Owner, or store and protect for reuse where required.
- B. Remove and legally dispose of rubbish, debris, and waste materials off Project Site.
1. Comply with requirements of Section 01 7419
 2. Fill and compact excavations in accordance with Section 31 0000.

END OF SECTION 02 4113

SECTION 02 4120

SELECTIVE INTERIOR DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Furnishing labor, materials and equipment necessary for performance of selective interior demolition as indicated, specified, or required.
 2. Selective removal and subsequent relocation/reinstallation or legal off-site disposal of, but not necessarily limited to following:
 - a. Existing ceramic floor and wall tile.
 - b. Existing gypsum board partition.
 - c. Existing non-compliant signage
 - d. Existing toilet accessories to be relocated.
 - e. Existing floor-mounted water closet to be relocated.
 - f. Saw cutting of existing concrete slab for installation of new plumbing waste line for relocated water closet,
 - 1) Includes patch and repair of concrete slab as indicated on Drawings.
 3. Coordinate removal from Project Site of debris removed by other trades.
- B. Related Sections:
1. Section 01 1100: Summary of Work
 2. Section 01 4100: Regulatory Requirements; current Code edition.
 3. Section 01 5000: Temporary Facilities and Controls; temporary protections.
 4. Section 01 7329: Cutting and Patching
 5. Section 02 4113: Selective Site Demolition

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, current edition:
1. Part 2, California Building Code (CBC), Volumes 1 and 2:
 - a. CBC Chapter 33 – Safeguards During Construction,
 2. Part 9, California Fire Code (CFC):
 - a. CFC Chapter 33 – Fire Safety During Construction and Demolition.

1.03 DEFINITIONS

- A. Remove:
1. Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain Owner's property.
- B. Remove and Salvage:
1. Items indicated to be removed and salvaged remain Owner's property.
 2. Remove, clean, and pack or crate items to protect against damage.
 3. Identify contents of containers and deliver to Owner's designated storage area.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- C. Partial Removal:
 - 1. Items of salvable value to Contractor may be removed from structure as Work progresses.
 - 2. Salvaged items must be transported from Project Site as they are removed.
 - 3. Storage or sale of removed items on Project Site will not be permitted.
- D. Remove and Reinstall:
 - 1. Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage.
 - 2. Reinstall items in same locations or in locations indicated.
- E. Existing to Remain:
 - 1. Protect construction indicated to remain against damage and soiling during selective demolition.
 - 2. When permitted by Architect, items may be removed to suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.04 SUBMITTALS

- A. Prior to cutting which affects structural safety, submit written request to Architect for permission to proceed with cutting.
- B. Shop Drawings:
 - 1. Indicating following:
 - a. Extent of items and systems to be removed.
 - b. Items to be salvaged or items to be protected during demolition.
 - c. locations of utility terminations and extent of abandoned lines to be removed.
 - 1) Include details indicating methods and location of utility terminations.
- C. Schedule of Removal:
 - 1. Indicate elements to be demolished and removed and proposed timing for Work.
 - 2. Coordinate with Work of other trades.
- D. Record Drawings:
 - 1. Identify and accurately locate capped utilities and other subsurface structural, plumbing, mechanical, or electrical conditions.

1.05 QUALITY ASSURANCE

- A. Demolition Firm Qualifications:
 - 1. Engage experienced firm that has successfully completed selective demolition work similar to that indicated for this Project.
- B. Pre-Demolition Conference:
 - 1. Conduct conference at Project Site to comply with Pre-Installation Conference requirements of Section 01 3119.
 - 2. Conduct walkthrough with Owner's Project Representative to confirm Owner property items have been removed from scheduled Work areas.

3. Identify and mark remaining property items and schedule their removal and delivery to Owner.
- C. Coordination:
1. Coordinate demolition for correct limits and methods.
 2. Schedule demolition work to minimize inconvenience to public, and Owner's facility operations.

1.06 PROJECT CONDITIONS

- A. Occupancy:
1. Owner will occupy portions of campus immediately adjacent to areas of selective demolition.
 2. Conduct selective demolition Work in manner that will minimize need for disruption of Owner's normal operations.
 3. Provide minimum of 48 hour advance notice to Owner of demolition activities that will affect Owner's normal operation.
- B. Protections:
1. Ensure safety of Contractor, Owner personnel, and general public.
 2. Institute measures designed to avoid physical harm to public or property damage to facilities from inadequate or improper means and methods; improper shoring, bracing and structural support; or poorly fenced off areas.
- C. Traffic:
1. Conduct demolition operations and debris removal in manner to ensure minimum interference with occupied or used facilities.
 2. Do not close, block or otherwise occupied or used facilities without written permission from authorities having jurisdiction.
 3. Provide alternate routes around closed or obstructed traffic ways where required by governing regulations.
- D. Drawings may not indicate in detail Demolition Work to be performed.
1. Examine existing conditions to determine full extent of required demolition.
 2. When conditions are encountered that vary from those indicated, promptly notify Architect for direction or clarification before proceeding.
- E. Condition of Structures:
1. Owner assumes no responsibility for actual condition of items or structures to be demolished.
 2. Conditions existing at time of contractor inspection for bidding purposes will be maintained by Owner insofar as practicable.
 3. Minor variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.
- F. Asbestos or Hazardous Waste:
1. It is understood and agreed that this contract does not contemplate handling of asbestos or hazardous waste material.
 2. Should asbestos or other hazardous waste material be encountered, notify Owner immediately.
 3. Do not disturb, handle or attempt to remove.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- G. Damages:
1. Promptly repair damages caused to adjacent facilities by demolition Work.
 2. Repair damage to existing improvements or damage due to excessive demolition.

1.07 REGULATORY REQUIREMENTS

- A. Intent of Drawings and Specifications is that Work of selective demolition is to be in accordance with CCR, Title 24.
1. Should existing conditions such as deterioration or non-compliant construction be discovered which is not covered by Contract Documents, and finished Work will not comply with CCR, Title 24:
 - a. Architect will submit Construction Change Document (CCD) - *DSA Form 140*, or separate set of plans and specifications, detailing and specifying required Work to, and approved by Division of the State Architect before proceeding with Work.
 2. Comply with CCR Title 24, Part 2 - CBC, and Part 9 - CFC, Article 87 – “Fire Safety During Construction, Alteration or Demolition of a Building.”
 3. Comply with governing EPA notification regulations before starting selective demolition Work.
 4. Comply with requirements of Section 01 5000 and hauling and disposal regulations of authorities having jurisdiction.

1.08 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials become Contractor's property and are to be removed from Project Site.

PART 2 PRODUCTS

2.01 HANDLING OF MATERIALS

- A. Deliver items scheduled for salvage by Owner to location designated by Owner.
1. Clean, package and label Items for storage.
- B. Store items scheduled for reuse on Project Site.
1. Secure from theft, and protected from damage, and other deleterious conditions.
- C. District is responsible for removal and testing of materials suspected of asbestos or lead contamination.
1. Asbestos abatement reports are available from District.
 2. Cease material removal and alert District immediately when suspect materials are discovered.

2.02 PRODUCTS FOR PATCHING, EXTENDING AND MATCHING

- A. Provide same products or types of construction as that in existing structure, as needed to patch, extend or match existing Work.
1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to fullest extent possible.

2. Use materials whose installed performance equals or surpasses that of existing materials.
 3. Generally Contract Documents will not define products or standards of workmanship present in existing construction
 4. Determine products by inspection and necessary testing, and workmanship by use of existing as sample of comparison.
- B. Presence of product, finish, or type of construction, requires that patching, extending, or matching, be performed as necessary to make Work complete and consistent to identical standards of quality.

PART 3 EXECUTION

3.01 GENERAL

- A. Preparation:
1. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain.
 2. Provide safeguards, including warning signs, lights and barricades, for Owner and protection of workers, occupants, and public and to ensure safe passage of people around selective demolition area.
 3. Erect temporary protection, complying with requirements where required, by authorities having jurisdiction.
 4. Protect walls, ceilings, floors, and other existing finish work that are to remain and are exposed during selective demolition operations.
- B. Protection:
1. Always have fully charged, portable fire extinguisher with each demolition crew on-site.

3.02 EXAMINATION

- A. Examine existing conditions, including elements subject to movement or damage during remodeling work.
- B. After uncovering Work, examine conditions affecting installation of new work.
- C. Discrepancies:
1. Where uncovered conditions are not as anticipated, immediately notify Architect and secure needed directions.
 2. Do not proceed in areas of discrepancy until such discrepancies have been fully resolved.
- D. Time extensions or increase or decrease of costs resulting from such changes will be adjusted in manner provided in General Conditions.

3.03 POLLUTION CONTROLS

- A. Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt.
1. Comply with governing environmental protection regulations.
 2. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as flooding and pollution.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- B. Remove and transport debris in manner that will prevent spillage on adjacent surfaces and areas.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.
 - 1. Return adjacent areas to condition existing before start of selective demolition.

3.04 SELECTIVE INTERIOR DEMOLITION – GENERAL

- A. Adhere to Project Schedule and notify Owner of changes to Schedule imposed by unforeseen site conditions or Owner operational activities.
- B. Perform selective demolition in systematic manner.
 - 1. Use such methods as required to complete Work indicated in accordance with Project Schedule and governing regulations.
- C. Remove existing construction only to extent necessary for proper installation of new work and interfacing with existing construction.
 - 1. Cut back finished surfaces to straight, plumb or level lines as required for smooth transition.
 - 2. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.
 - a. Do not throw or drop materials.

3.05 REMOVAL OF EXISTING PLUMBING EQUIPMENT AND SERVICES

- A. Remove existing plumbing fixtures (floor-mounted water closet) indicated for relocation.
 - 1. Cap unused portions of active waste lines.
 - 2. Comply with additional requirements indicated on Drawings.

3.06 REMOVAL OF OTHER MATERIALS

- A. Woodwork:
 - 1. Cut or remove to joint or panel line.
- B. Modular Materials:
 - 1. Ceramic Tile:
 - a. Remove to extent indicated without leaving damaged or defective Work where joining new construction.
- C. Gypsum Board:
 - 1. Remove to extent indicated or required.
 - a. Preferably to panel joint line on stud or support line when possible.
- D. Remove existing improvements not specifically indicated or required but necessary to perform new Work.
 - 1. Cut to clean lines, allowing for installation of new Work.

3.07 PATCHING

- A. Patch or repair materials to remain when damaged by performance of this Work.
 - 1. Finish material and appearance of patch or repair Work to match existing.

3.08 CLEANING

- A. Clean existing materials to remain with appropriate tools and equipment.
- B. Protect existing improvements during cleaning operations.
- C. Dampen debris by fog water spray prior to transporting by truck.
- D. Keep debris pick-up area broom clean:
 - 1. Wash daily with clean water.
- E. Remove waste and debris, other than items to be salvaged.
 - 1. Turn over salvaged items to Owner, or store and protect for reuse where required.
- F. Continuously clean up and remove items as Work progresses and legally dispose of off Project Site.
 - 1. Comply with additional requirements in Sections 01 7419 and 01 7423.

END OF SECTION 02 4120

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 05 5000

METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Miscellaneous metal fabrications as shown.
 - a. Includes items fabricated from iron and steel shapes, plates, and bars which are not part of other metal systems specified elsewhere.
 2. Work includes, but is not necessarily limited to:
 - a. Anchor bolts, not specified elsewhere.
 - b. Miscellaneous steel framing and supports, not specified elsewhere.
 - c. Steel pipe handrails and railing systems
 3. Finishes
- B. Related Sections:
1. Section 01 4100: Regulatory Requirements; current Coded Edition.
 2. Section 03 3000: Cast-in-Place Concrete: footings for railings.
- C. Related Requirements:
1. Items furnished, but not installed under this Section:
 - a. Inserts and Anchorages:
 - 1) Furnish inserts and anchoring devices which must be set in concrete for installation of sign and stair support framing.
 - b. Provide setting drawings, templates, instructions and directions for installation of anchorage devices.
 - c. Coordinate delivery with other work to avoid delay.

1.02 REFERENCES

- A. California Code of Regulations, Title 24, California Building Code (CBC), Part 2, Volumes 1 and 2, current edition,
1. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.
- B. ASTM International (ASTM):
1. ASTM A 36 – Standard Specification for Carbon Structural Steel
 2. ASTM A 53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
 3. ASTM A 123 – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 4. ASTM A 500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
 5. ASTM A 780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
 6. ASTM C 1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
- C. American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI):

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

1. ASCE/SEI 7– Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- D. American Welding Society (AWS):
 1. AWS D1.1 – Structural Welding Code – Steel.
 2. AWS QC1 – Standard for AWS Certification of Welding Inspectors.
- E. American Institute of Steel Construction (AISC):
 1. AISC 360 – Specification for Structural Steel Buildings.
- F. American Iron and Steel Institute (AISI):
 1. AISI S100 – North American Specification for the Design of Cold-Formed Steel Structural Members.
- G. American Galvanizers Association, Inc. (AGA):
 1. AGA - Inspection of Hot-Dip Galvanized Steel Products
- H. The Society for Protective Coatings (SSPC):
 1. SSPC-SP 1 – Solvent Cleaning.
 2. SSPC-SP 2 – Hand Tool Cleaning.
 3. SSPC-SP 3 – Power Tool Cleaning.
 4. SSPC-SP 6 – Commercial Blast Cleaning.
 - a. Shop preparation only.
 5. SSPC-SP 11 – Power Tool Clean to Bare Metal
 - a. Field preparation only for welds and damaged shop primer.

1.03 SUBMITTALS

- A. Product Data:
 1. Manufacturer's specifications, anchor details, and installation instructions for products to be used in fabrication of miscellaneous metal, including paint products.
 - a. Manufacturer's Information:
 - 1) Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying coating material proposed for use.
- B. Shop Drawings:
 1. For fabrication and erection of miscellaneous metal assemblies.
 - a. Include plans and elevations at not less than 1/2 inch to 1 foot scale.
 - b. Provide large scale construction details of various parts, including, but not necessarily limited to:
 - 1) Methods of joining.
 - 2) Thickness of metals.
 - 3) Profiles of surfaces.
 - 4) Reinforcing, anchorage, and accessory items.
 - c. Include details of sections and connections at not less than 3 inch to 1 foot scale.
 2. Include information regarding concealed and exposed joints, welds, and fastenings.
 3. Provide templates for anchor or bolt installation by others.

1.04 QUALITY ASSURANCE

- A. Design Criteria:
 - 1. Design Work to support normally imposed loads and conform to AISC, AISI, and ASCE/SEI 7 requirements.
- B. Standards:
 - 1. Conform to applicable provisions and performance referenced standards where indicated.
- C. Field Measurements:
 - 1. Take field measurements prior to preparation of shop drawings and fabrication, where possible.
 - 2. Do not delay job progress; allow for trimming and fitting wherever taking field measurements before fabrication might delay Work.
- D. Qualifications:
 - 1. Fabricator Qualifications:
 - a. Successfully engaged for minimum of 5 years in manufacture of metal fabrications work, similar to that specified and indicated for this Project.
 - b. Fabricator qualifications are subject to Owner and Project Inspector's review and approval before subcontract is awarded.
 - 2. Qualifications for Welding Work:
 - a. Qualify welding procedures and welding operators in compliance with AWS Qualification requirements of AWS D1.1.
 - b. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, when pertinent, has undergone recertification.
 - c. When recertification of welders is required, retesting will be Contractor's responsibility.
 - 3. Welding Inspector Qualifications:
 - a. Welding Inspectors:
 - 1) Trained and thoroughly experienced in inspecting welding operations.
 - 2) Qualified as Certified Welding Inspectors (CWI) in accordance with AWS D1.1, AWS D1.2, AWS D1.3, and AWS QC1.
 - 4. Welder Qualifications:
 - a. Qualify welders, welding operators, and tackers in accordance with AWS D1.1.
- E. Shop Assembly:
 - 1. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly.
 - 2. Disassemble units only as necessary for shipping and handling limitations.
 - 3. Clearly mark units for reassembly and coordinated installation.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle packaged materials in original containers with seals unbroken and labels intact until time of use.
- B. Discharge materials carefully and store on clean concrete surface or raised platform in safe, dry area.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- C. Electrode Requirements:
 - 1. Package weld filler metals conforming to requirements of AWS D.1.1.
 - a. FCAW Electrodes: Received in undamaged moisture-resistant containers.
 - b. Protect electrodes against contamination and injury during shipment and storage.
 - c. When removed from protective packaging and installed on machines, take care to protect electrodes and coatings from deterioration or damage.

1.06 PROJECT CONDITIONS

- A. Scheduling and Sequencing:
 - 1. Ensure timely fabrication of items to be embedded or enclosed by other Work.
 - 2. Furnish information and assistance required for locating embedded items and be responsible for proper locations.

1.07 WARRANTY

- A. Pipe Railing Warranty:
 - 1. Manufacturer's standard warranty, agreeing to repair or replace components of pipe railings that fail in materials or workmanship within specified warranty period.
 - a. Failures include, but are not necessarily limited to:
 - 1) Structural failures.
 - 2) Deterioration of metals, metal finishes, and other materials, beyond normal weathering.
 - b. Warranty Periods:
 - 1) Two years.
 - 2) Five-year finish warranty for railings scheduled to receive high performance coating specified in Section 09 9600.

PART 2 PRODUCTS

2.01 MATERIALS AND COMPONENTS – GENERAL

- A. Welding Electrodes and Filler Metal:
 - 1. Carbon Steel:
 - a. Use electrodes recommended by AWS.
- B. Fasteners:
 - 1. Use fasteners made of same basic metal as fastened metal, unless otherwise indicated.
 - a. Do not use metals which are corrosive or incompatible with materials joined.
 - b. Do not use exposed fasteners except where unavoidable.
 - 1) Match finish of metal surrounding fastener.
 - 2. Provide Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.
 - 3. Select fasteners for type, grade and class required.
 - 4. Steel Bolts and Nuts:
 - a. Regular hexagon head type, ASTM A 307, Grade A; with hex nuts.
 - 5. Lag Bolts:

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- a. Square head type
 - 1) Conforming to ASME B 18.2.1
 6. Machine Screws:
 - a. Cadmium plated steel
 - 1) Conforming to ASME B 18.6.3
 7. Wood Screws:
 - a. Flat head carbon steel
 - 1) Conforming to ASME B 18.6.1
 8. Plain Washers:
 - a. Round, carbon steel
 - 1) Conforming to ASME B 18.21.1
 9. Lock Washers:
 - a. Helical spring type carbon steel
 - 1) Conforming to ASME B 18.21.1
 10. Expansion Bolts:
 - a. Concrete Anchorage:
 - 1) Hilti Kwik Bolt TZ2
 - a) Conforming to ICC ESR-4266
 - b. Masonry Anchorage:
 - 1) Hilti Kwik Bolt TZ2
 - a) Conforming to ICC ESR-4561
- C. Anchors and Inserts:
1. Furnish inserts for setting in concrete and provide other anchoring devices as required for installation of fabricated metal items.
- D. Nonshrink Nonmetallic Grout:
1. Factory premixed, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.
 - a. Minimum Compressive Strength at 28 days:
 - 1) Plastic: 7,500 psi
 - 2) Flowable: 6,200 psi
 - 3) Fluid: 5,800 psi
 2. Provide one of following or grout specifically recommended by manufacturer for types of applications indicated:
 - a. Masterflow 713 Plus; BASF Building Systems
 - b. Sealtight 588 Grout; W.R. Meadows
 - c. Five Star Grout; Five Star Products, Inc.
 - d. SikaGrout 212; Sika Corporation.
- E. Galvanizing:
1. Provide zinc coating for those items shown or specified to be galvanized, as follows:
 - a. Conform to ASTM A 123:
 - 1) For galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8 inch thick and heavier.
 - 2) For galvanizing assembled steel products.
 - b. Conform to ASTM A 153:
 - 1) For galvanizing iron and steel hardware.
 2. Perform galvanizing after fabrication with Work assembled in as large sections as can be handled.
 3. Remove projections, barbs, and icicles after galvanizing.
 4. Galvanizing Repair Paint:

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- a. Organic zinc rich paint complying with ASTM A 780 or SSPC-Paint 20, with dry film containing not less than 94 percent zinc dust by weight.
 5. Do not galvanize exposed steel and components indicated or specified to receive zinc-rich primer and high-performance paint system.
- F. Isolation Between Dissimilar Materials:
1. Provide single-component, inert-type non-corrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
 - a. VOC compliant.
 2. Elasto-Deck BT as manufactured by Pacific Polymers, Division of Holcim Solutions and Products US., or equivalent product acceptable to Architect.
- G. Joint Sealant:
1. Comply with requirements of Section 07 9200 and following.
 - a. Nonsag, nonstaining, silicone sealant complying with ASTM C 920.
 - b. Of type and grade required to seal joints in formed metal
 - c. As recommended in writing by formed metal manufacturer or fabricator.

2.02 FABRICATION – GENERAL

- A. Fabricate items to comply with requirements indicated, including those for quality, thickness and finish of material as well as those indicating dimensions and details.
1. Use heavier metal gages, stiffeners or metal backing as required to produce surface flatness, free of "oil-canning", and to impart sufficient strength for use indicated.
 2. When not otherwise indicated, provide following minimum thickness of metal and comply with SMACNA recommendations for fabrication and installation details:
 - a. Sheet Steel: 16 gage.
 - b. Galvanized Sheet Steel: 16 gage.
 3. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support.
 4. Use type of materials shown or specified for various components of Work.
- B. Use hot-rolled steel bars for work fabricated from bar stock, unless shown or specified to be fabricated from cold-finished or cold-rolled stock.
- C. Supply as part of this Section, miscellaneous small parts of material thinner than 10 gage, or items specifically called out, when such supply is normal and accepted part of Work.
- D. Continuously weld joints and seams except where other methods of joining are indicated
1. Grind welds smooth and flush on exposed surfaces.
 2. Comply with AWS recommendations.
 3. Use filler metals and welding procedures which will blend with and match color of sheet metal being joined and will avoid discoloration at welds.
- E. Provide type of anchorage shown.
1. Coordinate with supporting structure.
 2. Fabricate and space anchoring devices as shown and as required to provide adequate support for intended use.

- F. Cut, reinforce, drill and tap miscellaneous metal work as required to receive finish hardware and similar items.
- G. Fabricate joints which will be exposed to weather in manner to exclude water or provide weep holes where water may accumulate.
- H. Welding Procedures:
 - 1. Procedures are to:
 - a. Assign responsibility to person or position.
 - b. Contain enough detail to be useful to workforce without reference to governing specifications.
 - c. Be dated and indicate person or position that has authority to maintain procedure.
 - 2. Welding Procedure Specifications (WPS):
 - a. Conform to requirements of AWS D1.1.
 - b. Submit Welding Procedure Specifications (WPS) and Procedure Qualification Records (PQR) as required by AWS D1.1, to be used on Project to Owner's Testing Agency.
 - 1) Owner's Testing Agency will review and approve WPS.
 - 2) Use forms provided in Annex E of AWS D1.1 or equivalent.
 - 3. Procedures need not act as work instructions.
 - 4. Weld Sequence Procedures:
 - a. Submit written procedures indicating field welding sequences for each type of connection with multiple field-welded joints, and sequence of such connections to be field-welded at each level.
 - 5. Weld Shrinkage and Distortion Control Plan:
 - a. Where shrinkage is likely to cause distortion or other problems, submit mitigation plan.
 - b. Contractor is responsible for determining conditions requiring Weld Shrinkage and Distortion Control Plan.

2.03 FABRICATION – MISCELLANEOUS METAL

- A. Manufacture or fabricate items to sizes, shapes and dimensions required.
 - 1. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.
- B. Miscellaneous Framing and Supports:
 - 1. Provide miscellaneous steel framing and supports which are not part of structural steel framework, as required to complete Work.
 - 2. Fabricate miscellaneous units to sizes, shapes and profiles shown or, where not shown, of required dimensions to receive adjacent other work to be retained by framing.
 - 3. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection.
 - 4. Cut, drill and tap units to receive hardware and similar items.
 - 5. Equip units with integrally welded anchor straps for casting into poured concrete or building into masonry wherever required.
 - 6. Except as otherwise shown, space anchors 24 inches on center and provide minimum anchor units of 1-1/4 by 1/4 by 8 inch steel straps.

2.04 FABRICATION – STEEL PIPE HANDRAIL AND RAILING SYSTEM

- A. Fabricate pipe handrails and railing systems to dimensions and details shown, with smooth bends and welded joints ground smooth and flush.
1. Comply with requirements of CBC Section 11B-505 and as indicated for design, finish, member sizes, including wall thickness of pipe, post spacing, and anchorage, but not less than that required to support structural loads.
 2. Handrail Gripping Surfaces:
 - a. Make continuous along their length.
 - b. Do not allow handrails to be obstructed along their tops or sides.
 - c. Do not permit bottom of handrail gripping surface to be obstructed for more than 20 percent of its length.
 - d. Provide gripping surfaces and adjacent surfaces free of sharp or abrasive elements.
 - e. Extend gripping surfaces beyond and in same direction of ramp run in accordance with CBC Section 11B-505.10.
 3. Railings:
 - a. Use nominal 1-1/4 inch N.P.S. (1.660 inch O.D.) Schedule 40 steel pipe for railings.
 - b. Use heavy weight 1-1/4 inch N.P.S. (1.660 inch O.D.) Schedule 80 steel pipe for posts.
 - c. Where modifications to existing railings are made, use pipe size matching existing.
 4. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
 - a. At tee and cross intersections, cope ends of intersecting members to fit contour of pipe to which end is joined, and weld all around.
 - b. Form changes in direction of handrails and rails by welding in prefabricated flush elbow fittings.
 - c. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
- B. Brackets, Flanges, Fittings, and Anchors:
1. Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnections of pipe and attachment of handrails and railing systems to other work.
 2. Furnish inserts and other anchorage devices for connecting handrails and railing systems to concrete work.
 3. Close exposed ends of pipe by welding 3/16 inch thick steel plate in place or with prefabricated fittings, except where clearance of end of pipe and adjoining wall surface is 1/4 inch or less.
- C. Accessories for Steel Handrails and Railing Systems:
1. General:
 - a. Provide miscellaneous ferrous metal fittings, including flanges, end closures, and anchors for interconnections of pipe, and attachment of handrails to other work.
 - 1) Provide galvanized ferrous metal fittings, brackets, fasteners, and sleeves for use with galvanized railing systems.
 - 2) Provide non-galvanized ferrous metal fittings, brackets, and fasteners for railings specified to be shop primed and field painted.

- b. Provide inserts and other anchorage devices for connecting handrails and railing systems to concrete or masonry construction.
 - 1) Galvanize anchors embedded in concrete or masonry construction.
 - 2. Close exposed ends of pipe by welding 3/16 inch thick steel plate in place or with prefabricated fittings, except where clearance of end of pipe and adjoining wall surface is 1/4 inch or less.
 - 3. Wall Brackets:
 - a. Provide wall brackets for anchoring handrails to wall.
 - 1) Mill finish steel.
 - a) Field paint after installation to match handrail.
 - b) Galvanized finish to match galvanized handrail.
 - b. Projection from Wall: 2-1/2 inches
 - c. Mounting:
 - 1) Three countersunk flat head wood screws.
 - a) Provide with galvanized expansion sleeves for anchoring in concrete and masonry. construction
 - 2) Secure railings in fittings to prevent rotation of railing.
 - d. Product and Manufacturer:
 - 1) Model RB14025 by Wagner Companies, or approved equal.
- D. Post Sleeves:
- 1. Provide galvanized steel sleeves as detailed, for anchoring railing posts in concrete.
 - 2. Apply specified isolation material to exterior of pipe sleeves.
- E. Modifications to Existing Railing System:
- 1. Make modifications to existing railings as required to make railings compliant with accessibility requirements.
 - 2. Refer to details as indicated on Drawings.

2.05 FINISHES

- A. Comply with NAAMM Metal Finishes Manual for recommendations relative to application and designations of finishes, as applicable.
- 1. Protect mechanical finishes on exposed surfaces by application of strippable, temporary protective covering prior to shipment.
 - 2. Variations in appearance of abutting or adjacent pieces are not acceptable when they are within 1/2 of range of approved samples.
 - a. Noticeable variations in same piece are not acceptable.
 - b. Variations in appearance of other components are acceptable when they are within range of approved samples and are assembled or installed to minimize contrast.
 - 3. Apply heavy coat of specified isolation material to metal surfaces in contact with concrete or dissimilar materials.
 - a. Do not apply on exposed surfaces.
- B. Preparations of Surfaces:
- 1. Thoroughly clean mill scale, rust, dirt, grease, and other foreign matter from ferrous metal prior to galvanizing.
 - 2. Where hand cleaning methods are not adequate, clean in accordance with SSPC SP 1, SSPC SP 2, SSPC SP 3, or SSPC SP 6, as required.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

3. Completely eliminate burrs, rough spots and pitting from normally exposed ferrous metal items.
- C. Galvanized Finish:
1. Where specified, galvanize items after fabrication.
 2. Conform to requirements for galvanizing as specified in "Materials and Components" Article.
 3. Where galvanizing is removed by assembly procedures, touch up abraded areas with zinc-rich paint.
 4. Unless noted otherwise, galvanize exposed fasteners required to secure items to in-place construction.
 5. Galvanize items that will be concealed in final construction or embedded in concrete or masonry construction.
 6. Do not galvanize items indicated or specified to receive organic zinc-rich epoxy shop primer.

2.06 STRUCTURAL PERFORMANCE REQUIREMENTS

- A. Steel Handrails and Railing Systems:
1. Apply each load to produce maximum stress in each of respective components of each metal fabrication.
 - a. Comply with ASCE/SEI 7.
 2. Designed to resist concentrated load of 200 lbf applied vertically downward and horizontally in perpendicular direction at any point on top rail.
 3. Uniform load of 50 lbf per linear foot applied in any direction.
 4. Concentrated and uniform loads above are not to be assumed to act concurrently.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive Work and verify that setting conditions and dimensions are correct to receive items.
1. Do not start installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Field Measurements:
1. Perform sheet metal work in cooperation with other trades.
 2. Where possible, verify size, location and placement of miscellaneous sheet metal work prior to fabrication.
 3. Coordinate field measurements and shop drawings with fabrication and shop assembly.
- B. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete construction.
1. Coordinate delivery of such items to Project Site.

3.03 INSTALLATION – GENERAL

- A. Cutting and Fitting:
1. Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications.
 2. Fit exposed connections accurately together to form tight hairline joints.
 3. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations.
 4. Grind joints smooth and touch-up shop paint coat.
 5. Do not weld, cut or abrade surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
- B. Placement:
1. Set Work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
 2. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
 3. Galvanize exposed fasteners to secure to in-place construction.
 4. Fasten work tightly to prevent rattle or vibration.
 5. Do not tighten fasteners through finish alone without spacer washers.
 6. Use nonshrink grout mixed in accordance with manufacturer's direction for setting frames, plates, sills, bolts and similar items.
 7. Locate and place sheet metal items plumb, level and in alignment with adjacent work.
 8. Tolerances:
 - a. Offset from true horizontal, vertical and design location:
 - 1) Not to exceed 1/16 inch in 10 feet of length for any component, non-cumulative.
 - b. Maximum offset from true alignment between abutting components:
 - 1) Not to exceed 1/32 inch.
- C. Use concealed anchorages where possible.
1. Provide brass or lead washers fitted to screws where required to protect sheet metal surfaces.
 2. Provide concealed gaskets, flashing, sealants and fillers and install as Work progresses to make installations weathertight or sealed.
- D. Form tight joints with exposed connections accurately fitted together.
1. Provide reveals and openings for sealants and joint fillers, as indicated.
- E. Protect non-ferrous metal surfaces from corrosion or galvanic action by application of heavy coating of specified isolation coating material on concealed contact surfaces of dissimilar materials, before assembly and installation, where there is possibility of corrosive or electrolytic action.
- F. Field Welding:
1. Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

3.04 INSTALLATION –PIPE RAILING AND HANDRAILS

- A. Adjust railings prior to anchoring to ensure matching alignment at butting joints.
 - 1. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
 - 2. Space posts not more than 8 feet on centers, unless otherwise shown.
 - 3. Plumb posts in each direction.

- B. Secure posts and rail ends to building construction as follows:
 - 1. Anchor posts in concrete by means of pipe sleeves set and anchored into concrete.
 - a. Provide sleeves of galvanized, standard weight, steel pipe, not less than 6 inches long, and having inside diameter not less than 1/2 inch greater than outside diameter of inserted pipe post.
 - b. Provide steel plate secured to bottom of sleeve of width and length not less than 1 inch greater than outside diameter of sleeve.
 - 1) After posts have been inserted into sleeves, fill annular space between post and sleeve solid with specified non-shrink grout.
 - 2) Cover anchorage joint with round steel flange welded to post.
 - 2. Anchor rail ends into concrete with round steel flanges welded to rail ends and anchored into wall construction with expansion shields and bolts.

3.05 FIELD PAINTING AND TOUCH-UP

- A. Repair of Galvanized Surfaces:
 - 1. Repair areas damaged by welding, cutting or during handling, transport or erection in accordance with ASTM A 780 by application of multiple coats of galvanizing repair paint, to dry film thickness of 8 mils.

- B. Repair of Finished Surfaces:
 - 1. Repair finishes damaged by cutting, welding, soldering and grinding operations required for shop fitting and jointing.
 - 2. Restore finishes so that there is no evidence of corrective work.
 - 3. Return items which cannot be refinished in field to shop, make required alterations, and refinish entire unit or provide new units, at fabricator's option.

3.06 CLEANING

- A. Remove protective devices only when items will be safe from other construction operations or removal is required to permit related Work.

3.07 PROTECTION

- A. Protect metal work from damage to surface, profile, and shape.

END OF SECTION 05 5000

SECTION 06 1053

MISCELLANEOUS CARPENTRY

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Carpentry work not specified elsewhere and generally intended for support of other work.
 - 2. Wood framing and furring.
 - 3. Miscellaneous blocking, grounds, and nailers.

- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 09 2900: Gypsum Board

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition.

- B. ASTM International (ASTM):
 - 1. ASTM F 1667 – Standard Specification for Driven Fasteners, Nails, Spikes, and Staples.

- C. National Institute of Standards and Technology (NIST):
 - 1. Voluntary Product Standard PS 1 – Structural Plywood.
 - 2. Voluntary Product Standard PS 20 – American Softwood Lumber Standard

- D. APA – The Engineered Wood Association (APA):
 - 1. E30 – Engineered Wood Construction Guide
 - 2. E445 - PRP-108 – Performance Standards and Qualification Policy for Structural-Use Panels.

- E. West Coast Lumber Inspection Bureau (WCLIB):
 - 1. Standard Grading Rules No. 17, current edition.

- F. Western Wood Products Association (WWPA):
 - 1. Standard Grading Rules for Western Lumber.

- G. American Wood Preservers Association Standards (AWPA):
 - 1. AWPA Use Category System.
 - a. AWPA Use Category UC3 Above Ground (Exterior).
 - b. AWPA Use Category UCF Fire Retardant.
 - 1) AWPA UCFB Fire Retardant Exterior – for wood and wood-based materials intended for fire protection and used in exterior construction that is not in contact with the ground or with foundations.

- H. UL, LLC (UL):
 - 1. Fire Hazard Classification – FR-S

1.03 SUBMITTALS

- A. Wood Treatment Data:
 - 1. General:
 - a. Obtain from chemical treatment manufacturer.
 - b. Include chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated material:
 - 2. Fire-Retardant Treatment:
 - a. Include certification by treating plant that treated wood complies with specified requirements.
 - 3. Include warranty of chemical treatment manufacturer for each type of treatment.

1.04 QUALITY ASSURANCE

- A. Wood Product Quality Standards:
 - 1. Lumber Standards:
 - a. Comply with West Coast Lumber Inspection Bureau (WCLIB).
 - 2. Plywood Standard:
 - a. Comply with Voluntary Product Standard PS 1.
 - 3. Factory-mark each piece of lumber and plywood with type, grade, mill and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.
- B. Single-Source Responsibility for Fire Retardant Treated Wood:
 - 1. Obtain each type of fire-retardant-treated wood product from one source and by single producer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Storage:
 - 1. Keep materials under cover and dry.
 - 2. Protect against exposure to weather and contact with damp or wet surfaces.
 - 3. Stack material above ground level on uniformly spaced supports to prevent deformation.
 - 4. For material pressure treated with waterborne chemicals, place spacers between each bundle for air circulation.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Maintain uniform moisture content of lumber at not more than 19 percent before, during, and after installation.

1.07 SEQUENCING

- A. Sequencing and Scheduling:
 - 1. Coordinate details with other Work supporting, adjoining or fastening to miscellaneous carpentry Work.
- B. Coordination:
 - 1. Fit carpentry work to other work; scribe and cope as required for accurate fit.

2. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.
3. Cooperate with other trades, especially concrete, and metal fabrications to prevent duplication of rough hardware furnished.

PART 2 PRODUCTS

2.01 LUMBER – GENERAL

- A. Standards:
 1. Furnish lumber manufactured to comply with PS 20 – American Softwood Lumber Standard, with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Grade Stamps:
 1. Furnish lumber with each piece factory marked with grade stamp of inspection agency that indicates grading agency, grade, species, moisture content at time of surfacing, and mill.
- C. Sizes:
 1. Provide nominal sizes indicated, complying with PS 20, except where actual sizes are specifically noted as being required.
- D. Surfacing:
 1. Dressed lumber, S4S, unless otherwise indicated.
- E. Framing Lumber:
 1. Comply with WCLIB – Standard No. 17.
 2. Stress grades and wood species as noted on Structural Drawings.

2.02 DIMENSION LUMBER FOR CONCEALED CONDITIONS

- A. Species: Wood species listed by PS 20.
- B. Moisture Content: S-DRY, KD 19 or MC 19 (19 percent maximum moisture content).
- C. Grade: No.2, or standard grade.
- D. Grade: No.3, or utility grade.

2.03 PLYWOOD

- A. Identify each panel with appropriate trademark of APA.
 1. Meet requirements of latest edition of NIST Voluntary Product Standard PS 1 and Voluntary Product Standard PS 2
- B. Panel Size, Thickness, and Grade:
 1. At least equal to that indicated.

2.04 FASTENERS

- A. Nails, Wire, Brads, and Staples:
 1. Conforming to ASTM F 1667.

- B. Screws:
 - 1. Select material, type, size, and finish required for each use.
 - 2. Comply with ASME B18.6.1 for applicable requirements.
- C. Bolts:
 - 1. Conforming to ASTM A 307, Grade A.
 - 2. With hex nuts and flat washers conforming to ASTM A 563.

2.05 FIRE-RETARDANT TREATMENT BY PRESSURE PROCESS

- A. Identify treated wood with appropriate classification marking of Underwriters Laboratories, Inc., or other testing and inspection agency acceptable to authorities having jurisdiction.
- B. Dimension Lumber:
 - 1. Comply with AWPA C20.
 - 2. Treatment Types:
 - a. Interior Type A for protected wood.
- C. Plywood:
 - 1. Comply with AWPA C27.
 - 2. Treatment Types: Interior Type A for protected wood.
- D. Inspect each piece after drying and discard damaged or defective pieces.

PART 3 EXECUTION

3.01 INSTALLATION – GENERAL

- A. Discard units of material with defects that impair quality of miscellaneous carpentry and in sizes that would require excessive number or poor arrangement of joints.
- B. Cut and fit miscellaneous carpentry accurately.
 - 1. Install members plumb and true to line and level.
- C. Coat cut edges of preservative-treated wood to comply with AWPA M4.
- D. Securely fasten miscellaneous carpentry as indicated and according to applicable codes and recognized standards.
- E. Countersink nail heads on exposed carpentry work and fill holes.
- F. Use fasteners of appropriate type and length.
 - 1. Pre-drill members when necessary to avoid splitting wood.

3.02 WOOD GROUNDS, NAILERS, AND BLOCKING

- A. Install where shown and where required for screeding or attachment of other work.
 - 1. Cut and shape to required size.
 - 2. Coordinate location with other work involved.
- B. Attach to substrates as required to support applied loading.
 - 1. Countersink bolts and nuts flush with surfaces, unless otherwise indicated.

3.03 WOOD FURRING

- A. Install at spacing indicated, with closure strips at edges and openings.
 - 1. Shim with wood as required for tolerance of finished Work.

- B. Furring to Receive Plywood Paneling:
 - 1. Install 1 by 3 inch furring at 2 feet on center, horizontally and vertically.
 - 2. Select furring strips for freedom from knots that could cause bent-over nails and damage to paneling.

- C. Furring to Receive Gypsum Board:
 - 1. Install 1 by 2 inch furring at 16 inches on center, vertically.

END OF SECTION 06 1053

PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT

SECTION 07 9200

JOINT SEALANTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Joint sealants required to seal exterior and interior joints to make construction watertight.
- B. Related Sections:
 - 1. Section 09 3000: Tile.
- C. Related Requirements:
 - 1. Refer to Division 22 Sections for plumbing work requiring sealant for use in damp or wet areas.

1.02 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM C 920 – Standard Specification for Elastomeric Joint Sealants.
 - 2. ASTM C 1193 – Standard Guide for Use of Joint Sealants.
- B. South Coast Air Quality Management District (SCAQMD):
 - 1. Rule 1168 – Adhesive and Sealant Applications

1.03 SUBMITTALS

- A. Product Data:
 - 1. Technical data sheets on sealants, primers and cleaning agents, including procedures for priming and cleaning
 - 2. Furnish following from each sealant manufacturer for sealants to be used on Project:
 - a. Product recommendations, including sealant, primer, cleaners, backup and bond breaker
 - b. Certification that recommended sealant and related materials meet requirements of this Section
 - c. Approval of Contractor's sealant joint details
 - d. Certification that installed materials will perform satisfactorily when applied in accordance with the manufacturer's applications instructions and Contractor's details
- B. Shop Drawings:
 - 1. Details of each joint type, for each combination of materials and each installation condition, based on recommendations of manufacturer.
 - 2. Indicate following:
 - a. Proposed joint size for each condition, designed to accommodate specified tolerances, building movements and deflections
 - b. Details of dual lines of sealant, indicating vent/weep tube location, zone dams and bridge seals where required.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- C. Samples:
 - 1. Minimum of four, 3 inch long samples of following”
 - a. Sealant: Each type of sealant exposed to view for material and color required (except black).
 - b. Backer Rod and Bond Breaker Tape: each type, for material and color.
- D. Compatibility Tests:
 - 1. Results of each compatibility test to Architect and Contractor for approval prior to start of sealant Work.

1.04 QUALITY ASSURANCE

- A. Use only qualified workers thoroughly skilled and specially trained in techniques of installing sealant, who can acceptably demonstrate to Architect their ability to fill joints solidly and neatly.
- B. Compatibility Tests:
 - 1. Prior to start of sealant Work, conduct compatibility tests of sealant for each different sealing condition and substrate for entire Project performed by sealant manufacturer and sealant installer.
- C. Pre-Installation Meeting:
 - 1. Arrange meeting when sealant contractor and sealant manufacturers have been selected, but prior to award of contracts.
 - 2. Schedule meeting with Owner and General Contractor
 - a. Arrange for attendance by sealant contractor and sealant manufacturer’s technical representatives
 - 3. Meeting to include, but not limited to, following:
 - a. Review of preliminary test results on sealants.
 - b. Details of sealant joints.
 - c. Sealant application instruction and training of installers.
 - d. Scheduling and procedures for periodic field inspections by sealant manufacturers' technical representatives.
 - 4. Record minutes of meeting and promptly distribute copies of minutes to attendees and other interested parties as may be necessary.
 - a. Include Architect in distribution of meeting minutes.
 - 5. Record issues resolved during meeting.
 - a. Include copies of Drawings and application instructions used in meeting.
 - b. Record changes on Drawings and application instructions made at meeting.
- D. Pre-installation Field Testing:
 - 1. Field test adhesion of joint sealant material to Project substrates.
 - 2. Verify joint sealant materials will satisfactorily adhere to substrates.
 - 3. Arrange field testing with manufacturer or designated representative.
 - 4. Notify parties minimum 7 days prior to field testing.
 - 5. Field test sealants in accordance with ASTM C 1193, Appendix X-1, Method A – “Field Applied Sealant Joint Hand-pull Tab” in compliance with manufacturer's recommendations.

- E. Quality Control Documentation:
 - 1. Establish and administer written procedure for documenting sealant Work, including:
 - a. Log in each shipment of sealant received, by lot number and date received
 - b. Record dates and results of field tests specified in Article 3.04 C
 - c. Log out each lot of sealant installed or rejected, and its ultimate location in Work, when installed.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project Site in original unopened containers bearing manufacturer's name, product designation, date of manufacturer and mixing instructions.

1.06 WARRANTY

- A. Warrant sealants against loss of adhesion, loss of cohesion, cracking, or discoloration for period of twenty years; include labor and material to replace defective sealant

PART 2 PRODUCTS

2.01 MATERIALS

- A. Sealant Standards – General:
 - 1. Elastomeric Sealant: Manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated, complying with requirements of ASTM C 920, including those referenced for Type, Grade, and Class.
- B. Silicone Sealant:
 - 1. Silicone construction sealant, certified by manufacturer to meet following criteria:
 - a. Has physical properties required for both structural and non-structural uses under installed conditions
 - b. Has appropriate movement capability for installation conditions
 - c. Is suitable for interior and exterior application in joint conditions shown
 - d. Will produce watertight bond and watertight joints
 - e. Is compatible with other materials which sealant will contact
 - 2. Primer, backup, and bond breaker-products recommended by sealant manufacturer
 - a. Primer is required unless manufacturer's installation instructions specifically advise to contrary for certain materials
 - 3. Sealant manufacturer is to recommend use of products which will perform satisfactorily under installation conditions on Work.
 - a. Product recommendation is to include sealant, primer, backup, bond breaker, surface preparation, installation methods, and evaluation of tests performed under Article 3.04 A
- C. Sealant for Paving Joints:
 - 1. Self-leveling polyurethane, pouring grade, for gun application.
 - 2. Suitable for traffic service
 - 3. Primer, backup, and bond breaker-products recommended by manufacturer

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- D. Compatibility:
1. Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- E. VOC Content of Interior Sealants:
1. Provide sealants and sealant primers for use inside building envelope that comply with following limits for VOC content complying with SCAQMD Rule 1168:
 - a. Architectural Sealants: Not more than 250 g/L.
 - b. Sealant Primers for Nonporous Substrates: Not more than 250 g/L.
 - c. Sealant Primers for Porous Substrates: Not more than 775 g/L
- F. Colors:
1. Provide colors as scheduled or selected by Architect for various combinations of materials which form joints.
 2. Provide transparent sealant where specified
- G. **Sealant No. 1:**
1. Silicone rubber based, one-part, low-modulus, non-acid curing sealant; Type S, Grade NS, Class 100/50.
 2. Provide one of following product:
 - a. DOWSIL 795 by Dow Performance Silicones.
 - b. GE Silpruf SCS2700 by Momentive Performance Materials, Inc.
 - c. Pecora 890NST by Pecora Corporation.
 - d. Sikasil WS-290 by Sika Corporation.
 3. Apply Sealant No.1 to following exterior joints:
 - a. Joints between cast-in-place concrete sections
 - b. Vertical expansion and control joints
 - c. Horizontal ceiling/soffit joints
 - d. Other exterior joints
 4. Apply Sealant No. 1 to following interior joints:
 - a. Under door thresholds
 - b. Vertical expansion and control joints
 - c. Horizontal ceiling/soffit joints
- H. **Sealant No. 2:**
1. Two-Component Polyurethane Sealant:
 - a. Type M, Grade P, Class 25.
 2. Provide one of following products:
 - a. Pacific Polymers Elasto-Thane 227/227R by ITW Polymers Sealants North America, Inc.
 - b. MasterSeal SL 2 Sealant by BASF Corporation, Construction Systems
 - c. DynaTred by Pecora, Corporation.
 - d. Sikaflex-2c SL by Sika Corporation
 - 1) Exterior and interior non-vehicular traffic joints
 - e. Sikaflex-2c NS TG by Sika Corporation
 - 1) Exterior vehicular traffic joints
 3. Apply Sealant No.2 to following exterior joints:
 - a. Horizontal control and expansion joints in concrete slabs and concrete paving

4. Apply Sealant No.2 to following interior joints:
 - a. Horizontal control and expansion joints in concrete slabs and tile flooring.
- I. **Sealant No. 3:**
 1. Mildew-Resistant One-Part Silicone Rubber Sealant; Type S, Grade NS, Class 25; compounded specifically for mildew resistance and recommended by manufacturer for interior joints in wet areas; passing ANSI A 136.1 test for mold growth.
 2. Provide one of following products:
 - a. DOWSIL 786 by Dow Performance Silicones.
 - b. GE Silicone Sanitary 1702 Sealant by Momentive Performance Materials, Inc.
 - c. Pecora 898NST by Pecora Corporation.
 - d. Sikasil-M Plus US by Sika Corporation
 3. Apply Sealant No. 3 to following interior joints:
 - a. Joints between plumbing fixtures and other elements

2.02 MISCELLANEOUS MATERIALS

- A. Joint Primer:
 1. Provide type of joint primer recommended by sealant manufacturer for joint surfaces to be primed or sealed.
- B. Bond Breaker Tape:
 1. Polyethylene tape or other plastic tape as recommended by sealant manufacturer to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant.
 2. Provide self-adhesive tape where applicable.
- C. Sealant Backer Rod:
 1. Compressible rod stock of polyethylene foam, polyethylene jacketed polyurethane foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended by sealant manufacturer for compatibility with sealant.
 2. Provide products by one of following, or approved equal.
 - a. Denver Foam by Backer Rod Mfg. Inc.
 - b. Sof-Rod by Nomaco, Inc.
 - c. Sealtight Kool-Rod by W.R. Meadows, Inc.

2.03 SOURCE QUALITY CONTROL

- A. Provide sealant materials of each type to be product of one manufacturer throughout Project.

2.04 PERFORMANCE AND TESTING REQUIREMENTS

- A. Non-Structural Sealant Tests:
 1. Perform testing in accordance with ASTM or other acceptable recognize standards
 2. Provide sealant manufacturer's laboratory test results on current production sealant for applicable characteristics and properties listed in ASTM C 920, Section 8

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

3. Provide sealant manufacturer's laboratory test results on recommended products applied on materials which will form joints in actual building construction
4. Make adhesion tests and bleed/stain tests on each material which forms joints to be sealed
5. Provide tests and information on compatibility of sealant with accessory materials which may be in contact with sealant.
6. Results of manufacturer's tests are to be available for preconstruction meeting specified in 1.03 C.
7. Acceptable Test Results:
 - a. Peel Adhesion Strength:
 - 1) Minimum 15 pounds per linear inch when tested according to ASTM C 794, with results reported after following cure conditions:
 - 2) 7 day dry cure
 - a) 14 day dry cure
 - b) 14 day dry plus 1 day wet cure
 - c) 14 day dry plus 7 day wet cure
 - b. Bleed/Stain: No visible bleeding or staining on exposed materials in contact with sealants

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine joints, with installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance.
 1. Correct improper conditions.

3.02 JOINT PREPARATION

- A. Remove dirt, insecure coatings, moisture, and other substances which could interfere with bond of sealant.
- B. Prepare joint surfaces, prime as required and install backup, and bond-breaker immediately before installation of sealant.
 1. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer.
 2. Roughen vitreous and glazed joint surfaces as recommended by sealant manufacturer.
- C. Prime joint surfaces where recommended by sealant manufacturer.
 1. Do not allow primer to spill or migrate onto adjoining surfaces.

3.03 INSTALLATION OF SEALANT

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.
- B. Set joint filler units at proper depth or position in joint to coordinate with other work, including installation of bond breakers, backer rods and sealant.
 1. Do not leave voids or gaps between ends of joint filler units.

- C. Install sealant backer rod for sealants, except where recommended to be omitted by sealant manufacturer for application indicated.
- D. Install bond breaker tape where required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.
- E. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint bond surfaces equally on opposite sides.
 - 1. Except as otherwise indicated, fill sealant rabbet to slightly concave surface, slightly below adjoining surfaces.
 - 2. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form slight cove, so that joint will not trap moisture and dirt.
 - 3. Tool joints to form smooth, uniform beads with slightly concave surfaces, with finished joints straight, uniform, smooth and neatly finished.
 - 4. Remove excess sealant from adjacent surfaces of joint, leaving work in neat, clean condition.
 - 5. Do not use tooling agents unless recommended by sealant manufacturer.
- F. Coordinate installation of backup and sealant with other work as it progresses.
 - 1. Seal joints before adjacent surfaces are waterproofed or painted.
- G. Perform Work under conditions required by sealant manufacturer's application instructions, including training of installers
 - 1. Make test applications of sealants under direction of sealant manufacturer's technical representative
 - 2. Run neat, full beads without voids
 - 3. Use sufficient pressure to force sealant against internal surfaces of joints
 - 4. Tool sealant faces to smooth surface sealed to adjacent materials
 - 5. Do not stain or overrun adjacent materials
 - a. Use masking or other protection as necessary
- H. Install sealant to depths recommended by sealant manufacturer but within following general limitations, measured at center (thin) section of bead:
 - 1. For sidewalks, pavements and similar joints sealed with elastomeric sealant and subject to traffic and other abrasion and indentation exposures, fill joints to depth equal to 75 percent of joint width, but neither more than 1/2 inch deep nor less than 3/8 inch deep.
 - 2. For normal moving joints sealed with elastomeric sealant but not subject to traffic, fill joints to depth equal to 50 percent of joint width, but neither more than 1/2 inch deep nor less than 1/4 inch deep.
 - 3. For joints sealed with non-elastomeric sealants, fill joints to depth in range of 75 percent to 125 percent of joint width.
- I. Where irregular surface or sensitive joint border exists apply masking tape at edge of joint to insure joint neatness and protection.
 - 1. Remove masking tape after sealant is applied.
- J. Spillage:
 - 1. Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces.
 - 2. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- K. Recess exposed edges of exposed joint fillers slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.
- L. Bond ends of joint filler together with adhesive or join by other means as recommended by manufacturer to ensure continuous watertight performance.

3.04 PROTECTION AND CLEANING

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of substantial completion.
 - 1. When, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealant immediately and reseal joints with new materials to produce joint sealant installations with repaired areas indistinguishable from original work.
- B. Clean off excess sealant or sealant smears adjacent to joints as Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION 07 9200

SECTION 08 1113

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Replacement of hollow metal doors.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 07 9200: Joint Sealants
 - 3. Section 08 7100: Door Hardware
 - 4. Section 09 9100: Painting; field painting of hollow metal doors and frames

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition
 - 1. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.
- B. American National Standards Institute (ANSI)/ Steel Door Institute (SDI):
 - 1. ANSI/SDI A250.4 – Test Procedure and Acceptance Criteria for – Physical Endurance for Steel Doors, Frames, and Frame Anchors
 - 2. ANSI/SDI A250.6 – Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames
 - 3. ANSI/SDI A250.8 – Specifications for Standard Steel Doors and Frames (SDI-100)
 - 4. ANSI A250.10 – Test Procedure and Acceptance Criteria for Prime Painted Steel Doors and Frames.
 - 5. ANSI/SDI A250.11 – Recommended Erection Instructions for Steel Frames.
 - 6. SDI 117 – Manufacturing Tolerances for Standard Steel Doors and Frames.
- C. ASTM International (ASTM):
 - 1. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 2. ASTM A653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 3. ASTM A1008 – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
 - 4. ASTM A1011 – Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.

1.03 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's data for each type of door and frame indicated.
 - a. Including, but not necessarily limited to following:
 - 1) Door designation
 - 2) Type, level, and model
 - 3) Material description
 - 4) Core description
 - 5) Construction details
 - 6) Finishes.

- B. Shop Drawings:
 - 1. Showing fabrication and installation of steel doors.
 - a. Including, but not limited to following:
 - 1) Elevations of door design types
 - 2) Conditions at openings
 - 3) Details of construction
 - 4) Location and installation requirements of finish hardware and reinforcements.
 - 5) Details of joints and connections.

- C. Certification:
 - 1. Certification of compliance with referenced standards and specified criteria, including but not necessarily limited to:
 - a. Physical Endurance in accordance with ANSI A250.4
 - b. Prime Paint performance in accordance with ANSI A250.10, and as specified.

- D. Door Schedule:
 - 1. Use same reference designations indicated on Drawings in preparing schedule for doors.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Minimum documented experience of more than five years providing hollow metal doors for similar size projects.

- B. Coordinate with hardware supplier for fabrication of doors and frames to receive hardware items.

- C. Quality Standards:
 - 1. Provide steel doors complying with referenced standards as follows:
 - a. ANSI/SDI A250.4
 - b. ANSI/SDI A250.8
 - c. ANSI A250.10

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors cartoned or crated to provide protection during transit and Project storage.

- B. Inspect doors upon delivery for damage and notify shipper and supplier should damage be found.
 - 1. Minor damages may be repaired provided refinished items are equal with respect to new work and acceptable to Architect.
 - 2. Remove and replace damaged items that cannot be repaired as directed.
- C. Store doors at Project Site under cover.
 - 1. Place units on minimum 4 inch high wood blocking.
 - 2. Avoid using non-vented plastic or canvas shelters that could create humidity chamber.
 - 3. Should door packaging become wet, remove cartons immediately.
 - 4. Provide minimum 1/4 inch spaces between stacked doors to permit air circulation.

1.06 WARRANTY

- A. Furnish manufacturer's 1 year material and workmanship warranty.
- B. Furnish installer's 2 year labor warranty.

1.07 REGULATORY REQUIREMENTS

- A. Accessibility:
 - 1. Conform to requirements of CBC Chapter 11B, Section 11B-404

1.08 WARRANTY

- A. Furnish manufacturer's 1 year material and workmanship warranty.
- B. Furnish installer's 2 year labor warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with specified requirements, provide products by one of following, or approved equal:
 - 1. ASSA ABLOY Door Security Solutions.
 - 2. Door Components, Inc.
 - 3. Steelcraft; division of Allegion
- B. Materials, Fabrication, and Installation:
 - 1. Comply with requirements of standards referenced in "Quality Assurance" Article.

2.02 MATERIALS

- A. General:
 - 1. Steel thicknesses meeting minimum requirements of ASTM standards and as described in ANSI/SDI A250.8.
- B. Metallic Coated Steel Sheets:
 - 1. ASTM A 653, Commercial Steel (CS), Type B.
 - a. A40 zinc-iron-alloy (galvannealed) coating

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- b. Stretcher-leveled standard of flatness.
- C. Cold Rolled Steel Sheets:
 - 1. ASTM A 1008, Commercial Steel (CS)
 - a. Suitable for exposed applications, Type B.
 - b. Stretcher-leveled standard of flatness.
- D. Supports and Anchors:
 - 1. Fabricate from minimum 16 gage sheet steel unless noted otherwise.
 - 2. After fabricating, galvanize units to be built into exterior walls according to ASTM A 153, Class B.
- E. Inserts, Bolts, and Fasteners:
 - 1. Provide as shown on Drawings and to suit conditions of secure installations.
 - 2. Provide items to be built into exterior walls, hot-dip galvanized according to ASTM A 153.
 - 3. Furnish Type 304 stainless steel fasteners at exterior doors.
- F. Sound Deadener:
 - 1. Spray-on type, non-combustible and non-bleeding
 - a. INC DC-10 Noise Dampening Compound by Industrial Noise Control, Inc., or approved equal

2.03 DOORS

- A. General:
 - 1. Provide type and size of doors shown with louvers and openings for glazing where indicated.
 - 2. Minimum Door Thickness: 1-3/4 inches.
- B. Exterior Doors:
 - 1. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI A250A for physical endurance level:
 - a. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless).
 - 1) 0.053 inch (16 gage) thick faces.

2.01 FABRICATION

- A. General:
 - 1. Fabricate steel door units to comply with ANSI/SDI A250.8 to be rigid, neat in appearance, and free from defects including warp and buckle.
 - 2. Clearly identify work that cannot be permanently factory assembled before shipment, to ensure proper assembly at Project Site.
- B. Exterior Door Construction:
 - 1. Fabricate doors and frames from metallic coated steel sheet for exterior locations and elsewhere as indicated,.
 - 2. Close top and bottom edges of doors flush as integral part of door construction by addition of 0.053 inch thick, metallic coated steel channels with channel webs placed even with top and bottom edges.

- C. Core Construction:
 - 1. Standard Laminated Honeycomb Core:
 - a. One inch cell, 99 pound, Kraft honeycomb core.
 - b. Reinforced, stiffened, sound deadened, and insulated.
 - c. Impregnated with phenol formaldehyde free phenolic resin.
 - 1) Completely fill inside of doors and laminate to inside faces of both panels using contact adhesive applied to both panels and honeycomb core.
 - 2) Sand honeycomb surfaces for maximum adhesion.
 - d. Provide exterior doors meeting or exceeding required thermal rating indicated, scheduled, or for wall rating.
- D. Clearances for Non-Fire Rated Doors:
 - 1. Not more than 1/8 inch at jambs and heads, and not more than 1/8 inch between pairs of doors.
 - 2. Not more than 3/4 inch from bottom of door to top of concrete slab.
- E. Single-Acting, Door Edge Profile:
 - 1. Beveled edge.
- F. Tolerances:
 - 1. Comply with SDI 117 – Manufacturing Tolerances for Standard Steel Doors and Frames.
- G. Hardware Preparation:
 - 1. Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier.
 - 2. Comply with applicable requirements in ANSI A250.6 and ANSI A 115 specifications for door and frame preparation for hardware.
- H. Hardware Reinforcement and Accessories:
 - 1. Reinforce doors and frames to receive surface applied hardware.
 - a. Drilling and tapping for surface applied hardware may be done at Project Site.
 - b. Continuous Hinge:
 - 1) Minimum 14 gage continuous strip reinforcing.
 - c. Door Closers:
 - 1) Minimum 14 gage channel, 6 inches high on each side of door.
 - 2) Extend reinforcement full width of door.
 - d. Accomplish Reinforcing for other items of finish hardware according to ANSI A250.6
 - 2. Locate hardware as indicated on Shop Drawings
 - a. Where not indicated, locate according to ANSI/SDI A250.8, except where modified by requirements of CBC, Section 1008.1.9.2.

2.02 FINISHES

- A. Shop Prime Finish:
 - 1. Manufacturer's standard, factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria.
 - 2. Coordinate with Paint Systems in Section 09 9100 to ensure compatibility with field applied finish coats.

PART 3 EXECUTION

3.01 INSTALLATION – GENERAL

- A. Install standard steel doors and accessories in accordance with final shop drawings, manufacturer's data, and as specified.

3.02 DOOR INSTALLATION

- A. Install hollow metal doors complying with ANSI/SDI A2S0.B and in accordance with manufacturer's installation instructions.
 - 1. Coordinate with Work of other trades.
- B. Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI A2S0.8.
 - 1. Shim as necessary to comply with SDI-122 and ANSI/DHI A 115.1G.
- C. Adjust operable parts for correct function.
- D. Remove hardware, except prime coated items, tag, box, and install after finish painting has been completed.

3.03 PRIME COAT TOUCH-UP

- A. Prime Coat Touch-Up:
 - 1. Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air drying primer.

3.04 REPAIR, ADJUST, AND CLEAN

- A. Repairs:
 - 1. Fill surface depressions, including countersunk fasteners, with metallic paste filler
 - 2. Allow to thoroughly cure, sand flush, and smooth for invisible appearance with adjacent metal surfaces.
- B. Protection Removal:
 - 1. Immediately before final inspection, remove protective wrappings from doors and frames.
- C. Final Adjustment:
 - 1. Check and readjust operating finish hardware items, leaving hollow metal doors and frames undamaged and in complete and proper operating condition.
- D. Remove and legally dispose of rubbish, debris and waste materials off Project Site.

3.05 PROTECTION

- A. Protect Work until Substantial Completion.

END OF SECTION 08 1113

SECTION 09 2900

GYPSUM BOARD

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Gypsum board systems and accessory components for gypsum board partitions, and ceilings.
 - a. Gypsum board attached to wood framing.
 - b. Tile Backer Board
 - c. Gypsum board finishing.
- B. Related Sections:
1. Section 01 4100: Regulatory Requirements; current Code edition.
 2. Section 06 1053: Miscellaneous Carpentry; framing, wood blocking, and nailers.
 3. Section 07 2900: Building Insulation; thermal and sound attenuation insulation
 4. Section 07 9200: Joint Sealants
 5. Section 09 9100: Painting; priming and finish painting of gypsum board.

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition.
1. CBC, Chapter 25 – Gypsum Board, Gypsum Panel Products, and Plaster.
- B. ASTM International (ASTM):
1. ASTM C 473 – Standard Test Methods for Physical Testing of Gypsum Panel Products.
 2. ASTM C 518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 3. ASTM C 834 – Standard Specification for Latex Sealants
 4. ASTM C 840 – Standard Specification for Application and Finishing of Gypsum Board.
 5. ASTM C 1002 – Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 6. ASTM C 1047 – Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 7. ASTM C 1396 – Standard Specification for Gypsum Board.
 8. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 9. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
 10. ASTM E 90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
 11. ASTM E 119 – Standard Test Methods for Fire Tests of Building Construction and Materials

12. ASTM E 413 - Classification for Rating Sound Insulation

C. Gypsum Association (GA):

1. GA 214 – Recommended Levels of Gypsum Board Finish.
2. GA-216 – Application and Finishing of Gypsum Panel Products.
3. GA-600 – Fire Resistance Design Manual

1.03 SYSTEM DESCRIPTION

A. Design Requirements:

1. Provide systems capable of deflection as required by current CBC and authorities having jurisdiction.

1.04 SUBMITTALS

A. Product Data:

1. Manufacturer's catalog data for each product proposed for use.
2. Manufacturer's certification of compliance with fire and sound requirements indicated or specified.

B. Shop Drawings:

1. Details of proprietary or non-proprietary components when included.

1.05 QUALITY ASSURANCE

A. Qualifications:

1. Installer:
 - a. Minimum 5 years experience in installing and finishing gypsum board.

B. Finishes:

1. Conform to requirements of GA 214, and as specified.
2. Levels used on Project are described as follows:

LEVELS OF GYPSUM BOARD FINISH					
Level	Joints	Interior Angles	Accessories	Fasteners	Surface
1	Tape set in compound	Tape set in joint compound			Tool marks and ridges acceptable
4	After taping, cover with two separate coats of joint compound	After taping, cover with one separate coat of joint compound	Covered by 3 separate coats of joint compound	Covered by 3 separate coats of joint compound	Smooth and free of tool marks and ridges *

* At completion of specified taping and finishing, apply one coat of high solids primer as specified in Sec

C. Preinstallation Conference: Conduct conference at Project Site.

1. Review methods and procedures for Work related to:
 - a. Gypsum Board partition assemblies.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original, factory sealed packages, containers or bundles bearing brand name and name of manufacturer.
- B. Keep materials dry.
 - 1. Neatly stack gypsum board flat.
 - 2. Avoid sagging and damage to edges, ends, and surface
- C. Use means necessary to protect gypsum board systems before, during and after installation.

1.07 PROJECT CONDITIONS

- A. Install gypsum panels following environmental conditions, room temperatures and ventilation specified.

1.08 REGULATORY REQUIREMENTS

- A. Comply with current CBC requirements for design and installation.
 - 1. CBC, Chapter 25.
- B. Fire-Resistance Ratings:
 - 1. Comply with fire-resistance ratings as shown and as required by governing authorities and codes.
 - 2. Provide materials, accessories and application procedures which have been listed by UL or tested according to ASTM E 119 for type of construction shown.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Products of following manufacturers form basis for design and quality intended.
 - 1. Georgia-Pacific Gypsum LLC, Atlanta, GA
 - 2. National Gypsum Company, Charlotte, NC.
 - 3. United States Gypsum Company (USG), Chicago, IL

2.02 MATERIALS

- A. Moisture and Mold Resistant Gypsum Panels – **Type 2**:
 - 1. Conforming to ASTM C 1396.
 - 2. Width: 48 inches.
 - 3. Thickness: 5/8 inch.
 - 4. Edges: Tapered.
 - 5. UL Type: SCX.
 - 6. Fire Resistance:
 - a. Class A as defined in CBC Section 803.1
 - b. When tested in accordance with ASTM E 84:
 - 1) Flame Spread Index: 15
 - 2) Smoke Developed Index: 0
 - 7. Average Water Absorption, ASTM C 473:
 - a. Not greater than 5 percent by weight after two hour immersion.
 - 8. Location:
 - a. Provide at walls and ceilings in toilet rooms, not indicated to receive tile.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
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9. Product and Manufacturer:
 - a. Sheetrock Brand Mold Tough Firecode X Panels by USG, or approved equal.

- B. Tile Backer Board – **Type 5**:
 1. Cementitious Backer Units:
 - a. Water-resistant, non-combustible cementitious panels reinforced with fiberglass scrim, conforming to ANSI A118.9:
 - b. Durock Brand Cement Board, 5/8 inch, by USG Corporation, or approved equal.
 - c. Tape joints with Durock glass fiber tape and ANSI A136.1 Type I organic adhesive, or approved equal.
 2. Fasteners for Cementitious Backer Units:
 - a. Wood Studs, 18 gage: 1-1/4 inch Buildex T/3 self-embedding-head screws.

- C. Fastenings:
 1. Steel Drill Screws:
 - a. Self-drilling, self-tapping bugle-head drywall screws:
 - 1) Conforming to ASTM C 1002:
 - b. For fastening gypsum board to wood members.
 - c. Type S, 1-5/8 inches long bugle head for steel framing
 - 1) For single-layer panels.
 - 2) Use longer screws for double-layer panels as recommended by manufacturer.
 - d. Furnish screws with corrosion-resistant treatment.

- D. Metal Trim:
 1. Conforming to ASTM C 1047:
 - a. Metal trim and cornerbead fabricated from minimum 26 gage steel sheet zinc coated by hot-dip process or rolled zinc.
 - 1) Paper-faced where required.
 2. Trim Units:
 - a. Shapes indicated below by reference to Figure 1 designations in ASTM C 1047 of size and type to fit gypsum board construction:
 - 1) Cornerbead on outside corners, unless otherwise indicated.
 - 2) LC-bead with both face and back flanges:
 - a) Face flange formed to receive joint compound.
 - b) Use LC-beads for edge trim, unless otherwise indicated.
 - 3) L-bead with face flange only:
 - a) Face flange formed to receive joint compound.
 - b) Use L-bead where indicated.
 - 4) U-bead with face and back flanges:
 - a) Face flange formed to be left without application of joint compound.
 - b) Use U-bead where indicated.
 - b. Control Joint:
 - 1) One-piece control joint formed with V-shaped slot and removable strip covering slot opening.
 - c. Crimp-on type trim is not allowed.
 3. Acceptable Manufacturers:
 - a. USG, Beadex, National Gypsum Company, or approved equal.

- E. Finishing Materials:
 - 1. Gypsum Board Primer and Paint:
 - a. As specified in Section 09 9100.

2.03 PERFORMANCE

- A. Air Pressure Loads:
 - 1. Design for following, unless indicated otherwise, based on Project requirements.
 - a. General – Minimum 5 psf,
- B. Deflection Limit:
 - 1. L/240, unless indicated otherwise, based on Project requirements.
- C. STC Rating:
 - 1. Minimum STC 40

PART 3 EXECUTION

3.01 INSTALLATION

- A. Wood Framing:
 - 1. Refer to Section 06 1053.
- B. Metal Trim:
 - 1. Provide following:
 - a. Corner beads at outside corners and angles
 - b. Metal casing where gypsum board terminates at uncased openings
 - c. Metal edge trim where board edges abut horizontal and vertical surfaces of other construction.
 - 2. Install trim in accordance with manufacturer's directions and secure to framing with joint compound.
 - a. Apply trim in longest practical pieces.
- C. Gypsum Board:
 - 1. Install gypsum board in conformance with ASTM C 840 and the manufacturer's recommendations.
 - 2. Install gypsum board tight to underside of structure at sound rated partitions.
 - 3. Cut gypsum board by scoring and breaking or by sawing, working from face side.
 - a. Where board meets projecting surfaces, scribe and neatly cut.
 - b. Cope gypsum board to conform to metal deck flutes at sound rated partitions.
 - 1) Refer to Section 07 2100 for installation of sound attenuation insulation in deck flutes.
 - c. Unless conditions require otherwise, apply board first to ceilings, then to walls.
 - d. End joints to occur over support.
 - e. Use panels of maximum practical length so that minimum number of end joints occur.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

4. Stagger end joints and arrange joints on opposite sides of partition to occur on different studs.
 - a. Make joint layout at openings so that no end joints will align with edges of openings.
5. Except where specified otherwise, space fasteners not less than 3/8 inch from edges and ends of gypsum board.
 - a. Do not stagger fasteners at adjoining edges and ends.
6. Install gypsum board vertically or horizontally.
 - a. Attach board with drywall screws spaced not to exceed 8 inches on center around perimeter of boards and 12 inches on center on intermediate studs.
 - b. Space screws at 8 inches on centers along top and bottom runners.
 - c. Drive screws to provide screwhead penetration just below gypsum board surface without breaking surface layer.
 - d. Where electrical outlet and switch boxes are indicated, provide adjustable attachment brackets between studs.
 - e. Nails are not permitted.
7. Install gypsum board to heights indicated, with long dimension at right angles to steel framing members.
 - a. Attach with specified drywall screws spaced 6 inch to 7 inch on centers across board.
 - b. Do not install screws less than 1/2 inch from side joints and 3/8 inch from butt end joints.
 - c. Install so that abutting end joints occur over framing and that end joints of boards are staggered.
8. Install access doors, furnished under separate section, in correct location, plumb or level, flush with adjacent construction, and securely attached to framing.

3.02 TOLERANCES

- A. Install gypsum board flat within 1/8 inch in 10 feet.

3.03 JOINT TREATMENT AND FINISHING

- A. Conform to GA 214 and following.
 1. Apply tape bedding compound, tape, and finishing cement on joints in gypsum board, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fasteners heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for for specified levels of finish.
 2. Apply joint tape over gypsum board joints, except those with trim accessories having flanges not requiring tape.
 3. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- B. Level 1:
 1. Embed tape in joint compound.
- C. Levels 4:
 1. Apply joint cement and finishing cement over screw heads.
 - a. Treat inside corners with joint cement, tape, and finishing cement.
 - b. Treat outside corners with corner beads and finishing cement.

2. Provide metal casing beads at edges of gypsum board which abut ceiling, wall, or column finish, and elsewhere as required.
 - a. Make exposed joints, trims and attachments non-apparent following application of paint or other finishes.
 - b. Where joints and fasteners are apparent, correct defects as directed.
 3. Seal raw edges of plumbing openings and boards that have been cut to fit with brushed on sealing compound.
- D. Additional Finish Requirements:
1. When entire installation is completed and prior to installation of finish materials by other trades, correct and repair broken, dented, scratched or damaged gypsum board
 2. Level 4:
 - a. Apply one coat of high solids primer over entire surface.

3.04 REQUIRED LEVELS OF FINISH

- A. Levels of finish required are as follows, unless otherwise indicated or specified:
1. Level 1:
 - a. Ceiling plenum areas above ceilings, fire-taped areas, insides of shafts, and other concealed areas, unless higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies..
 2. Level 4:
 - a. Exposed, painted gypsum board in classrooms, utility rooms, corridors and areas receiving vinyl wall covering.

3.05 REPAIR OF DAMAGED GYPSUM BOARD

- A. Upon completion of gypsum board installation, examine areas of Work and make necessary repairs as follows:
1. Reset protruding or loose fasteners.
 2. For each screw in fractured area or protruding screws, replace with specified screw placed in undamaged area near loose screw.
 3. Remove loose gypsum, paper, and joint compound.
 4. Refinish to match existing texture.
 - a. Paint entire wall plane.
 - 1) Color to match existing.

3.06 CLEANING

- A. Upon completion, repair damage caused by Work and remove debris, surplus materials and tools of Work from Project Site.
- B. Leave installation clean and ready for finishing.

END OF SECTION 09 2900

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 09 3000

TILE

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Porcelain floor tile.
 - 2. Ceramic wall tile.
 - 3. Crack isolation membranes for tile.
 - 4. Setting beds for tile:
 - a. Thinset for floor and wall tile.

- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 07 9200: Joint Sealants

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition.
 - 1. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.

- B. ASTM International (ASTM):
 - 1. ASTM A1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
 - 2. ASTM C 91 – Standard Specification for Masonry Cement
 - 3. ASTM C 144 – Standard Specification for Aggregate for Masonry Mortar
 - 4. ASTM C 150 – Standard Specification for Portland Cement
 - 5. ASTM C 206 – Standard Specification for Finishing Hydrated Lime
 - 6. ASTM C 207 – Standard Specification for Hydrated Lime for Masonry Purposes
 - 7. ASTM D 2047 – Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine

- C. American National Standards Institute, Inc. (ANSI):
 - 1. ANSI A108 – Standard Specifications for the Installation of Ceramic Tile.
 - 2. ANSI A118 – Standard Specifications for Ceramic Tile Installation Materials.
 - 3. ANSI A137.1 – Standard Specifications for Ceramic Tile.

- D. Tile Council of North America (TCNA):
 - 1. TCNA Handbook for Ceramic, Glass, and Stone Tile Installation, latest edition.

1.03 DEFINITIONS

- A. Regular Tile:
 - 1. Defined as tile of nominal size of 15 inches or less.

1.04 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's data, standard specifications, and other technical information for each product specified.
- B. Samples:
 - 1. Minimum of four samples, or four sample sets for each type of tile and for each color and texture required:
 - a. Not less than 12 inches square.
 - 1) Mounted on plywood or hardboard backing and grouted as required.
 - b. Provide minimum of four board-mounted tiles for sizes 4-1/4 inches and larger.
 - 2. Full size samples for each type of trim, accessory and for each color.
- C. Installation Instructions:
 - 1. Manufacturer's preparation and installation instructions.
- D. Certificates:
 - 1. Manufacturer's certification that grout materials being provided are suitable for intended use, meet or exceed referenced standards.
 - 2. DCOF AcuTest friction test reports for floor tile.
- E. Reference Methods:
 - 1. Copies of TCNA and ANSI Methods and Standards.

1.05 QUALITY ASSURANCE

- A. Laboratory Testing:
 - 1. Test tile for compliance with ASTM C 2047 by testing laboratory approved by DSA.
- B. Qualifications of Tile Manufacturer:
 - 1. Company specializing in types of tile specified.
 - a. Including trim units, and thresholds when required, with five years minimum experience.
 - b. Obtain tile and trim components from single source for each type and color of tile with resources to provide products of consistent quality in appearance and physical properties.
- C. Qualification of Installation System Manufacturer:
 - 1. Company specializing manufacturing of installation systems and materials:
 - a. Including mortars, grouts, and adhesives
 - b. With ten years minimum experience.
 - 2. Obtain grout and setting materials from single source manufacturer to ensure consistent quality and compatibility.
- D. Qualifications of Installer:
 - 1. Company specializing in installation of types of tile and installation systems specified.
 - a. Including trim units, and thresholds when required, with five years minimum experience with installations of similar scope, materials, and design.

- E. Pre-Installation Meetings:
 - 1. Following approval of submittals and prior to start of Work and setting of tile:
 - a. Schedule on-site meeting with Contractor, Owner, Architect, Project Inspector, and representatives of material manufacturer and tile installer:
 - 1) Review following for conformance with specified requirements:
 - a) Conditions and Drawings for each substrate.
 - b) Tile, tile installation materials, and finishing equipment.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged tile materials in original in manufacturer's sealed containers, with seals unbroken and manufacturer's labels intact until time of use.
 - 1. Prevent damage or contamination to materials by water, foreign matter or other causes.
- B. Keep materials clean and dry.

1.07 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect Work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Maintain temperatures at not less than 50 degrees F in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard, or manufacturer's instructions.
- C. Shade Work area from direct sunlight during installation as needed to prevent rapid evaporation caused by excessive heat.
- D. Observe manufacturer's recommended safety precautions, including those pertaining to ventilation.
- E. Illuminate Work area during installation, providing same level and angle of illumination as will be available for final inspection.
- F. Protection:
 - 1. Protect adjacent surfaces during progress of Work of this Section.
 - 2. Close rooms and spaces to traffic until mortar and grout have set for minimum of 72 hours.

1.08 REGULATORY REQUIREMENTS

- A. Comply with requirements of current California Building Code and Chapter 11B
- B. Comply with applicable parts of following codes or standards as minimum requirement:
 - 1. ANSI A108.
 - 2. ANSI A118.
 - 3. ANSI A137.1, Section 9.6 – DCOF AcuTest.

1.09 EXTRA MATERIAL

- A. Provide minimum of 5 percent of each type and color of tile and accessory shapes, from same run or lot as installed tile.
 - 1. Furnish full size units matching units installed, packaged with protective covering for storage, in manufacturers' cartons identified with appropriate labels.

1.10 WARRANTY

- A. Manufacturer's Warranty:
 - 1. For tile products and installation materials.
 - a. Provide 5 year material warranty.
- B. Installer's Warranty:
 - 1. Provide 5 year labor warranty on tile installation.
- C. Manufacturer's Warranty:
 - 1. For Crack Isolation Membrane:
 - a. Provide 10 year material warranty for crack isolation and waterproofing membrane installation.
 - 1) Includes tile setting and grouting materials.

PART 2 PRODUCTS

2.01 PRODUCTS – GENERAL

- A. Comply with ANSI A137.1 for types, compositions, and grades of tile indicated.
 - 1. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.
- B. Comply with ANSI standard referenced with products and materials indicated for setting and grouting
- C. Dynamic Coefficient of Friction (DCOF): Provide floor tiles with coefficient of friction equal to or greater than 0.42 when tested in accordance with provisions of ANSI A137.1, Section 9.6 – DCOF AcuTest.
- D. Condition of Surfaces to Receive Tile:
 - 1. Verify that surfaces to receive mortar setting bed and tile are firm, dry, clean, and free from oily or waxy films and curing compounds.

2.02 TILE PRODUCTS

- A. Porcelain Floor Tile: **PT-1**
 - 1. Unpolished Porcelain Floor Tile
 - 2. Face Size: Nominal 8 inches by 8 inches
 - 3. Nominal Thickness: To be determined.
 - 4. Surface/Texture: Unpolished
 - 5. Color: To match existing
 - 6. Manufacturer: Daltile Fabrique Colorbody Porcelain.

- B. Ceramic Wall Tile: **CT-1**
1. Ceramic Wall Tile – Field
 2. Face Size: Nominal 4-1/4 inches by 4-1/4 inches
 3. Nominal Thickness: 5/16 inch.
 4. Surface/Texture: Semi-Gloss
 5. Color: Arctic White 0190.
 6. Manufacturer: Daltile Semi-Gloss.
- C. Ceramic Wall Tile: **CT-2**
1. Ceramic Wall Tile – Accent
 2. Face Size: Nominal 4-1/4 inches by 4-1/4 inches
 3. Nominal Thickness: 5/16 inch.
 4. Surface/Texture: Semi-Gloss
 5. Colors: To match existing
 6. Manufacturer: Daltile Semi-Gloss.
- D. Ceramic Wall Tile: **CT-2**
1. Ceramic Wall Tile – Accent
 2. Face Size: Nominal 4-1/4 inches by 4-1/4 inches
 3. Nominal Thickness: 5/16 inch.
 4. Surface/Texture: Semi-Gloss
 5. Colors: To match existing
 6. Manufacturer: Daltile Semi-Gloss.
- E. Bullnose Trim for Tiles CT-1:
1. Face Size: Nominal 4-1/4 inches by 4-1/4 inches
 2. Nominal Thickness: 5/16 inch
 3. Surface/Texture: Semi-Gloss
 4. Color: To Match Wall Tile
 5. Manufacturer: Daltile Semi-Gloss
- F. Flat Top Cove Base: **CT-3**
1. Ceramic Flat Top Cove Base
 2. Face Size: Nominal 4 inches by 6 inches
 3. Nominal Thickness: 5/16 inch
 4. Surface/Texture: Semi-Gloss
 5. Color: Arctic White 0190.
 6. Manufacturer: Daltile Semi-Gloss.

2.03 INSTALLATION MATERIALS

- A. Mortar Sand:
1. Conforming to ASTM C 144.
- B. Cement:
1. Portland Cement:
 - a. Conforming to ASTM C 150, Type I.
 2. Masonry Cement:
 - a. Conforming to ASTM C 91, Type S or M.
- C. Hydrated Lime:
1. Conforming to:
 - a. ASTM C 206, Type S

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- b. ASTM C 207, Type S

- D. Water:
 - 1. Clean and potable.

- E. Crack Isolation Membrane:
 - 1. Sheet membrane product specifically manufactured for use in thin-set tile installations at slab-on-grade conditions as crack isolation sheet to prevent cracks in concrete slab from telegraphing through to tile.
 - 2. Acceptable Products and Manufacturers:
 - a. NobleSeal® TS or CIS Membrane by Noble Company.
 - 1) Zero VOC
 - b. Crack Buster Pro Crack Prevention Mat Underlayment, by Custom Building Products, Inc.
 - 1) Zero VOC
 - c. Or approved equal.
 - 3. Liquid applied membranes are not acceptable.

2.04 MORTAR

- A. Polymer-Modified Portland Cement Mortar:
 - 1. Polymer -Modified Portland Cement Dry-Set Mortar:
 - a. Conforming to ANSI A 118.4.
 - 1) Gauged with Acrylic Mortar Admix
 - b. Conforming to ANSI A 118.15:
 - 1) Gauged with improved modified Acrylic Mortar Admix for large format tiles.

2.05 GROUT

- A. Manufacturers:
 - 1. Basis-of-Design:
 - a. Design for grout materials is based on products as manufactured by Mapei North America, Deerfield Beach, FL.

- B. Floor Grout:
 - 1. Chemical-resistant, water-cleanable, grouting epoxy:
 - a. Conforming to ANSI A118.3
 - 2. Provide product capable of withstanding continuous and intermittent exposure to temperatures up to 140 degrees F and 212 degrees F, respectively.
 - a. Certified by grout manufacturer for intended use.

- C. Grout Joints:
 - 1. Unsanded grout on joints less than than 1/8 inch.
 - 2. Sanded grout on joints 1/8 inch or greater.

- D. Grout Colors:
 - 1. As selected/scheduled by Architect.

2.06 MISCELLANEOUS MATERIALS

- A. Sealant and Backer Rod:
 - 1. Comply with specified requirements in Section 07 9200

2. Provide sealant and primer from one manufacturer, acceptable to tile and grout manufacturers.
 3. Provide backer rod as specified for compatibility with sealants.
- B. Accessory Materials:
1. Premolded accessories for crack isolation and waterproofing membranes.
 - a. Including, but not necessarily limited to premolded corners.
- C. Cleaner and Sealer:
1. General:
 - a. Provide materials from one manufacturer, acceptable to tile and grout manufacturers.
 - b. Provide cleaner and sealer products manufactured by one following manufacturers:
 - 1) Aqua Mix Inc., Torrington, CT
 - 2) Custom Building Products, Huntington Beach, CA
 - 3) Miracle Sealants Company, div. of Rust-Oleum Corporation, Vernon Hills, IL
 - 4) Approved equal may be provided, subject to compatibility with specified tile and grout materials..
 2. Cleaner:
 - a. Neutral Phosphate-Free Cleaner:
 - 1) Concentrated Tile Cleaner by Aqua Mix Inc.
 - 2) Tile Lab Concentrated Tile/Stone Cleaner by Custom Building Products.
 - 3) Tile & Stone Cleaner by Miracle Sealants Company.
 3. Sealer:
 - a. Fungus and Bacteria Resistant, Stain and Slip-Resistant as specified for Tile:
 - 1) Penetrating Sealer by Aqua Mix.
 - 2) Tile Lab Surface Gard by by Custom Building Products
 - 3) 511 Impregnator by by Miracle Sealants Company

2.07 SOURCE QUALITY CONTROL

- A. Source of Materials:
1. Obtain materials from single source with resources to provide products of consistent quality in appearance and physical properties.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Examine substrates, areas, and conditions under which Work will be performed for compliance with specified requirements for installation tolerances and other conditions affecting performance of installed tile.
1. Coordinate with other trades as needed to ensure that proper substrata are provided to receive work
 2. Verify that vents, drains, piping, and other projections through substrate have been installed.
 3. Correct conditions detrimental to timely and proper completion of Work.
 4. Do not proceed until unsatisfactory conditions are corrected.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- B. Verify that substrates for setting tile are firm; dry, clean and within flatness tolerances required by relevant ANSI A108 tile installation standards and following:
 - 1. Where tile units will be thin-set directly to substrata, do not commence installation of tile units until substrata are within following tolerances:
 - a. Horizontal Surfaces:
 - 1) Level within 1/8 inch in 10 feet in any direction, except for slope to floor drains.
- C. Surface Preparation:
 - 1. Condition of Surfaces to Receive Tile:
 - a. Concrete Floors:
 - 1) Allow concrete floors to cure for 28 days minimum before beginning tile and grout installation.
 - 2) Verify that surfaces to receive mortar setting bed and tile are firm, dry, clean, and free from oily or waxy films and curing compounds.
 - 3) Remove laitance, sand, dust, and loose particles with air blast.
 - 4) Where coatings, such as curing compounds and other substances containing soap, wax, oil, or silicone remain and are incompatible with tile-setting materials, remove them using terrazzo or concrete grinder, drum sander, polishing machine equipped with heavy-duty wire brush, or shot-blast system.
 - b. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical items of Work, and similar items located in or behind tile have been completed before installing tile.

3.02 SUBSTRATA AND SETTING BEDS

- A. Floors:
 - 1. Install polymer-modified Portland cement mortar over existing concrete slab.
- B. Crack Isolation and Waterproof Membranes:
 - 1. Crack Isolation Membrane:
 - a. Install crack isolation membrane over cured mortar bed in accordance with TCNA Method F122 at Ground Level (slab-on-grade) rooms scheduled to have tile.
 - 1) Use of liquid products is not permitted.
- C. Verify that joints in tile substrates are coordinated with sealed tile joint locations
 - 1. Where not coordinated, adjust as required by Architect.
- D. Do not install tile until construction in spaces is completed and ambient temperature and humidity conditions are being maintained to comply with referenced standards and manufacturer's written instructions.
- E. Protect adjacent surfaces during progress of the Work.

3.03 TILE INSTALLATION – GENERAL

- A. General:
 - 1. Conform to manufacturers printed instructions, and applicable requirements of ANSI and TCNA Standards.
 - 2. Install tile by pressing and beating tile into place to obtain 100 percent coverage by mortar on back of each tile.

- a. Back-butter tiles if necessary to achieve 100 percent coverage.
3. Maintain minimum temperature limits and installation practices recommended by setting materials manufacturers.
4. Minimum Coverage of Bond Mortar: 80 percent.
 - a. 95 percent in shower areas or exterior installations
- B. Limits of Tile:
 1. Extend tile into recesses and under equipment and fixtures to achieve complete covering without interruptions, unless otherwise indicated.
 2. Terminate tile neatly at obstructions, edges, and corners, without disruption of pattern or joint alignment.
- C. Joining Pattern:
 1. Install tile in grid pattern, unless otherwise indicated.
 2. Layout tile work, and center tile fields both directions in each space or on each wall area.
 - a. Adjust to minimize tile cutting.
 3. Provide uniform joint widths in accordance with manufacturers recommendations, unless indicated otherwise.
- D. Joint Alignment:
 1. Align joints when adjoining tiles on floor, base, trim, and walls are same size.
 2. Adjust joints widths as necessary for different size tiles to maintain patterns from floors to base to walls.
 3. Nominal joint width is 1/8 inch, but they may be adjusted plus or minus as necessary.
 - a. Do not attempt to make same joint width work consistently for every surface.
 4. If joint widths on walls need to be less than that for floor tile to maintain alignment with floor tile pattern, then reduce joints as necessary.
 5. Joints widths are to be uniform within each surface.
 - a. Floor and wall plane are to have consistent joint widths.
 - 1) Widths will be permitted to vary from floor to base and wall to make them align.
 - 2) Use 1/16 inch, 1/8 inch, 3/16 inch or 1/4 inch joint spacers where necessary.
- E. Tile Mounted in Sheets:
 1. Install joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished Work.
- F. Accurately form intersections and returns.
 1. Perform cutting and drilling of tile without marring visible surfaces.
 2. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints.
 3. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- G. Allowable Variations in Finished Work:
 1. Do not exceed following deviations from level and plumb, and from elevations, locations, slopes, and alignments shown:
 - a. Horizontal surfaces: 1/8 inch in 10 feet in any direction.
 - b. Vertical surfaces: 1/8 inch in 8 feet in any direction.

3.04 TILE INSTALLATION – FLOOR

- A. Install tile over properly cured setting bed and crack isolation or waterproof membrane utilizing thin-set method with polymer-modified Portland cement bond mortar, in accordance with manufacturer's printed instructions and ANSI A108.5.
 - 1. Confirm substrate is completely clean and free of dust.
 - 2. Cut foam at floor perimeters flush with top of mortar bed.
 - 3. Ensure that bond coats do not intrude into joints to receive sealant.

- B. Placement Method:
 - 1. Place tile into fresh mortar and move and press or beat in tile to ensure full contact.
 - 2. Before setting proceeds, set and remove three tiles or sheets of tiles to confirm specified coverage of bond mortar.
 - 3. When coverage is insufficient, utilize larger toothed trowel or back butter tiles until proper coverage is provided.

3.05 GROUTING

- A. General:
 - 1. Do not begin grouting floor tiles until they are firmly set and, in no case, in less than 48 hours after they have been installed.
 - 2. Remove spacers, ropes, glue, and similar foreign matter prior to grouting.
 - 3. When using proprietary grout, adhere strictly to manufacturer's directions unless otherwise specified or acceptable in advance by Architect.
 - 4. Prior to start of grouting, ensure that wall and floor tile surfaces are clean and excessive bond mortar is scraped and vacuumed from joints.
 - a. Approximately 2/3 depth of tile should be open for grouting.

- B. Installation – General:
 - 1. Follow manufacturer's instructions and following for mixing grout:
 - a. Mix grout by hand or with slow-speed drill motor not exceeding 300 rpm, achieving stiff non-slumping consistency, and using minimum amount of liquid to achieve workable mix.
 - 2. Once grout Work commences, proceed until complete wall or floor area is finished utilizing one batch of grout.

- C. Polymer-modified Portland Cement Grouting:
 - 1. Dampen tile surface and joints with water using sponge, but leaving no puddles in joints.
 - 2. Force maximum amount of approved grout into joints in accordance with pertinent recommendations contained in ANSI A 108.10
 - a. Use sufficient pressure on rubber float so as to fill joints completely.
 - 1) Fill joints of cushion-edge tile to depth of cushion.
 - 2) Fill joints of square-edge tile flush with surface.
 - b. Scrape excess grout off tile surface with rubber float.
 - c. Smooth or tool grout to uniform joint finish.
 - d. Do not over water.
 - 3. Fill gaps and skips.
 - a. Do not permit mortar or mounting mesh to show through grouted joints.
 - b. Provide hard finished grout which is uniform in color, smooth, and without voids, pin holes, or low spots.
 - c. Leave tile clean.

3.06 CURING OF TILE INSTALLATION AND GROUT

- A. Damp cure tile installations, including polymer-modified Portland cement grouts, for 72 hours minimum.
 - 1. Remove final grout haze with clean soft cloth.
 - 2. Cover with 40 lb. kraft paper.
 - 3. Leave paper in place for protection.
 - 4. Do not use polyethylene sheets directly over tile on horizontal surfaces.

3.07 SEALANT INSTALLATION

- A. Prepare and clean joints to receive sealant to ensure joints are free and clear of setting and grouting materials and construction debris.
- B. Install sealants in accordance with requirements of Section 07 9200.
- C. Seal between tile and penetration and restraining surfaces with sealant matching color of grout/joint filler.

3.08 CLEANING AND SEALING OF TILE AND GROUT

- A. After completion of tile installation and curing, thoroughly clean tile using neutral cleaner acceptable to manufacturers of tile and grout, complying with manufacturer's instructions.
 - 1. Do not use acid or acid cleaners to clean tile.
- B. Apply specified sealer in accordance with manufacturer's instructions.
 - 1. Avoid overlapping, puddling, and rundown.
 - 2. Completely wipe surface dry within 3 to 5 minutes using cotton or paper towels.
 - 3. Do not allow sealer to dry on tile.
 - 4. After 2 hours, test surface by applying water droplets to surface.
 - a. When water is absorbed, apply second coat.
 - 5. Avoid surface traffic for 24 hours.

3.09 REPLACEMENT

- A. Remove and replace cracked, chipped, broken, and otherwise defective tiles with proper material.
 - 1. Replace grout as necessary due to replacement of tile.
 - 2. Match existing color without evidence of replacement.
- B. Remove Work not complying with requirements of Contract Documents or referenced standards, and promptly replace with Work which does comply.

3.10 CLEANING

- A. Remove and legally dispose of rubbish, debris, and waste material off Project Site.
 - 1. Comply with requirements of Sections 01 7419 and 01 7423.

3.11 PROTECTION

- A. Do not permit foot traffic on installed tile until mortar and grout has set for minimum of 72 hours.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- B. Do not permit foot traffic on installed sealant for minimum of 48 hours or protect with hardboard strips.
- C. Protect Work until Substantial Completion.

END OF SECTION 09 3000

SECTION 09 9100

PAINTING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Surface preparation, priming, and field painting of following:
 - a. Exposed exterior and interior items and surfaces as indicated.
 - b. Installation of paintable caulking in interior dry areas.
- B. Related Sections:
1. Section 06 1053: Miscellaneous Carpentry
 2. Section 07 9200: Joint Sealants
 3. Section 08 1113: Hollow Metal Doors and Frames Doors
 4. Section 09 2900: Gypsum Board
 5. Section 32 1723: Pavement Markings; traffic paint
- C. Related Requirements:
1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

1.02 REFERENCES

- A. California Air Resources Board (CARB):
1. South Coast Air Quality Management District (SCAQMD):
 - a. Rule 1113 – Architectural Coatings
 - b. Rule 1168 – Adhesive and Sealant Applications
- B. California Department of Public Health (CDPH):
1. Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.2 – 2017
- C. United States Environmental Protection Agency (EPA):
1. 40 CFR Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings
 - a. Method 24 – Surface Coatings
- D.
- E. The Society of Protective Coatings (SSPC):
1. SSPC-SP 1 – Solvent Cleaning.
 2. SSPC-SP 2 – Hand Tool Cleaning.
 3. SSPC-SP 3 – Power Tool Cleaning.
 4. SSPC-SP 6 – Commercial Blast Cleaning
 - a. For shop preparation only.
 5. SSPC-SP 11 – Power Tool Cleaning to Bare Metal.
 - a. Field preparation only for welds and damaged shop primer.

1.03 DEFINITIONS

- A. Paint – As used in this Section:
 - 1. Means coating systems materials, including primers, emulsions, enamels, stains, sealers, and other applied materials whether used as prime, intermediate, or finish coats.

1.04 SYSTEM DESCRIPTION

- A. Paint exposed surfaces except where material is obviously intended and specifically noted as surface not to be painted:
 - 1. Where items or surfaces are not specifically mentioned, paint item or surface same as adjacent similar materials or surfaces whether or not schedules indicate colors.
 - a. When system, color, or finish is not designated, Architect will select from standard colors and finishes available.
 - 2. Refer to Finish/Color Schedules and notations on Drawings.
 - 3. Painting Includes:
 - a. Exposed steel and iron work that is not factory finished or not scheduled to receive high performance coating.
- B. Work Not to be Painted:
 - 1. Do not include painting when factory finishing or installer finishing is specified for such items as, but not limited to, following:
 - a. Factory-finished play structure and shade structure components.
 - 2. In general, following items will not require finishing unless specifically specified, scheduled, or indicated:
 - a. Do not paint over code required labels, such as Underwriters' Laboratories and Factory Mutual, or equipment identification, performance rating, name, or nomenclature plates.
 - b. Finish Hardware, except prime coated items.
 - c. Walking Surfaces:
 - 1) Painted concrete curbs and pavement markings are specified in Section 32 1723.
 - d. Concealed Surfaces:
 - 1) Painting is not required on wall or ceiling surfaces in concealed areas and inaccessible areas, such as furred areas, pipe spaces, duct shafts, and elevator shafts, as applicable to Project.
 - e. Exterior concrete and masonry
- C. Shop Priming:
 - 1. Unless otherwise specified, shop priming of ferrous metal items is included under various sections for metal fabrications, hollow metal work and similar items.

1.05 SUBMITTALS

- A. Product Data:
 - 1. Provide for each paint system specified; include primers.

2. Material List:
 - a. Provide inclusive list of required coating materials:
 - 1) Indicate each material and cross-reference specific coating, finish system, and application.
 - 2) Identify each material by catalog number and general classification.
 - 3) In addition to manufacturer's name, product name and number, include following:
 - a) Primers, thinners, and coloring agents.
 - b) Manufacturers' catalog data fully describing each material as to content, recommended installation, and preparation methods.
 - b. Identify surfaces to receive various paint materials.
 3. Manufacturer's Information:
 - a. Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
 4. Certification by manufacturer that products supplied comply with local regulations controlling use of Volatile Organic Compounds (VOC).
- B. Samples:
1. After receipt of Architect's Color Schedule, submit following for Architect's review for color and texture only:
 - a. Draw-Downs:
 - 1) Manufacturer-produced draw-downs for each color sample required
 - b. Stepped Samples:
 - 1) Defining each separate coat, including primers.
 - 2) Use representative colors when preparing samples for review.
 - 3) Resubmit until required sheen, color, and texture are achieved.
 2. Furnish list of materials and applications for each coat of each sample.
 - 1) Label each sample for location and application.
 3. Furnish minimum of four 8-1/2 by 11 inch painted samples of each color and material, with texture to simulate actual conditions.
 - a. On Metal – Provide minimum of four 4 by 8 inch samples for each type of finish and color, defining prime and finish coat.
 - b. Do not proceed with painting work until color samples have been accepted.
- C. Field Samples:
1. When and as directed by Architect, apply one complete coating system for each color, gloss and texture required.
 2. When approved, sample panel areas will be deemed incorporated into Work and will serve as standards by which subsequent Work of this Section will be judged.
- D. Provide list of solid volume factors for each type of material if so requested by Architect.

1.06 QUALITY ASSURANCE

- A. Approved Equal:
1. Provide materials or products specified by trade name as specified.
 2. Interpret references to brand names as establishing standard of quality.
 - a. Such interpretation is not to be construed as limiting competition.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

3. Presume brand names, where used in specifications, to be followed by words "or approved equal".
4. Such approval will be granted only as set forth in Contract Documents and with certification that materials are equal or superior to brand named in specifications in construction, efficiency, and utility.
5. In making submittals for approval as equal, include manufacturer's product data sheet for each product indicating composition and percent by weight.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project Site in original, new, and unopened packages and containers bearing manufacturer's name and label, and following information:
 1. Name or title of material.
 2. Product Description (Generic Classification or Binder Type).
 3. Federal Specification number, if applicable.
 4. Manufacturer's stock number and date of manufacture.
 5. Manufacturer's name
 6. Contents by volume, for major pigment and vehicle constituents.
 7. Thinning instructions.
 8. Application instructions.
 9. Color name and number.
 10. VOC Content
 11. Concurrently provide local representative of approved paint products with copies of invoices of purchased materials.
- B. Storage and Mixing of Materials:
 1. Store and mix paint materials in single suitable place in compliance with health and fire regulations.
 2. Open and mix ingredients on premises in presence of Project Inspector.
 3. Maintain such storage spaces clean and neat.
 4. Remove oily rags, waste, and like materials from building each night and take every precaution to avoid danger of fire.

1.08 PROJECT CONDITIONS

- A. Apply primers and paints only when temperature of surfaces to be painted and surrounding air temperatures are within range permitted by paint manufacturer's printed instructions.
- B. Do not apply paint in rain, fog, mist or to damp or wet surfaces; or when relative humidity exceeds 85 percent, unless otherwise specified by paint manufacturer.
- C. Do not apply paint, interior, or exterior, when temperature is below 50 degrees F or above 90 degrees F, or when dust conditions are unfavorable for application.
- D. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature ranges specified by paint manufacturer during application and drying periods.
- E. Painting Work by Other Trades:
 1. Examine Drawings and Specifications, including requirements specified in other sections for painting work by other trades.

2. Notify Architect in writing of conflicts between Work of this Section and that of other trades and sections, and errors, omissions, or impractical requirements.
3. Paint or finish surfaces that are left unfinished by requirements of their specification as Work of this Section.

1.09 REGULATORY REQUIREMENTS

- A. Codes and Standards:
 1. Conform work and materials to regulations of State Fire Marshal, Safety Color Coding in conformance with OSHA, Cal/OSHA, and local or State Ordinances having jurisdiction.
 - a. Conform to most stringent requirements and authorities having jurisdiction.
- B. Comply with applicable codes and regulations of governmental agencies having jurisdiction including those having jurisdiction over airborne emissions and industrial waste disposal.
 1. Where those requirements conflict with this Specification, comply with more stringent provisions.
 2. Regulatory changes may affect formulation, availability, or use of specified coatings.
 - a. Confirm availability of coatings to be used prior to Project bid and before start of painting on Project.
 3. Comply with current applicable regulations of following:
 - a. California Air Resources Board (CARB)
 - b. South Coast Air Quality Management District (SCAQMD)
 - c. California Department of Public Health (CDPH)
 - d. U.S. Environmental Protection Agency (EPA), as applicable.

1.10 MAINTENANCE STOCK

- A. Upon completion of Work of this Section, deliver to Owner, extra stock consisting of one gallon of each color, type, and gloss of finish (topcoat) paint used in Work.
 1. Tightly seal each container and clearly label contents and location where used.

PART 2 PRODUCTS

2.01 MATERIAL QUALITY

- A. Provide best quality commercial grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers.
 1. Materials not displaying manufacturer's identification as standard, best grade product will not be acceptable.
- B. Factory mix paint materials to correct color, gloss, and consistency for installation to maximum extent feasible.
- C. Do not use paints in Work which have been packaged longer than six months, except when such products are known to have long package stability when unopened and only when guaranteed by manufacturer.

2.02 MANUFACTURERS

- A. Manufacturer's catalog names and numbers as listed are used to aid in establishing kind and quality of material required and are not used as indication of color desired.
- B. Opaque Paint Finish Materials:
 - 1. Basis-of-Design:
 - a. Paint Systems specified are products of Dunn-Edwards Corporation, Los Angeles, CA, unless indicated otherwise.
- C. Paint Systems as listed are District Standard.
 - 1. Substitutions are not permitted.

2.03 SOURCE QUALITY CONTROL

- A. Single-Source Responsibility:
 - 1. Obtain products of only one paint manufacturer unless otherwise specified or approved.
 - a. Obtain primers, thinners, coloring agents, and catalysts for each painting system from same manufacturer as finish coats, or as approved for use by manufacturer of paint, except for materials furnished with shop prime coat by other trades.
 - 1) Use approved thinners only within recommended limits.
 - 2. Furnish materials as supplied from paint manufacturer's branded paint store or manufacturer-approved dealer.
 - 3. Furnish copies of invoices from paint supplier to manufacturer's representative and Architect.
 - a. Furnish to Owner when requested.

2.04 COLORS AND FINISHES

- A. Surface treatments and finishes are shown on Drawings and indicated in Schedules on Drawings.
 - 1. Paint colors are shown on Architect's Color Schedule.
- B. Colors required or listed by Architect are not necessarily stock colors available in one particular manufacturer's range.
 - 1. Non-availability of colors selected by Architect will be sufficient reason to disqualify manufacturer not capable of providing such colors.
- C. Paint Coordination:
 - 1. Provide finish coats which are compatible with prime paints used.
 - 2. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates.
 - 3. Upon request from other subcontractors, furnish information on characteristic of specified finish materials, to ensure that compatible prime coats are used.
 - 4. Provide barrier coats over incompatible primers or remove and reprime as required.
 - 5. Notify Architect in writing of anticipated problems using specified coating systems with substrates primed by others.

2.05 PAINTABLE CAULK

- A. Acrylic latex, one-part, non-sag, mildew resistant, non-bleeding and non-staining, acrylic emulsion component compound conforming to ASTM C 834, Type OP, Grade NS, formulated to be paintable.
 - 1. For use as interior caulk in dry, nonworking joints only.
 - 2. Must be able to accommodate joint movement of not more than 5 percent in both extension and compression for total of 10 percent.
 - 3. Backup and Bond Breaker: Products recommended by caulking manufacturer.
 - 4. Provide one of following products:
 - a. AC-20: Pecora Corporation.
 - b. Bostik Home Painter's Caulk: Bostik Construction Products.
 - c. GE RCS20: Momentive Performance Materials.
 - 5. VOC compliant per SCAQMD Rule 1168.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint.
 - 1. Do not begin paint application until unsatisfactory conditions have been corrected and surfaces scheduled to receive paint are thoroughly dry.
- B. Starting of painting will be construed as applicator's acceptance of surfaces and conditions within particular area.

3.02 SURFACE PREPARATION

- A. Clean and prepare surfaces to be painted following paint manufacturer's written instructions and as specified, for each particular substrate condition.
- B. Clean surfaces to be painted before applying paint or surface treatments.
 - 1. Remove oil and grease prior to mechanical cleaning.
 - 2. Program cleaning and painting so contaminants from cleaning process will not fall onto wet, newly painted surfaces.
 - 3. Cover surfaces and equipment as necessary to prevent contaminants from cleaning process from falling onto equipment.
- C. Clean floors and surfaces in room being painted of loose dirt and dust before painting is started.
- D. Moisture Content:
 - 1. Measure moisture content of surfaces using electronic moisture meter.
 - 2. Do not apply finishes unless moisture content of surfaces are below maximum levels specified, or as otherwise recommended by manufacturer.
- E. Remove hardware, hardware accessories, switch and receptacle plates, surface-mounted lighting fixtures, escutcheons and plates, surface-mounted equipment, free-standing equipment blocking access to painted surfaces, and other items as required prior to surface preparation and painting operations.
 - 1. Following completion of painting of each space or area, reinstall removed items.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- F. Provide barrier coats over incompatible primers or remove and reprime.
- G. Gypsum Board:
 - 1. Remove dust, loose particles or other matter that would prevent proper paint adhesion.
 - 2. Check to see that joints and screw heads have been properly covered with joint compound and sanded smooth and flush with adjacent surfaces.
 - 3. Before finishing untextured smooth gypsum board, use damp sponge along edge of joints where nap of paper has been raised by sanding.
- H. Ferrous Metals:
 - 1. Clean ungalvanized ferrous metal surfaces that have not been shop coated or are not otherwise specified to receive high performance coatings.
 - 2. Remove oil, grease, dirt, loose mill scale, and other foreign substances.
 - 3. Use solvent (SSPC SP-1) or mechanical cleaning methods (SSPC SP-2 and SP-3) that comply with The Society for Protective Coatings (SSPC) recommendations.
 - 4. Where rust or scale is present, wire brush and sandpaper clean.
 - 5. Clean field welds and abraded portions of field welded and erected ferrous metal components.
- I. Paintable Caulk Installation:
 - 1. Comply with general sealant installation requirements in Section 09 9200.
 - 2. Use only for caulking of followings joints in dry areas:
 - a. Perimeter caulking of:
 - 1) Interior door frames.
 - 2) Casework not subject to moisture.
 - 3. Joint Design:
 - a. Width of joint should be approximately 12 times anticipated movement and fall within range of 1/4 inch to 3/4 inch

3.03 MATERIAL PREPARATION

- A. Mix and prepare painting materials in field following manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers.
 - 1. Maintain containers used in storage, mixing and application of paint in clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce mixture of uniform density:
 - 1. Stir as required during application.
 - 2. Do not stir surface film into material.
 - 3. Remove film and, if necessary, strain material before using.

3.04 APPLICATION

- A. Apply paint following manufacturer's directions.
 - 1. Use applicators and techniques best suited for substrate and type of material being applied.
 - 2. Mix to proper consistency.
 - 3. On brush-applied work, brush out smooth leaving minimum of brush marks, with paint uniformly flowed on.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, and conditions otherwise detrimental to formation of durable paint film.
- C. Apply paint to clean, dry, prepared surfaces only.
 - 1. Apply paint material evenly, smoothly flowed on without runs, sags, or holidays.
- D. Provide finish coats compatible with primers used.
- E. Minimum Coating Thickness:
 - 1. Apply each material at not less than manufacturer's recommended spreading rate, to provide a total dry film thickness of not less than 5.0 mils for entire coating system of prime and finish coats for 3 coat work.
 - 2. Provide total dry film thickness of not less than 3.5 mils for entire coating system of prime and finish coat for 2 coat work.
- F. Number of coats and film thickness required is same regardless of application method.
 - 1. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
 - 2. Sand between applications where sanding is required to produce even smooth surface following manufacturer's directions.
- G. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance.
 - 1. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive dry film thickness equivalent to that of flat surfaces.
 - 2. Number of coats specified herein are minimum to be applied.
 - a. Apply additional coats in event full coverage is not obtained or required total thickness of paint does not comply with mil thickness recommended by paint manufacturer.
- H. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces.
- I. Included Work:
 - 1. Finish tops, bottoms, and edges of doors same as balance of door.
 - 2. Where walls are specified to be painted, include columns, arises, reveals, soffits, returns, and like surfaces.
- J. Priming:
 - 1. Where shop coats and touch-up painting are specified under other sections of Work, omit prime coat.
- K. Completed Work:
 - 1. Match approved samples for color, texture, and coverage.
 - 2. Remove, refinish, or repaint work not in compliance with specified requirements.

3.05 CLEANING AND PROTECTION

- A. Cleaning:
 - 1. At end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from Project Site.
 - 2. Remove paint, varnish and brush marks from glazing material
 - 3. Upon completion of painting work, wash and polish glazing material both sides.
 - a. Remove and replace glazing material, which has been damaged by painting operations, with new material.
 - 4. Comply with additional cleaning requirements specified in Section 01 7423.
- B. Protection:
 - 1. Protect work of other trades, whether to be painted or not, against damage by painting.
 - 2. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- C. Protect floors and adjacent surfaces from paint smears, spatters, and droppings:
 - 1. Use drop cloths to protect floors.
 - 2. Cover fixtures and mask off areas where required.
- D. Provide "Wet Paint" signs and barricades to protect newly painted finishes.
 - 1. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- E. At completion of work of other trades, touch-up and restore damaged and defaced painted surfaces.

3.06 PAINT SYSTEM SCHEDULES – GENERAL

- A. Provide following paint systems for substrate indicated.
 - 1. Products must meet or exceed current applicable regulations of agencies listed in Regulatory Requirements Article.

3.07 SCHEDULE OF INTERIOR PAINT SYSTEMS

- A. **Paint System Type 26:**
 - 1. Type and Gloss: Semi-Gloss
 - 2. Use: Exposed, interior ferrous metal surfaces indicated, including hollow metal doors, frames, access doors, panels, and other metal surfaces indicated.
 - a. Primer (1st Coat):
 - 1) UGPR00-1 ULTRA-GRIP Premium, Multi-Purpose Primer
 - b. 2nd and 3rd Coats:
 - 1) SWLL50 SPARTAWALL Low Odor, Zero VOC, Interior Semi-Gloss.
- B. **Paint System Type 30:**
 - 1. Type and Gloss: Semi-Gloss
 - 2. Use: Gypsum Board
 - a. Primer (1st Coat):
 - 1) VNPR00-1 VINYLASTIC Premium Interior Wall Sealer
 - b. 2nd and 3rd Coats:
 - 1) SWLL50 SPARTAWALL Low Odor, Zero VOC, Interior Semi-Gloss

END OF SECTION 09 9100

SECTION 10 1400

SIGNAGE

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Furnishing materials, labor, and equipment necessary for completion of signage as indicated on Drawings and as specified.
 - 2. Types of signage include, but is not necessarily limited to following:
 - a. Interior room signs
 - b. Geometric restrooms signs
 - c. Exterior regulation and directional signage.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 32 1723: Pavement Markings; accessible parking striping

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, current edition.
 - 1. Part 2, California Building Code (CBC), Volumes 1 and 2.
 - a. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.

1.03 DEFINITIONS

- A. Accessible Route:
 - 1. Continuous unobstructed path that complies with California Building Code (CBC).
- B. Characters:
 - 1. Letters, numbers, punctuation marks, and typographic symbols.
- C. Circulation Path:
 - 1. Exterior or interior way of passage from one place to another for pedestrians, including, but not limited to, walks and hallways.
- D. Common Use:
 - 1. Interior and exterior rooms, spaces, or elements made available for occupancy by students, staff, or others visiting or utilizing facilities.
- E. Facility:
 - 1. Portions of buildings, structures, equipment, walks, passageways, or other real or property located on Project Site.
- F. ISA:
 - 1. International Symbol of Accessibility

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- G. Pictogram:
 - 1. Pictorial symbol, which is recognized as representing activities, facilities, or concepts.
- H. Sign:
 - 1. Architectural element composed of displayed text, symbolic, tactile or pictorial information.
- I. Space:
 - 1. Definable area, such as room, toilet room, hall, entrance, storage room, or lobby.
- J. Tactile:
 - 1. Object that can be perceived through sense of touch.

1.04 SYSTEM DESCRIPTION

- A. Comply with most stringent requirements of CBC, current edition, Chapter 11B for following:
 - 1. Tactile character type and size.
 - 2. Finish and contrast.
 - 3. Raised and visual characters.
 - 4. Visual character and line spacing height and installation height.
 - 5. Braille:
 - a. Use California (Contracted) Grade 2 Braille wherever Braille is required.
 - 6. Tactile sign installation height and location.
 - 7. Parking lot entrance signs and accessible parking space identification signs.
 - 8. Identify accessible building entrances with ISA per CBC Section 11B-216.6.
 - 9. Identify each permanent room and space required to be identified by sign with sign installed adjacent to door it identifies, with raised characters and Braille.

1.05 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's technical data and installation instructions for each type of sign required.
- B. Samples:
 - 1. Each sign form and material showing finishes, colors, surface textures and qualities of manufacturer and design of each sign component including graphics.
 - a. Full-size sample units, when requested by Architect.
 - b. Acceptable units may be installed as part of Work.
- C. Shop Drawings:
 - 1. For fabrication and erection of signs.
 - a. Include plans, elevations, and large scale details of sign wording and lettering layout.
 - b. Show anchorages and accessory items.
 - c. Furnish location template drawings for items supported or anchored to permanent construction.
 - d. Furnish full-size spacing templates for individually mounted letters.

1.06 QUALITY ASSURANCE

- A. Uniformity of Manufacturer:
 - 1. For each separate type of sign required, obtain signs from one source from single manufacturer.
- B. Accessibility:
 - 1. Comply with CBC, Chapter 11B.
 - a. Provide tactile exit signage complying with CBC Section 1013.4.

PART 2 PRODUCTS

2.01 GENERAL

- A. Letter Style:
 - 1. Helvetica Medium, unless indicated otherwise..
 - 2. Upper Case Letters only.

2.02 PLASTIC SIGNS

- A. Basis-of-Design:
 - 1. Design for interior plastic room signs is based on Best Sign Systems standard HC 300 ADA System plaque signs and accessories as manufactured by Best Plastics, Inc., Montrose, CO.
- B. Subject to compliance with specified requirements, comparable products may be submitted by alternate manufacturers in accordance with requirements for product substitutions specified in Section 01 6000 and following:
 - 1. Submit items listed in "Submittals" Article and as specified in Section 01 3300, for evaluation of proposed system.
 - 2. Complete project shop drawings for similar project may be submitted for evaluation purposes, however shop drawings specific to this Project will be required from successful bidder.
 - 3. Copy of manufacturer's finish and material warranty.
- C. Material:
 - 1. Plaque stock of laminated phenolic and melamine plastic (MP) for interior signs and fiberglass (FP) for exterior signs suited for graphic sandblast process.
 - 2. Sign stock with face and core plies suited for integral raised profile of text and braille, in finishes and color combinations indicated or, when not indicated, as selected from manufacturer's standards.
 - 3. NEMA rated self-extinguishing.
 - 4. Thickness: 1/4 inch.
 - 5. Edges: Square cut.
 - 6. Corners: As indicated on Drawings.
- D. Finish and Contrast:
 - 1. Matte finish with color of characters and symbols contrasting with background by minimum of 70 percent, and have non-glare finish per CBC Sections 11B-703.5.1, 11B-703.6.2, and 11B-703.7.1
 - 2. Colors as selected by Architect.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- E. Raised (Tactile) and Visual Characters:
1. Provide raised characters minimum of 5/8 inch and maximum of 2 inches high, based on height of uppercase letter "I", complying with CBC Sections 11B-703.2 and 11B-703.2.5
 - a. Accompanied by California Contracted Grade 2 Braille complying with CBC Section 11B-703.2.
 2. Proportions:
 - a. Select Characters from fonts where width of uppercase letter "O" is 60 percent minimum and 110 percent maximum of height of uppercase letter "I" per CBC Sections 11 B-703.4 and 11 B-703.6
 3. Format:
 - a. Horizontal Text Format per CBC Sections 11 B-703.2 and 11 B-703.5
 4. Stroke Thickness:
 - a. Stroke thickness of uppercase letter "I" – 15 percent maximum of height of character per CBC Section 11 B-703.4 and 11B-703.6
 5. Raised Character and Line Spacing:
 - a. Measure character spacing between two closest points of adjacent raised characters within message, excluding word spaces.
 - b. Where characters have rectangular cross sections, make spacing between individual raised characters 1/8 inch minimum and 4 times raised character stroke width maximum.
 - c. Where characters have other cross sections, make spacing between individual raised characters 1/16 inch minimum and 4 times raised character stroke width maximum at base of cross sections, and 1/8 inch minimum and 4 times raised character stroke width maximum at top of cross sections.
 - d. Separate Characters from raised borders and decorative elements 3/8 inch minimum.
 - e. Make spacing between baselines of separate lines of raised message at 135 percent minimum and 170 percent maximum of raised character height per CBC Section 11 B-703.2
 6. Visual Character and Line Spacing:
 - a. Measure visual character spacing on between two closest points of adjacent characters, excluding word spaces.
 - b. Make spacing between individual characters at 10 percent minimum and 35 percent maximum of character height.
 - c. Make spacing between the baselines of separate lines of characters within message at 135 percent minimum and 170 percent maximum of character height per CBC Section 11B-703.5
 7. Visual Character Height and Installation Height:
 - a. Minimum character height complying with CBC Table 11 B-703.5.5
 8. Measure viewing distance as horizontal distance between character and obstruction preventing further approach towards sign.
 9. Base character height on uppercase letter "I".
 - a. Install visual characters at 40 inches minimum above finish floor or ground except for elevator car controls, floor-level exit signs and emergency procedures information per CBC Section 11 B-703.5.
 10. Visual Character Case and Style:
 - a. Visual Characters on Sign:
 - 1) Uppercase or lowercase or combination of both and conventional in form.

- b. Characters:
 - 1) Not to be italic, oblique, script, highly decorative, or of other unusual forms per CBC Section 11 B-703.5
 - 11. Visual Character Stroke Thickness:
 - a. Stroke thickness of uppercase letter "I": 10 percent maximum of height of character per CBC Section 11 B-703.5
 - 12. Provide pictograms, where required, complying with CBC Section 11B-703.6.
 - 13. Symbol of accessibility (ISA): Comply with CBC Section 11B-703.7.
- F. Braille:
- 1. Use California (Contracted) Grade 2 Braille wherever Braille is required, complying with CBC Sections 11B-703.3 and 11B-703.4
 - 2. Braille Dots:
 - a. Locate 0.100 inch on center in each cell with 0.300 inch space between cells, measured from second column of dots in first cell to first column of dots in second cell.
 - b. Raised minimum of 0.025 inch above background.
 - c. Domed or rounded per CBC Sections 11B-703.3 and 11B-703.3.1
 - 3. Position Braille below corresponding text in horizontal format, flush left or centered.
 - 4. Place Multi-lined text, Braille below entire text.
 - 5. Separate Braille 3/8 inch minimum and 1/2 inch maximum from other tactile characters, and 3/8 inch minimum from raised borders and decorative elements. per CBC Section 11 B-703. 3
- G. Applied copy is not acceptable.
- H. Geometric Toilet Room Signs:
- 1. Comply with CBC Section 11B-703.7.2.6
 - 2. Fabricated of 1/4 inch thick, non-glare material contrasting with restroom door (light to dark, or dark to light).
 - 3. Boys/Mens Rooms:
 - a. Triangular with equal sides, 12 inches in length.
 - 4. Girls/Women Rooms:
 - a. Circle, 12 inch in diameter.
 - 5. When restroom or other sanitary facility is accessible, place ISA in center of geometric sign.
 - 6. Non-tactile text, such as "Staff Only", may be added to sign.
 - 7. Install signs on door leading into restroom or other sanitary facility, centered on door, with center of sign 60 inches from finished floor.
- I. Provide Plastic Signs as indicated in schedule and details.

2.03 PARKING LOT ENTRANCE AND ACCESSIBLE PARKING SPACE IDENTIFICATION SIGNS

- A. Sign Requirements:
- 1. Parking Lot Entrance Signs:
 - a. Comply with CBC Chapter 11B, warning that cars parked in parking spaces reserved for people with disabilities will be towed.
 - 2. Identify parking spaces reserved for people with disabilities with reflective sign featuring ISA, complying with CBC, Chapter 11B.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- a. Identify van-accessible spaces by including term "Van Accessible" below pictogram on same sign, or install separate sign with words below ISA sign.per CBC Section 11B-502.6
- B. Sign Fabrication:
 1. Fabricate signs of 3M Scotchlite Brand reflective sheeting laminated to 18 gage galvanized heavy-duty steel.
 2. Size:
 - a. Minimum 17 inches x 22 inches.
 3. White reflective graphics on dark blue reflective background.
 4. Character Styles and Proportions:
 - a. Minimum of one inch high.
 5. Provide with ISA, minimum 8 inches high.
 6. Posts:
 - a. Provide 0.050 inch thick aluminum, or 14 gage galvanized steel, square tube, 2-1/4 inches square, punched.
 - b. Furnish with corrosion and tamper resistant fasteners.
- C. Sign Installation and Mounting:
 1. Install Parking Lot Entrance Signs on wall or pole in conspicuous place at each entrance to off-street parking facilities, or immediately adjacent to, and visible from each accessible stall or space.
 2. Install Parking Space Signs as follows:
 - a. On wall or pole at head of each accessible parking space.
 - b. In public way, with bottom edge of sign minimum of 80 inches above pavement or ground.
 - c. In planting area, parking strip, or on wall, with bottom edge of sign minimum of 60 inches above pavement or ground.
- D. Painting and Striping:
 1. Identify reserved parking spaces with ISA at foot of space in compliance with CBC, Chapter 11B.
 - a. Stripe access aisles as required.
 2. Perform painting and striping in accordance with requirements in Section 32 1723.

2.04 INFORMATIONAL SIGNS

- A. Room Identification Signs:
 1. Identify each permanent room and space required to be identified by sign with sign installed adjacent to door it identifies, with raised characters and Braille.
 - a. This includes entrances to rooms and spaces, which are entered by exterior entrance or by door off interior corridor or courtyard, per CBC Chapter 11B.
 2. Toilet Room Identification Signs:
 - a. Include gender pictogram in 6 inch high field.
 - b. Locate pictogram field above raised character and Braille text on tactile sign, which is to be located adjacent to latch side of the door, per CBC Chapter 11B.
 - c. Where there is not adequate space for sign immediately adjacent to door, and door opens inward, gender pictogram, ISA, and raised characters and Braille can be included on geometric sign installed on door.
 - 1)

PART 3 EXECUTION

3.01 INSTALLATION

- A. General – Locate sign units and accessories where shown, scheduled, or directed by Architect.
 - 1. Use mounting methods shown or selected by Architect.
 - 2. Comply with manufacturer's instructions, and CCR, Title 24, Part 2, CBC Chapter 11 B.
- B. Install level, plumb, and at proper height with sign surfaces free from distortion or other defects in appearance.
 - 1. Cooperate with other trades for installation to finish surfaces.
 - 2. Repair or replace damaged units as directed by Architect.
- C. Tactile Sign Installation Height and Location:
 - 1. Locate tactile characters on signs minimum of 48 inches above finish floor or ground surface, measured from baseline of lowest Braille cells and 60 inches maximum above finish floor or ground surface, measured from baseline of highest line of raised characters.
 - 2. Locate tactile signs on approach side of door at entry or exit, and allow for reach within 0 inches of required clear floor space per CBC Section and Figure 11B-703.4.2.
 - a. Where tactile sign is provided at door, locate sign on wall alongside door at latch side.
 - b. When at double doors with one active leaf, locate sign on inactive leaf.
 - c. When at double doors with two active leafs, locate sign to right of right hand door.
 - d. Where there is no wall space at latch side of single door or at right side of double doors, locate signs on nearest adjacent wall.
 - e. Locate signs containing tactile characters so that clear floor space of 18 inches minimum by 18 inches minimum, centered on tactile characters, is provided beyond arc of door swing between closed position and 45 degree open position per CBC Section 11 B-703.4
- D. Plastic Signs:
 - 1. Mount sign with aluminum T-type bracket, finish to match adjacent surface or adhesive mount with adhesive recommended by sign manufacturer for application to substrate.
 - 2. Locate signs so that person may approach within 3 inches of sign without encountering protruding objects or standing within swing of door per CBC Chapter 11B.

3.02 CLEANING AND PROTECTION

- A. At completion of installation, clean soiled sign surfaces in accordance with manufacturer's instructions.
 - 1. Protect units from damage until acceptance by Owner.

END OF SECTION 10 1400

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 10 2813

TOILET ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Toilet Accessories.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 07 9200: Joint Sealants
 - 3. Section 09 2900: Gypsum Board
 - 4. Section 10 2117: Solid Phenolic Toilet Compartments
- C. Related Requirements:
 - 1. Refer to Division 22 Sections for related plumbing fixtures and installation.
 - 2. Underlavatory guards are specified in Division 22.
- D. Schedule of Toilet Accessories:
 - 1. Each type of toilet accessory required is specified in Schedule of Toilet Accessories at end of this Section.
- E. Refer to Drawings for location of Owner Furnished/Contractor Installed (OF/CI) accessories.

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition.
 - 1. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.
- B. ASTM International (ASTM):
 - 1. ASTM A 153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 2. ASTM A167 – Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
 - 3. ASTM A 653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 4. ASTM A 666 – Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
 - 5. ASTM A 1008 – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
 - 6. ASTM B 16 – Standard Specification for Free-Cutting Brass Rod, Bar and Shapes for Use in Screw Machines
 - 7. ASTM B 19 – Standard Specification for Cartridge Brass Sheet, Strip, Plate, Bar, and Disks
 - 8. ASTM B 30 – Standard Specification for Copper Alloys in Ingot Form

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

9. ASTM F 446 – Standard Consumer Safety Specification for Grab Bars and Accessories Installed in the Bathing Area
10. ASTM B 456 – Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

1.03 SUBMITTALS

- A. Product Data:
 1. Include construction details, material descriptions, thicknesses, dimensions, profiles, fastening, and mounting methods, specified options, and finishes for each type of accessory specified.
- B. Samples:
 1. Full-size samples of units, upon request, to Architect for review of design and operation.
 2. Acceptable samples will be returned and may be used in Work.
 3. Compliance with other requirements is exclusive responsibility of Contractor.
- C. Setting Drawings:
 1. Showing cutouts required in other Work.
 2. Include templates, substrate preparation instructions, and directions for preparing cutouts and installing anchoring devices.
- D. Operation and Maintenance Data:
 1. Maintenance data, operating instructions and keys required for each type of equipment and lock or accessories to include in maintenance manuals specified in Division 01.
 2. Provide lists of replacement parts and service recommendations.

1.04 QUALITY ASSURANCE

- A. Accessory requirements, including those for materials, finishes, dimensions, capacities, and performance, are established by specified products indicated in Toilet Accessory Schedule.
 1. Do not modify aesthetic effects, as judged solely by Architect, except with Architect's approval.
 2. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver items in manufacturer's original unopened protective packaging.
- B. Store materials in original protective packaging to prevent soiling, physical damage, or wetting.
- C. Handle so as to prevent damage to finished surfaces.
- D. Maintain protective covers on units until installation is complete.
 1. Remove covers at final clean up of installation.

1.06 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying Work.

1.07 WARRANTY

- A. General Warranty:
 - 1. Special warranty specified in this Article does not deprive Owner of other rights Owner may have under other provisions of Contract Documents and is in addition to, and runs concurrent with, other warranties made by Contractor under requirements of Contract Documents.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Basis-of-Design:
 - 1. Model numbers specified for toilet accessories are based on products as manufactured by Bobrick Washroom Equipment Inc., North Hollywood, CA.
 - a. Unless indicated otherwise, listed products are District Standard items and substitutions are not permitted.

2.02 MATERIALS – GENERAL

- A. Stainless Steel:
 - 1. Conforming to ASTM A 666, Type 304, with No.4 finish.
 - 2. Minimum 22 gage (0.03125 inch), unless otherwise indicated.
- B. Brass:
 - 1. General:
 - a. Conforming to ASTM B 19, leaded and unleaded.
 - 2. Flat Products:
 - a. Conforming to ASTM B 16
 - 3. Rods, Shapes, Forgings, and Flat Products with Finished Edges:
 - a. Conforming to ASTM B 30 castings.
- C. Sheet Steel:
 - 1. Conforming to ASTM A 1008.
 - a. Cold-rolled, commercial quality 20 gage (0.0359 inch) minimum, unless otherwise indicated.
 - 2. Surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet:
 - 1. Conforming to ASTM A 653, G60.
- E. Chromium Plating:
 - 1. Nickel and chromium electro-deposited on base metal.
 - 2. Conforming to ASTM B 456, Type SC 2.

- F. Galvanized Steel Mounting Devices:
 - 1. Conforming to ASTM A 153, hot-dip galvanized after fabrication.
- G. Fasteners:
 - 1. Screws, bolts, and other devices of same material as accessory unit tamper and theft resistant when exposed, galvanized steel where concealed.

2.03 FABRICATION

- A. General:
 - 1. Stamped names or labels on exposed faces of toilet accessory units are not permitted, except where otherwise indicated
 - 2. Unobtrusive labels on surfaces not exposed to view are acceptable.
- B. Surface-Mounted Toilet Accessories – General:
 - 1. Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled.
 - 2. Hang doors or access panels with continuous stainless steel piano hinges.
 - 3. Provide concealed anchorage wherever possible.
- C. Grab Bars:
 - 1. Stainless steel type with wall thickness not less than 18 gage and as follows:
 - a. Mounting:
 - 1) Concealed, manufacturer's standard flanges and anchorages.
 - b. Gripping Surfaces:
 - 1) Smooth, satin finish, with manufacturer's standard non-slip texture on gripping surface.
 - 2. Heavy-Duty Size:
 - a. Outside Diameter: 1-1/4 inches.
- D. Keys:
 - 1. Provide universal keys for internal access to accessories for servicing and resupplying.
 - 2. Where locks are required for particular type of toilet accessory, provide keyed alike throughout Project.
 - 3. Furnish two keys for each lock and minimum of six keys to Owner's representative.

PART 3 EXECUTION

3.01 INSPECTION

- A. Check wall opening for correct dimensions, plumbness of blocking or frames, and other preparation that would affect installation of accessories.
- B. Check areas to receive surface mounted units for conditions that would affect quality and execution of Work.
- C. Verify spacing of plumbing fixtures and toilet partitions that affect installation of accessories.
- D. Do not begin installation of washroom accessories until openings and surfaces are acceptable to Contractor and Architect.

3.02 INSTALLATION

- A. Install toilet accessory units following manufacturer's instructions, using fasteners appropriate to substrate and recommended by unit manufacturer.
 - 1. Mount toilet accessories required to be accessible in locations and at heights complying with CBC Sections 11B-602 through 11B-612.

- B. Install units plumb, level, and firmly anchored in locations and at heights indicated.
 - 1. Use concealed fastenings wherever possible.
 - 2. Provide anchors, bolts and other necessary anchorages.
 - 3. Install concealed mounting devices and fasteners fabricated of same material as accessories, or of galvanized steel, as recommended by manufacturer.
 - 4. Install exposed mounting devices and fasteners finished to match accessories.
 - 5. Provide theft-resistant fasteners for accessory mountings.
 - a. Finish of exposed fasteners to match items secured.
 - 6. Fit flanges of accessories snug to wall surfaces.
 - a. Provide sealant in gaps between 90 degree return flanges and finish wall surface after accessories are installed.
 - b. Comply with requirements of Section 07 9200 for mildew-resistant silicone sealant
 - 1) Do not use acrylic sealant

- C. Grab Bars in Toilet Facilities:
 - 1. Install grab bars to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.
 - 2. Comply with CBC Section 11B-609.
 - 3. Provide grab bars and wall or other surfaces adjacent to grab bars free of sharp or abrasive elements and with rounded edges.
 - 4. Clearances:
 - a. 1-1/2 inch clearance between wall surface and inside face of bar.
 - b. 1-1/2 inch minimum between grab bar and projecting objects below and at ends.
 - c. 12 inches minimum between grab bar and projecting objects above point of grab bar.
 - 5. Toilet paper and feminine napkin disposals when located on grab bar side of accessible toilet room or stall are not to project more than 3 inches from finished wall surface nor be located closer than 1-1/2 inches clear of tangent point of grab bar.
 - a. Do not install surface mounted accessories above grab bar where they will restrict usability.

- D. Conceal evidence of drilling, cutting and fitting on adjacent finishes.

3.03 ADJUSTING AND CLEANING

- A. Adjust accessories for proper operation and verify that mechanisms function smoothly.
 - 1. Replace damaged or defective items.

- B. Clean and polish exposed surfaces following manufacturer's recommendations after removing temporary labels and protective coatings.

3.04 CLOSE OUT

- A. Deliver accessories schedule, keys, and parts manual as part of Project Closeout Documents.
- B. For Owner's permanent records, provide two sets of following items of manufacturer's literature:
 - 1. Technical data sheets of each item installed on Project.
 - 2. Service and parts manuals.
 - 3. Name and local representative to be contacted in event of need for field service or consultation.

3.05 SCHEDULE OF TOILET ACCESSORIES

- A. Provide toilet accessories equal to Bobrick Model Numbers listed below unless indicated otherwise:
 - 1. Toilet Tissue Dispenser:
 - a. Surface Mounted Multi-Roll:
 - 1) No. B-2888.
 - 2. Sanitary Napkin Disposal:
 - a. Surface Mounted:
 - 1) No. B-254.
 - 3. Seat Cover Dispenser:
 - a. Surface Mounted:
 - 1) No. B-221.
 - 4. Grab Bar:
 - a. No. B-5806.99 Series with non-slip texture gripping surface.

END OF SECTION 10 2813

SECTION 11 6818

INSTALLATION OF PLAY STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Furnishing labor, material, and equipment necessary for installation of play structures and shade structures, as shown on Drawings.

- B. Work includes, but is not necessarily limited to following:
 - 1. Excavation, in accordance with requirements of Section 31 0000.
 - 2. Layout
 - 3. Including appurtenances and accessories required for full and complete installation.

- C. Related Sections:
 - 1. Section 01 1100: Summary of Work
 - 2. Section 01 4100: Regulatory Requirements; current Code edition.
 - 3. Section 31 0000: Earthwork; excavation requirements.
 - 4. Section 32 1818: Playground Surfacing Tiles

1.02 REFERENCES

- A. California Code of Regulations (CCR):
 - 1. Title 22, Social Security
 - a. Division 4 – Environmental Health
 - 1) Chapter 22 – Safety Regulations for Playgrounds
 - 2. Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition.
 - a. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.

- B. ASTM International (ASTM):
 - 1. ASTM F 1487 – Standard Consumer Safety Performance Specification for Playground Equipment for Public Use

- C. Consumer Product Safety Commission (CPSC):
 - 1. Public Playground Safety Handbook

- D. International Playground Equipment Manufacturers Association (IPEMA):
 - 1. IPEMA Certification Program

- E. National Recreation and Park Association (NRPA):
 - 1. Certified Playground Safety Inspector (CPSI) certification program

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- F. International Standards Organization (ISO):
 - 1. ISO 9001 – Quality Management Systems
 - 2. ISO 14001 – Environmental Management System Standard

1.03 SUBMITTALS

- A. Product Data:
 - 1. Detailed component list with model numbers and catalog descriptions.
 - 2. Manufacturer's written installation instructions.
 - 3. Written material specifications for each component to be provided.
- B. Shop Drawings:
 - 1. Plan view drawings with model numbers and descriptive labels
 - a. Include component names, deck heights, and notations of compliance with referenced and regulatory requirements.
- C. Certifications:
 - 1. Certification certificate from IPEMA.
 - 2. Manufacturer's ISO 9001 and ISO 14001 Certifications
- D. Manufacturer's warranty in certificate form.

1.04 QUALITY ASSURANCE

- A. Quality Certifications:
 - 1. Manufacturer's Qualifications:
 - a. Certified in accordance with ISO 9001 and ISO 14001
 - 2. Equipment Certifications:
 - a. Certify that public playground equipment supplied for this Project is certified to ISO 9001 and IPEMA standards.
 - b. Furnish playground equipment products bearing certification seal of IPEMA.
- B. Installer Qualifications:
 - 1. Experienced installer who has completed Work with equipment, materials, and design, similar to this Project.
 - a. Whose work has resulted in construction with record of successful in-service performance.
 - 2. Certified by manufacturer of play structures and employs installation crew leader who is CPSI certified.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Materials to be delivered in original, new, unopened packages and containers, bearing manufacturer's name and labels identifying contents.
 - 1. Maintain labels intact until completion of installation.
 - 2. Inspect parts at point of delivery, compare with manufacturers bill of material, and report missing or non-conforming parts to manufacturer.
- B. Store material on Project Site during installation
 - A. Provide protection as required by manufacturer to protect from damage during storage.
 - B. After installation, protect play structures during remaining construction operations to prevent damage, theft, or vandalism.

- C. During this period, touch-up and repair or replacement is at Contractor's expense.
- C. Cleaning:
 - A. Clean exposed surfaces complying with manufacturer's recommendations and instructions, and requirements specified in Section 01 7423.

1.06 REGULATORY REQUIREMENTS

- A. Design Requirements:
 - 1. Design of specified products meeting or exceeding requirements of CCR:
 - a. Title 22, Division 4, Chapter 22
 - b. Title 24, CBC Part 2, Chapter 11B.
- B. Comply with regulations and standards of following:
 - 1. ASTM F 1487
 - 2. CPSC Public Playground Safety Handbook
 - 3. IPEMA Certification Program
 - 4. NRPA CPSI certification program
 - 5. ISO 9001 and ISO 14001

1.07 WARRANTY

- A. Manufacturer's Warranty:
 - 1. Warrant material and workmanship against defects, from date of Substantial Completion of Project, for period of time as follows:
 - a. Limited One Hundred Year Warranty:
 - 1) Against structural failure due to weather corrosion or defects in materials and workmanship on aluminum deck posts, steel deck posts, clamping/fastening, and associated fastening hardware.
 - b. Limited One Year Warranty:
 - 1) Against structural failure due to defects in materials and workmanship for products and components that are not specifically listed above, including, without limitation, moving parts such as swing hangers, swivels, chains, whirls, trolleys and flexible climbers.
 - 2. Repaired or replacement parts are only warranted for balance of original limited warranty
 - 3. Limited warranties do not include fading of colors, damage due to excessive wear and tear, vandalism, or negligence.
 - 4. Warranties are valid only if products are installed according to manufacturer's installation instructions.
- B. Installer's Warranty:
 - 1. Guarantee installation workmanship for period of one year from date of Substantial Completion.
 - 2. Installation contractor is responsible for coordinating manufacturer material warranty items with the manufacturer/distributor and for installation of replacement materials at no additional cost to Owner.
 - 3. Furnish copy of Contractor's installation warranty on company letterhead

PART 2 PRODUCTS

2.01 PLAY STRUCTURES

- A. Refer to Drawings for type, style, configuration, size, and height of play structures to be installed.
- B. Refer to Drawings for type, style, configuration, size, and height of shade structures to be installed.

PART 3 EXECUTION

3.01 INSPECTION

- A. Prior to equipment installation, examine substrates and conditions under which equipment is to be installed.
 - 1. Notify Architect in writing of conditions detrimental to proper, complete, and timely completion of Work.
 - 2. Do not proceed with Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Installation Instructions:
 - 1. Manufacturer to furnish explicit, printed installation instructions.
 - a. Instructions to include, but not necessarily limited to following:
 - 1) Detailed, scaled plan views, elevations.
 - 2) Footing drawings and details when applicable.
 - 3) Sequential assembly instructions to ensure proper installation of playground equipment and structures.
- B. Installer Requirements:
 - 1. Equipment must be installed by manufacturer-certified installer in accordance with manufacturer's installation instructions.
 - 2. Employ CPSI-Certified crew leader to supervise installation.
 - 3. Should CPSI-Certified crew leader not be available, arrange for inspection of installed equipment and structures by CPSI not employed by installer who will sign off on installation before playground is opened for use.
- C. Installation:
 - 1. Assemble equipment that requires pre-assembly prior to start of installation.
 - 2. Install equipment at locations indicated on Drawings.
 - 3. Installation to be level, plumb, and secure and in accordance with manufacturer's recommendations, directions, and detail drawings.
 - 4. Cooperate with associated trades.

3.03 MAINTENANCE MANUALS

- A. Manufacturer's Responsibilities:
 - 1. Include two sets of installation manuals with each order/delivery.
 - 2. Send one complete set of installation instructions directly to Owner
- B. Contractor's Responsibilities:
 - 1. Secure installation instructions from installer.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- a. Purchase additional sets of installation instructions from manufacturer if originals are lost or damaged.
 2. Furnish Owner with one copy of complete manufacturer's installation instructions and maintenance kit at no cost to Owner.
- C. Comply with additional requirements for Project Closeout in accordance with Section 01 7700.

3.04 CLEANING

- A. Maintain Project Site clean and free of tools, trash, debris, and installation materials on daily basis and in accordance with requirements of Section 01 7423.

3.05 PROTECTION

- A. Protect entire installation from damage blemishes, or indication of use, until completion and acceptance of Project by Owner.
1. If necessary, provide barricades or temporary fencing complying with requirements of Section 01 5000.

END OF SECTION 11 6810

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 31 0000

EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Materials, equipment, and labor required to provide grading and fine grading as indicated on Drawings and as specified.
 2. Work includes, but may not be limited to:
 - a. Excavation, compacted engineered fill, and preparing of subgrade for building footings, slabs, walks, and pavements.
 - b. Excavating and backfilling of trenches and excavations.
 3. Geotechnical Data reference and information.
- B. Related Sections:
1. Section 01 4100: Regulatory Requirements; current Code edition.
 2. Section 01 4500: Quality Control; soil testing requirements
 3. Section 01 5000: Temporary Facilities and Controls; barriers and temporary controls.
 4. Section 01 5713: Temporary Erosion and Sedimentation Controls
 5. Section 02 4113: Selective Site Demolition
 6. Section 32 0117: Asphalt Paving Repair
 7. Section 32 1100: Base Course; base material under paving.
 8. Section 32 1313: Concrete Paving
- C. Related Requirements:
1. Excavating and Backfilling for Utility Work:
 - a. Refer to Division 26 Sections for excavation and backfill required for underground electrical utilities and related buried appurtenances.
 - b. Refer to Division 33 Sections for additional trenching and backfilling requirements for underground site utilities piping and related buried appurtenances.

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, current edition of California Building Code (CBC), Part 2, Volumes 1 and 2.
- B. ASTM International (ASTM):
1. ASTM D 448 – Standard Classification for Sizes of Aggregate for Road and Bridge Construction
 2. ASTM D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))
 3. ASTM D 2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
 4. ASTM E 699 – Standard Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components
- C. American Association of State Highway and Transportation Officials (AASHTO):

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

1. AASHTO – Standard Specifications for Highway Materials and Methods of Sampling and Testing.
- D. State of California Department of Transportation (Caltrans):
 1. Standard Specifications:
 - a. Division IV – Subbases and Bases
 - 1) Section 26 – Aggregate Bases.
- E. Public Works Standards, Inc.:
 1. Standard Specifications for Public Works Construction (SSPWC):
 - a. The "Greenbook"; current edition.
 2. Standard Plans for Public Works Construction (SPPWC); current edition.

1.03 DEFINITIONS

- A. Excavation:
 1. Consists of removal of material encountered to subgrade elevations indicated and subsequent use of excavated material as fill, disposal off-site, or stockpiled for future use of materials removed.
- B. Unauthorized Excavation:
 1. Consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect.
 2. Unauthorized excavation, as well as remedial work directed by Civil Engineer upon receipt of written authorization from Architect, will be at Contractor's expense.
 3. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation.
 - a. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Civil Engineer.
 4. In locations other than those above, backfill and compact unauthorized excavations as specified by Civil Engineer for authorized excavations of same classification, unless otherwise directed by Architect.
- C. Additional Excavation:
 1. When excavation has reached required subgrade elevations, notify Architect, who will notify Geotechnical Engineer to make inspection of conditions.
 2. Should Geotechnical Engineer determine that bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material specified by Civil Engineer and directed by Architect.
 3. Contract sum may be adjusted by appropriate Contract modification.
 4. Removal of unsuitable material and its replacement as directed will be paid on basis of General Conditions of the Contract relative to changes in Work.
- D. Subgrade:
 1. Undisturbed earth or compacted soil layer immediately below granular sub-base, drainage fill, or topsoil materials.

1.04 SUBMITTALS

- A. Test Reports:
 - 1. Submit following reports directly to Architect from testing services, with copy to Contractor:
 - 2. Test reports on borrow material.
 - 3. Verification of suitability of each footing subgrade material, in accordance with specified requirements.
 - 4. Field Reports:
 - a. In-place soil density tests.

1.05 QUALITY ASSURANCE

- A. Codes and Standards:
 - 1. Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
- B. Testing and Inspection Service:
 - 1. Owner will employ and pay for qualified independent geotechnical testing laboratory to perform soil testing and inspection service during earthwork operations.
- C. Testing Laboratory Qualifications:
 - 1. To qualify for acceptance, geotechnical testing laboratory must be Division of the State Architect (DSA) approved and demonstrate to Architect's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, that it has experience and capability to conduct required field and laboratory geotechnical testing without delaying progress of Work.
- D. Foundation Soils:
 - 1. Excavate for foundations to sizes indicated, clean and leave in condition recommended by Civil Engineer.
 - 2. Prior to placement of forms, reinforcing or concrete, obtain approval of Civil Engineer and DSA Project Inspector as required, for proper conditions and suitable bearing materials.

1.06 PROJECT CONDITIONS

- A. Noise and Dust Abatement:
 - 1. Exercise reasonable and necessary means to abate dust, dirt rising and undue noise.
 - a. Perform necessary sprinkling and wetting of construction site to allay dust.
- B. Existing Utilities:
 - 1. Locate existing underground utilities in areas of excavation work.
 - 2. Where utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
 - 3. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for direction.
 - 4. Cooperate with Owner and utility companies in keeping respective services and facilities in operation.
 - a. Repair damaged utilities to satisfaction of utility owner.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

5. Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by Architect and then only after acceptable temporary utility services have been provided.
 - a. Provide minimum of forty-eight hour notice to Architect and Owner and receive written notice to proceed before interrupting utility.
 6. Demolish and completely remove from Project Site existing underground utilities indicated to be removed.
 - a. Perform backfilling for abandoned underground utilities conforming to Articles 2.01 – Soil Materials and 3.05 – Backfill and Fill of SSPWC.
 - b. Coordinate with utility companies for shutoff of service if lines are active.
- C. Protection of Subgrade:
1. Do not allow equipment to pump, rut or disturb subgrade, stripped areas, or other areas prepared for backfill or paving operations.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

- A. Imported Soil Materials:
1. Fill soil imported to Project Site:
 - a. Granular, with expansion index of less than twenty.
 - b. Classified as SM, SW, and SP in accordance with ASTM D 2487.
 2. Import Fill:
 - a. Free of rock and lumps of soil larger than three inches in diameter.
 - b. Be at least sixty percent finer than 1/4 inch sieve.
- B. Utility Trench Backfill:
1. Provide material for use in backfilling trenches consisting of hard, durable, clean sand, gravel, or crushed stone.
 - a. Free from organic material, clay balls, or other deleterious substances.
- C. Engineered Fill:
1. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand:
 - a. With at least 90 percent passing 1-1/2-inch sieve and not more than 12 percent passing No. 200 sieve.
 - b. Comply with Caltrans Standards where applicable.

2.02 BASE MATERIALS

- A. Subbase:
1. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand:
 - a. With at least 90 percent passing 1-1/2 inch sieve and not more than 12 percent passing No. 200 sieve.
 - b. Comply with Caltrans Standards where applicable.
- B. Base:
1. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand:
 - a. With at least 95 percent passing 1-1/2 inch sieve and not more than 8 percent passing No. 200 sieve for Class II Base.

- C. Bedding:
 - 1. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand:
 - a. Except with 100 percent passing 1 inch sieve and not more than 8 percent passing No. 200 sieve.
- D. Drainage Course:
 - 1. Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel:
 - 2. Complying with ASTM D 448:
 - a. Coarse-aggregate gradation:
 - b. Size:
 - 1) No. 57 with 100 percent passing 1-1/2 inch sieve and 0 to 5 percent passing No. 8 sieve.

PART 3 EXECUTION

3.01 EXCAVATION

- A. Excavation Classifications:
 - 1. Following classifications of excavation will be made when rock is encountered:
 - a. Earth excavation includes excavation of pavements and other obstructions visible on surface, including but not necessarily limited to:
 - 1) underground structures and utilities
 - 2) Other items indicated to be demolished and removed.
 - a) Along with with earth and other materials encountered that are not classified as rock or unauthorized excavation.

3.02 STABILITY OF EXCAVATIONS

- A. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction.
 - 1. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
 - 2. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

3.03 STORAGE OF EXCAVATED MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill where directed.
 - 1. Place, grade and shape stockpiles for proper drainage.
 - 2. Locate and retain soil materials horizontally away from edge of excavations equal to depth of excavation.
 - 3. Do not store within drip line of trees indicated to remain.
 - 4. Dispose of excess excavated soil materials not acceptable for use as backfill or fill.

3.04 TRENCH EXCAVATION FOR PIPES AND CONDUIT

- A. Excavate trenches to uniform width, sufficiently wide to provide ample working room and minimum of six to nine inches of clearance on both sides of pipe or conduit.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- B. Excavate trenches and conduit to depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil.
1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
 2. Where rock is encountered, carry excavation six inches below required elevation and backfill with six inch layer of crushed stone or gravel prior to installation of pipe.
 3. For pipes or conduit less than six inches in nominal size, and for flat-bottomed, multiple-duct conduit units, do not excavate beyond indicated depths.
 - a. Hand-excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
 4. For pipes and equipment six inches or larger in nominal size, shape bottom of trench to fit bottom of pipe for ninety degrees (bottom 1/4 of circumference).
 - a. Fill depressions with tamped sand backfill.
 - b. At each pipe joint, dig bell holes to relieve pipe bell of loads to ensure continuous bearing of pipe barrel on bearing surface.

3.05 BACKFILL AND FILL

- A. Fill Material and Backfill Material:
1. Consisting of satisfactory soil material or imported soil materials as specified in Part 2 of this section.
 - a. Place in maximum six inch thick compacted layers to required subgrade elevations, except as follows:
 - 1) Under Walks:
 - a) Upper four inches of fill shall consist of sub-base as defined in Article 2.01 C 1, or base material as defined in Section 32 1100.
 - 2) Under Interior Building Slabs:
 - a) Upper four inches of fill shall consist of compactable sand or rock as specified in Article 2.01A.
 - b. Under Piping and Conduit and Equipment:
 - 1) Use sub-base materials where required over rock bearing surface and for correction of unauthorized excavation.
 - 2) Shape excavation bottom to fit bottom ninety degrees of cylinder.
 - c. Backfill trenches with concrete where trench excavations pass within eighteen inches of column or wall footings and that are carried below bottom of such footings or that pass under wall footings.
 - 1) Place concrete to level of bottom of adjacent footing.
 - 2) Concrete is specified in Section 03 3000.
 - 3) Do not backfill trenches until tests and inspections have been made and backfilling is authorized by Architect.
 - 4) Use care in backfilling to avoid damage or displacement of pipe systems.
- B. Backfill excavations as promptly as Work permits, but not until completion of following:
1. Acceptance of construction below finish grade.
 2. Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded.
 3. Removal of:
 - a. Concrete formwork.

- b. Shoring and bracing, and backfilling of voids with satisfactory materials.
 - c. Trash and debris from excavation.
4. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

3.06 PLACEMENT AND COMPACTION

- A. Ground Surface Preparation:
1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills.
 2. Plow strip or break up sloped surfaces steeper than one vertical to four horizontal (1:4) so that fill material will bond with existing surface.
 3. When existing ground surface has density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content or slightly above, and compact to required depth and percentage of maximum density.
 4. Where unsuitable material described above, is greater than twelve inches thick, material will have to be removed and recompacted as directed by Civil Engineer.
- B. Place backfill and fill materials in layers not more than eight inches in loose depth for material compacted by heavy compaction equipment, and not more than four inches in loose depth for material compacted by hand-operated tampers.
- C. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content or slightly above.
1. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification.
- D. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations.
1. Prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.
- E. Control soil and fill compaction, providing minimum percentage of density specified for each area classification indicated below.
1. Correct improperly compacted areas or lifts as directed by Architect if soil density tests indicate inadequate compaction.
 2. Percentage of Maximum Density Requirements:
 - a. Compact soil to not less than the following percentages of maximum density, in accordance with ASTM D 1557:

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- b. Under Foundations, Building Slabs and Steps:
 - 1) Compact top eighteen inches of subgrade and each layer of backfill or fill material at ninety percent maximum density.
- c. Under Pavements:
 - 1) Compact top twelve inches of subgrade and each layer of backfill or fill material at ninety percent maximum density.
- d. Under Lawn or Unpaved Areas:
 - 1) Compact top six inches of subgrade and each layer of backfill or fill material at eighty percent maximum density.
- e. Under Walkways:
 - 1) Compact top twelve inches of subgrade and each layer of backfill or fill material at ninety percent maximum density.
- 3. Moisture Control, under direction of Civil Engineer:
 - a. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material.
 - b. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.
 - c. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
 - d. Stockpile or spread soil material that has been removed because it is too wet to permit compaction.
 - e. Assist drying by disking, harrowing or pulverizing until moisture content is reduced to satisfactory value.

3.07 GRADING

- A. Uniformly grade areas within limits of grading under this section, including adjacent transition areas.
 - 1. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- B. Grading Outside Building Lines:
 - 1. Grade areas adjacent to building lines to drain away from structures and to prevent ponding.
 - 2. Finish surfaces free from irregular surface changes and as follows:
 - a. Lawn or Unpaved Areas:
 - 1) Finish areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.
 - b. Walks:
 - 1) Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10 foot above or below required subgrade elevation.
 - c. Pavements:
 - 1) Shape surface of areas under pavement to line, grade, and cross-section, with finish surface not more than 1/2 inch above or below required subgrade elevation.

3.08 EROSION CONTROL

- A. Provide erosion control methods in accordance with requirements of authorities having jurisdiction.
 - 1. Comply with additional requirements specified in Section 01 5713,

3.09 MAINTENANCE

- A. Protection of Graded Areas:
 - 1. Protect newly graded areas from traffic and erosion and keep free of trash and debris.
- B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Reconditioning Compacted Areas:
 - 1. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

3.10 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Removal from Owner's Property:
 - 1. Remove waste materials, including unacceptable excavated material, trash, and debris, and legally dispose of it off Project Site.
 - 2. Comply with requirements specified in Section 01 7419.

END OF SECTION 31 0000

SECTION 31 1000

SITE CLEARING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Removal of organic materials, including but not necessarily limited to:
 - a. Vegetation such as:
 - 1) Grass and grass roots.
 - 2) Shrubs
 - 3) Trees, tree roots, tree stumps, and upturned stumps.
 - 4) Weed growth.
 - 5) Brush.
 - b. Additional items not included elsewhere, such as:
 - 1) Rubbish, debris, and other objectionable materials, within limits of Work.
 - c. Provide dust control measures.
 - 1) As required by authorities having jurisdiction.
 2. Conform to work restrictions for archaeology, endangered species, and hazardous materials, when required.
 - a. Provide dust control measures conforming to requirements of Section 01 5000.
 3. Protection of existing materials to remain.
 - a. Includes tree protection fences.
- B. Related Sections:
1. Section 01 4100: Regulatory Requirements; current Code edition.
 2. Section 01 5000: Temporary Facilities and Controls; barriers and temporary controls.
 3. Section 01 5713: Temporary Erosion and Sediment Controls; maintenance of controls during site clearing operations.
 4. Section 31 0000: Earthwork
- C. Related Requirements:
1. Refer to Division 32 Landscaping Sections for additional requirements.

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition.
- B. ASTM International (ASTM):
1. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- C. Public Works Standards, Inc.:
1. Standard Specifications for Public Works Construction (SSPWC):
 - a. The "Greenbook"; current edition.
 2. Standard Plans for Public Works Construction (SPPWC); current edition.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

1.03 SUBMITTALS

- A. Shop Drawings:
 - 1. When requested, provide site plan indicating extent of site clearing.

1.04 QUALITY ASSURANCE

- A. Comply with SSPWC "Greenbook" as minimum requirement.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 TREE AND PLANT PROTECTION – GENERAL

- A. Preserve and protect existing trees and plants at Project Site that are designated to remain, and those adjacent to Project Site.
 - 1. Perform clearing without damage to undergrowth, and ground surfaces which occur outside of areas indicated to be cleared as indicated on Drawings and are to remain undisturbed.
- B. Protect individual trees which lie within areas to be cleared, which are banded and identified to remain, from damage.
 - 1. Provide temporary barriers around each, or around each group of trees or plants.
- C. Trenching Near Trees:
 - 1. Where utility trenches are required near trees, excavate under or around tree roots by hand or with air spade.
 - 2. Do not cut main lateral tree roots or taproots.
 - a. Cut only smaller roots that interfere with installation of utilities.
 - b. Do not allow exposed roots to dry out before placing permanent backfill.
- D. Damaged Trees:
 - 1. Existing trees or permanent planting indicated to remain that are damaged or destroyed by construction operations or storage of material or equipment are to be trimmed and reshaped by tree surgeons, or replaced, each at Contractor's expense and as directed by Architect.
 - 2. Perform trimming and reshaping to satisfaction of Architect/Landscape Architect.
 - 3. Species and size for replacement trees and plantings will be selected by Architect/Landscape Architect.

3.02 TRIMMING OF EXISTING TREES TO REMAIN

- A. Trim roots of trees where uncovered, making clean cuts.
 - 1. Cover cut roots with 4 inches of soil
- B. Prevent damage to tree limbs which project within work areas.
 - 1. Trim or cut only with specific prior approval of Architect or Landscape Architect.
 - 2. Remove dead branches and shape living branches as directed by Landscape Architect.
 - a. Make flush cuts leaving no stubs

- b. Cut back to living tissue where necessary, smooth and shape surfaces to shed water.
- C. Apply tree wound paint on cut surfaces 1 inch diameter and larger when directed by Landscape Architect.

3.03 TREE PROTECTION FENCES

- A. Fence Locations:
 1. Provide and maintain following:
 - a. Tree protection fences around individual trees and groups of trees which are to remain in place.
 - b. Intermittent or continuous tree protection fences, in general, along "Limit of Work" lines indicated.
 2. Locate tree protection fences at outer limit of branch spread of protected trees
- B. Fence Construction:
 1. Materials:
 - a. Lumber:
 - 1) Sound, clean material, new or used, in good condition.
 - b. Fence Posts:
 - 1) 4 inches x 4 inches x 7 feet – 0 inch minimum length
 - c. Fence Rails:
 - d. 1 inch x 8 inches square edge stock x lengths to suit post spacings.
 2. Set posts 3 feet – 0 inches into ground, spaced at maximum of 10 feet – 0 inches on center, unless indicated otherwise.
 - a. Set one rail along top front face of posts
 - b. nail rails securely to each post
 3. Maintain fences as required, including replacing damaged or destroyed portions, throughout entire period of Work.
 4. Fences are to be removed upon completion of Work, or when directed by Architect
 5. Upon removal of fences, backfill post holes to grade and remove fence material from Project Site.

3.04 CLEARING AND GRUBBING

- A. Clearing:
 1. Cut trees and undergrowth within cleared areas as indicated.
 2. Confine equipment and operations to areas to be cleared
 3. Fell trees only into areas to be cleared
 4. Cut tree stumps and undergrowth roots flush with existing ground surface outside of construction areas and paved areas.
 - a. Where indicated, completely remove tree stumps as specified.
- B. Grubbing:
 1. Grub in cleared areas required to perform construction work
 2. Perform grubbing to completely remove stumps, roots, and organic materials

3.05 TREE AND STUMP REMOVAL

- A. Remove trees and stumps indicated or required to be removed.
 - 1. Remove trees, together with bulk of roots, to minimum depth of 4 feet below required grade, and within radius of approximately 7 feet beyond perimeter of trunk at grade.
- B. Fill and compact excavation from tree and stump removal.
 - 1. Fill in 6 inch layers, each compacted to 90 percent of maximum density in accordance with ASTM D 1557.
 - 2. Do not commence back filling until excavation is inspected and tested.

3.06 REMOVAL OF TOPSOIL

- A. When required, perform removal of topsoil in accordance with requirements as indicated on Drawings..

3.07 TRIMMING OF EXISTING TREES TO REMAIN

- A. Trim roots of trees where uncovered, making clean cuts.
 - 1. Cover cut roots with 4 inches of soil
- B. Prevent damage to tree limbs which project within work areas.
 - 1. Trim or cut only with specific prior approval of Architect or Landscape Architect.
 - 2. Remove dead branches and shape living branches as directed by Landscape Architect.
 - a. Make flush cuts leaving no stubs
 - b. Cut back to living tissue where necessary, smooth and shape surfaces to shed water.
- C. Apply tree wound paint on cut surfaces 1 inch diameter and larger when directed by Landscape Architect.

3.08 CLEANING

- A. Material Disposal:
 - 1. Remove cleared and grubbed materials, rubbish, debris, and other waste materials and legally dispose of them off Project Site.
- B. Chipping:
 - 1. Chipping of tree materials and disposal by distribution or dispersal on Project Site:
 - a. May be permitted, where and in manner as directed, subject to available space on-site.
 - 2. Chipping of tree materials is permitted, however, disposal by distribution or dispersal is not permitted on Project Site.
 - a. Remove chipping materials and legally dispose of them off Project Site.

END OF SECTION 31 1000

SECTION 32 0117

ASPHALT PAVING REPAIR

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Asphalt surfacing repair consisting of:
 - a. Areas removed for utility trenches.
 - b. Areas heaved by tree roots.
 - c. Cracked areas
 - d. Protruding areas where pavement meets hard surfaces.
 - e. Depressed areas and holes
 - f. Areas around new structures.
 - g. Raveled asphalt pavement.
 2. Cold milling/planing portions of existing asphalt pavement surface course.
 - a. Including hauling of removed material.
 3. Material and installation for following:
 - a. Asphalt (bituminous) surfacing.
 - b. Seal coat for asphalt (bituminous) surfacing.
- B. Related Sections:
1. Section 01 4500: Quality Control; soil testing requirements.
 2. Section 01 5000: Temporary Facilities and Controls; barriers and temporary controls.
 3. Section 01 5713: Temporary Erosion and Sedimentation Controls
 4. Section 31 0000: Earthwork
 5. Section 32 0116: Cold Milling Asphalt Pavement; removal of portion of existing asphalt pavement surface course.
 6. Section 32 1100: Base Course
 7. Section 32 1313: Concrete Paving

1.02 REFERENCES

- A. ASTM International (ASTM):
1. ASTM D 1188 – Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples.
- B. American Association of State Highway and Transportation Officials (AASHTO):
1. AASHTO Standard Specifications for Highway Materials and Methods of Sampling and Testing.
- C. Public Works Standards, Inc.:
1. Standard Specifications for Public Works Construction (SSPWC):
 - a. The "Greenbook"; current edition.
 - 1) Section 302 – Roadway Surfacing.
 2. Standard Plans for Public Works Construction (SPPWC); current edition.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

1.03 DEFINITIONS

- A. Cold Milling/Planing of Asphalt Pavement:
 - 1. Process of removing existing pavement from designated areas to lines and dimensions shown on Drawings or as directed by Architect.
- B. Reclaimed Asphalt Pavement (RAP):
 - 1. Material produced as result of cold milling.

1.04 SUBMITTALS

- A. Product Data:
 - 1. Bituminous Materials:
 - a. Manufacturer's technical data for materials and products
 - b. Site plan indicating extent of paving and accessories.
- B. Seal Coat:
 - 1. Manufacturer's product information and application procedures for seal coating.
- C. Weighmaster Certificates:
 - 1. Furnish licensed weighmaster certificates with each load of asphalt (bituminous) surfacing delivered to Project.
 - 2. Yield of Asphalt Material: 24 pounds per square foot of paving area based on 2 inch thickness after rolling.
 - 3. 5 percent tolerance will be allowed between total calculated weight and actual weight incorporated in Work.
 - 4. Deliver certificates to Owner's representative, who will collect certificates and ensure that material represented by each certificate is actually incorporated in Work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery of Sealer Material:
 - 1. Agitate bulk materials during transport.

1.06 PROJECT CONDITIONS

- A. Environmental Conditions:
 - 1. In event of rain or other inclement weather, suspend cold milling operations.
 - 2. Make necessary allowances for drainage of water that may pond in areas where milled sections have not been paved.
 - 3. Do not place asphalt (bituminous) surfacing when atmospheric temperature is below 40 degrees F, or during unsuitable weather.
- B. Grade Control:
 - 1. Establish and maintain required lines and elevations.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Cold milled/planed asphalt pavement to provide RAP of nominal one inch maximum size.

1. Tolerance of five percent in material retained on one inch sieve will be permitted, provided material passes 1-1/2 inch sieve.
- B. Ownership of RAP:
 1. Contractor will assume ownership of RAP material and responsibility to haul it from Project Site to his own storage site or otherwise legally dispose of it.
- C. Headers and Stakes:
 1. Headers: "Construction Heart" Grade redwood as graded by Redwood Inspection Service.
 - a. Size: 2 x 6, unless otherwise indicated.
 2. Stakes: 2 x 4 redwood or 2 x 3 Douglas fir, Construction Grade.
 3. Nails: Common, galvanized, 12d minimum.
- D. Asphalt Surface Course:
 1. Vehicle Traffic: Provide materials of class, grade, or type indicated, conforming to SSPWC, Section 203-6.4 – Asphalt Concrete Mixtures.
 - a. Class and Grade: C2-PG 64-10 per SSPWC Section 203-6.4.1
- E. Seal Coat:
 1. Provide seal coat materials conforming to SSPWC Section 203-9 by one of following or approved equal:
 - a. Guard-Top, Division of Western Emulsions Inc.
 - b. OverKote by Diversified Asphalt Products
 - c. Park Top by Western Colloid Products

2.02 COLD MILLING/PLANING EQUIPMENT

- A. Planing Machines:
 1. Where areas required to be cold milled are too small or inaccessible to larger machines, use skid steer type machine with planer attachment of type required to provide surface specified.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas of asphalt pavement indicated to be removed or repaired.
- B. Examine areas of asphalt pavement indicated to be cold milled.
 1. Verify presence of one or more of following materials that would impact performance of cold milling:
 - a. Pavement fabric.
 - b. Rubberized material.

3.02 PAVEMENT REMOVAL – GENERAL

- A. Remove asphalt pavement in accordance with applicable provisions of Section 31 2300 or Section 300 - Earthwork of SSPWC and following:
 1. Pavement Heaved by Roots:
 - a. Remove pavement to limits of distortion and expose roots.
 - a. Trim roots to provide at least 12 inches clearance to pavement.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

2. Remove protruding asphalt surfaces flush with surrounding grade using suitable tool or equipment so that adjacent finishes are not blackened.
3. Remove raveled and depressed asphalt pavement to limits indicated or required.
4. Saw cut existing improvements, trim holes and trenches in asphalt pavement to permit mechanical hand tampers to compact fill.

3.03 EXCAVATING, BACKFILLING, AND COMPACTING

- A. After pavement removal, fill depressions left by removal, regrade, and compact subgrade or base.
 1. Conform to requirements in Section 31 2300, as required.
- B. Where subgrade or base is deemed to be unstable or otherwise unsuitable, excavate such materials to firm earth, and replace with specified material.
- C. Install and compact fill materials in accordance with requirements of related Specification Sections.

3.04 RESURFACING

- A. Holes and Trenches:
 1. Remove loose dirt and backfill with cement-sand slurry allowing for surfacing one inch thicker than existing.
 2. Unless otherwise indicated on Drawings, resurface flush with existing adjoining pavement installing same type of materials and section provided in existing improvements.
- B. Other Areas:
 1. Cut other surface improvements damaged or removed to neat even line and excavated one inch below bottom of existing pavement.
 2. Resurface by following original grades and installing same type of materials provided in existing improvements.

3.05 COLD MILLING/PLANING OF EXISTING ASPHALT PAVEMENT

- A. General:
 1. Remove existing surface of asphalt pavement by milling/planing to depth, width, cross section and grade as specified or indicated on Drawings.
 2. Provide cold milled or planed surfaces as follows:
 - a. Uniformly grooved or ridged.
 - b. Outside lines neat and uniform.
 - c. True to grade and cross section with uniform cross-slope and positive drainage across traveled way
- B. Perform cold milling/planing in manner which prevents tearing and breaking of underlying and adjacent pavement and contamination of RAP with granular, subgrade or other deleterious materials.
 1. Remove existing asphalt pavement overlay from gutters adjacent to areas specified to be cold milled or planed, as directed by Architect.
 2. Load RAP directly to trucks from milling machine and haul to Contractor's stockpile or legally dispose of off Project Site.

3. Whenever cold milling/planing occurs adjacent to existing Portland cement concrete curbs, gutters or pavement, protect these improvements from damage.
 4. When necessary, "daylight" vertical cuts from cold milling/planing operations to outside edge of pavement to allow surface water to be drained off.
- C. At point of daily termination of cold milling/planing operations, limit changes in surface profile or cross-section to 2 inches with longitudinal transitions maximum of 1 inch vertically per foot.
- D. Cleaning of Cold Milled and planed Surfaces:
1. Immediately remove loose material resulting from milling and hauled to appropriate off-site location.
 2. Thoroughly broom clean milled/planed surface of remaining loose material.
 - a. Employ methods to minimize dust, complying with local air quality requirements.
 3. Leave milled/planed surface ready to receive new asphalt surfacing as specified.

3.06 HEADER INSTALLATION

- A. Install headers along edge of asphalt (bituminous) surfacing abutting turf, earth, or planting area, unless indicated otherwise.
- B. Install headers so bottom surface has continuous bearing on solid grade.
1. Where excavation for headers is undercut, thoroughly tamp soil under header.
 2. Compact backfill on both sides of header to density of adjacent undisturbed earth.
- C. Fasten headers in place with redwood or Douglas fir stakes of length necessary to extend into solid grade minimum of 12 inches.
1. Use stakes of sound material, neatly pointed, driven vertically, and securely nailed to headers.
 - a. Space stakes, not to exceed 4 feet on centers with top of stakes set one inch below top of header.
 - b. Provide minimum of 2-12d galvanized common nails through each stake.
- D. Remove existing headers where new surfacing is installed adjacent to existing surfacing.
- E. Install temporary headers at transverse joints of paving where continuous paving operations are not maintained.
- F. Provide additional stakes and anchorage as required to fasten headers in place.

3.07 BASE COURSE

- A. Refer to Section 32 1100 where new base course is required.

3.08 TOLERANCES

- A. Smoothness:
 - 1. Provide surface of asphalt (bituminous) surfacing after rolling that is even, smooth, and uniform in texture with no voids or rock pockets
 - a. Free of roller marks, or other irregularities
 - b. Not varying by more than 0.03 foot, except at local depressions or raised areas as indicated, when 10 foot straightedge is placed on surface.
- B. Grade:
 - 1. Do not allow finished grade to vary more than 0.02 foot above or below required grade.
 - 2. Provide compensating variations within prescribed tolerance so that average grade and cross-section are provided.

3.09 REPAIRING AND RESEALING EXISTING SURFACES

- A. Preparation of Surfaces:
 - 1. Prior to filling cracks, clean existing asphalt paving of loose and foreign materials and coat with film of asphalt emulsion.
- B. Repair of Existing Surfacing:
 - 1. Fill cracks 1/2 inch wide and less with RS-1 emulsion and silica sand or other required material.
 - 2. Fill cracks larger than 1/2 inch wide with Type C2 Asphalt Concrete as specified.
 - a. Fill cracks o level of adjacent surfacing.
 - 3. Where low areas, holes, or depressions occur in existing surfacing, repair with emulsified asphalt.
 - a. Install material; strike off emulsified asphalt with straightedge flush with adjoining surfacing.
 - b. Finish with steel trowel, and after dehydration, compact by rolling or tamping.

3.10 TESTING

- A. Flood test completed asphalt (bituminous) surfacing in presence of Project Inspector after final lift of asphalt and prior to application of seal coat.
 - 1. Repair areas of standing water or puddles and flood test locally.
 - 2. Repair areas of ponding and retest as necessary.

3.11 SEAL COAT

- A. General:
 - 1. After asphalt (bituminous) surfacing has passed flood test, clear and allow to dry and cure for 30 days.
 - 2. Apply two coats of surface seal as specified.
 - 3. Where indicated, provide multiple coats of surface seal to existing asphalt (bituminous) surfacing.
 - 4. Where new asphalt (bituminous) surfacing joins existing asphalt (bituminous) surfacing, overlap surface seal minimum of 12 inches onto existing asphalt (bituminous) surfacing.

- B. Surface Preparation:
 - 1. Thoroughly wash surfaces with water to remove dirt, debris, excessive oil and grease, or other foreign matter and allow to dry.
- C. Application:
 - 1. Install seal coat in strict accordance with manufacturer's written directions and recommendations.
 - 2. Install 2 coats of seal coat to new asphalt (bituminous) surfacing.
 - a. Apply first coat after flood testing.
 - b. Clean surface and allow to dry before installing second coat.
 - c. When first coat has dried, apply second coat and allow to dry before permitting traffic on surface.
 - 3. Where new asphalt (bituminous) surfacing is installed adjacent to existing asphalt (bituminous) surfacing, overlap surface seal minimum of 12 inches onto existing asphalt (bituminous) surfacing.
 - 4. Where existing asphalt (bituminous) surfacing is indicated to be patched and sealed.
 - a. Apply 2 coats of surface seal after patching.

3.12 FIELD QUALITY CONTROL

- A. When straightedge specified in SSPWC Section 302-5.6.2 is laid on finished surface parallel to centerline of area, surface is not to vary from edge of straightedge more than 3/8 inch at any point, or at changes of grade.
 - 1. Bring areas that are not within tolerance to grade within one working day following initial cold milling/planing.
- B. Testing:
 - 1. Owner reserves right to obtain samples and perform tests to ensure compliance with Specifications, and to review weight slips and invoices of materials delivered to Project Site.

3.13 CLEANING

- A. Comply with requirements of Section 01 7423 and following:
 - 1. Immediately remove loose material resulting from asphalt removal and haul to appropriate off-site location.
 - 2. Thoroughly broom clean milled surface of remaining loose material.
 - a. Employ methods to minimize dust, complying with local air quality requirements.
 - 3. Leave milled surface ready to receive new asphalt surfacing as specified.
- B. Remove and legally dispose of rubbish, debris, and waste materials off Project Site.
 - 1. Comply with requirements of Section 01 7419.

3.14 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for 7 days or until surface temperature is less than 140 degrees F.
 - 1. Protect Work until Substantial Completion.

END OF SECTION 32 0117

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 32 1100

BASE COURSE

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Furnishing and installing base course material under paving.
- B. Related Sections:
 - 1. Section 31 0000: Earthwork; other base materials
 - 2. Section 32 0117: Asphalt Paving Repair
 - 3. Section 32 1313: Concrete Paving

1.02 REFERENCES

- A. State of California Department of Transportation (Caltrans):
 - 1. Standard Specifications:
 - a. Division IV – Subbases and Bases
 - 1) Section 26 – Aggregate Bases.
- B. Public Works Standards, Inc.:
 - 1. Standard Specifications for Public Works Construction (SSPWC):
 - a. The "Greenbook"; current edition.
 - 2. Standard Plans for Public Works Construction (SPPWC); current edition.

1.03 DEFINITIONS

- A. Caltrans Class 2 Base:
 - 1. Comply with Section 26-1.02B of Caltrans Standard Specifications, current edition
 - a. Aggregate Gradation:
 - 1) Conforming within percentage passing limits for sieve sizes shown in Aggregate Gradation Table.
 - b. Aggregate Quality Characteristics:
 - 1) Complying with requirements shown in Aggregate Quality Characteristics Table
- B. Crushed Aggregate Base:
 - 1. Consisting entirely of crushed rock and rock dust.
 - a. Conforming to requirements of SSPWC Sections 200-1.1 and 200-1.2

1.04 SUBMITTALS

- A. Product Data:
 - 1. Include material source, technical information, and test data for base materials.
 - 2. Gradation and quality certifications: Dated within 30 days of submittal.

1.05 QUALITY ASSURANCE

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- A. Comply with Caltrans Standard Specifications or SSPWC as minimum requirement, except where indicated otherwise.

PART 2 PRODUCTS

2.01 BASE COURSE MATERIALS

- A. Caltrans Class 2 Base: :
 - 1. Conforming to Caltrans Class 2 as defined in Article 1.05 B.
- B. Crushed Aggregate Base:
 - 1. Conforming to requirements of SSPWC as defined in Article 1.05 A.

2.02 MATERIAL APPROVAL

- A. Provide Base material as inspected by Project Inspector prior to installation.
 - 1. Owner may choose to have additional tests performed by geotechnical engineer, retained by Owner before installation.

PART 3 EXECUTION

3.01 BASE COURSE INSTALLATION

- A. Install base course material in layers not exceeding 3 inches in thickness, unless otherwise required.
 - 1. Grade and compact to indicated levels or grades
 - a. Cut and fill.
 - b. Water and roll until surface is hard and true to line, grade and required section.
 - c. Provide relative compaction of at least 95 percent, unless otherwise required.
 - 2. Grade base course to elevations indicated on Drawings, ready to receive specified surfacing.

3.02 CLEANING

- A. Remove and legally dispose of rubbish, debris, and waste materials off Project Site.

3.03 PROTECTION

- A. Protect Work until Substantial Completion.

END OF SECTION 32 1100

SECTION 32 1313

CONCRETE PAVING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Exterior concrete paving for:
 - a. Walkways (sidewalks)
 - b. Curbs and gutters
 - c. Driveways
 - 2. Work Includes:
 - a. Formwork
 - b. Reinforcing
 - c. Portland cement

- B. Related Sections
 - 1. Section 01 4500: Quality Control; testing and inspection of concrete.
 - 2. Section 01 5000: Temporary Facilities and Controls; barriers and temporary controls.
 - 3. Section 07 9200: Joint Sealants; traffic sealants.
 - 4. Section 31 0000: Earthwork; excavation, backfilling, and grading requirements.
 - 5. Section 32 1100: Base Course
 - 6. Section 32 0117: Asphalt Paving Repair
 - 7. Section 32 1723: Pavement Markings

1.02 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM A 615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
 - 2. ASTM A767 – Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement
 - 3. ASTM A 1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
 - 4. ASTM C31 – Standard Practice for Making and Curing Concrete Test Specimens in the Field
 - 5. ASTM C 33 – Standard Specification for Concrete Aggregates
 - 6. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 7. ASTM C 94 – Standard Specification for Ready-Mixed Concrete
 - 8. ASTM C143 – Standard Test Method for Slump of Hydraulic-Cement Concrete
 - 9. ASTM C150 – Standard Specification for Portland Cement
 - 10. ASTM C171 – Standard Specification for Sheet Materials for Curing Concrete
 - 11. ASTM C172 – Standard Practice for Sampling Freshly Mixed Concrete
 - 12. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
 - 13. ASTM C 260 – Standard Specification for Air-Entraining Admixtures for Concrete

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

14. ASTM C 494 – Standard Specification for Chemical Admixtures for Concrete
 15. ASTM C979 – Standard Specification for Pigments for Integrally Colored Concrete
 16. ASTM C 1059 – Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete
 17. ASTM C1064 – Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
 18. ASTM D 1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
 19. ASTM D 1752 – Standard Specification for Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
- B. American Concrete Institute (ACI):
1. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
 2. ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.
 3. ACI 305R – Specification for Hot Weather Concreting
 4. ACI 306R – Guide to Cold Weather Concreting
 5. ACI 308R – Guide to External Curing of Concrete.
 6. ACI 309R – Guide for Consolidation of Concrete.
- C. Concrete Reinforcing Steel Institute (CRSI):
1. CRSI Manual of Standard Practice.
 2. CRSI Placing Reinforcing Bars
- D. Public Works Standards, Inc.:
1. Standard Specifications for Public Works Construction (SSPWC):
 - a. The "Greenbook"; current edition.
 2. Standard Plans for Public Works Construction (SPPWC); current edition.
- E. West Coast Lumber Inspection Bureau (WCLIB):
1. Standard Grading Rules No. 17, 2004.
- F. South Coast Air Quality Management District (SCAQMD):
1. Rule 1113 – Architectural Coatings

1.03 SUBMITTALS

- A. Product Data:
1. For each type of manufactured material and product indicated.
- B. Design Mixes:
1. For each concrete pavement mix.
 2. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

1.04 QUALITY ASSURANCE

- A. Concrete Standards:
1. Comply with provisions of referenced standards, except where more stringent requirements are indicated.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- B. Concrete Manufacturer Qualifications:
 - 1. Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

- C. Installer Qualifications:
 - 1. Experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

- D. Concrete Testing Service:
 - 1. Engage qualified independent testing agency to design concrete mixes.

- E. Field-Constructed Mockup:
 - 1. Cast 6 foot square mockup of each concrete type scheduled to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.
 - a. Construct mock-up slab panels for following finishes as applicable:
 - 1) Light Textured Broom Finish
 - 2) Medium Textured Broom Finish
 - 3) Heavy (Coarse) Textured Broom Finish
 - 2. Provide Control Joint (CJ) and Expansion Joint (EJ) in each mockup.
 - 3. Construct mockups in location and of size indicated or, when not indicated, as directed by Architect.
 - 4. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - 5. Obtain Architect's acceptance of mockups before starting construction.
 - 6. Should Architect determine that mockup does not meet requirements, demolish and remove it from Project Site, and cast another until mockup is accepted.
 - 7. Maintain accepted mockup undisturbed during construction as standard for judging completed pavement.
 - 8. Demolish accepted mockup and remove from Project Site when directed by Architect.
 - a. Accepted mockups may become part of completed Work where undisturbed at time of Substantial Completion.

- F. Preinstallation Conference:
 - 1. Conduct conference at Project Site complying with requirements in Section 01 3119
 - 2. Before submitting design mixes, review concrete pavement mix design and examine procedures for ensuring quality of concrete materials.
 - a. Require representatives of each entity directly concerned with concrete pavement to attend, including following:
 - 1) Contractor's superintendent.
 - 2) Independent testing agency responsible for concrete design mixes.
 - 3) Ready-mix concrete producer.
 - 4) Concrete subcontractor.

1.05 PROJECT CONDITIONS

- A. Traffic Control:
 - 1. Maintain access for vehicular and pedestrian traffic as required for other construction activities.
 - 2. Comply with other requirements specified in Section 01 5000.

1.06 REGULATORY REQUIREMENTS

- A. General:
 - 1. Construct walkways (sidewalks) to be stable, firm, and slip resistant in accordance with CBC Section 11B-302 and 11B-403 and as specified in this Section.
 - 2. Refer to Article 3.06 for slip resistant finishes.

PART 2 PRODUCTS

2.01 GENERAL

- A. Batch concrete in certified plant capable of achieving Waiver of Continuous Batch Plant and Materials Tests.
- B. Produce each type and color of concrete in same batch plant.
- C. Refer to Section 32 1100 for base course materials.

2.02 FORMWORK

- A. Forms:
 - 1. Metal, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal and to provide full depth, continuous straight, smooth exposed surfaces.
 - 2. Use flexible or curved forms to form radius bends as required.
 - a. Do not use notched and bent forms.
- B. Form Release Agent:
 - 1. Provide commercial formulation form-release agent complying with local Volatile Organic Compound (VOC) limitations that will not bond with stain. or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.03 REINFORCING MATERIALS

- A. Reinforcing Bars:
 - 1. Conforming to ASTM A 615, Grade 60, deformed.
- B. Joint Dowel Bars:
 - 1. Plain Steel Bars:
 - a. Conforming to ASTM A 615, Grade 60.
 - 2. Zinc coated (galvanized) after fabrication according to ASTM A 767, Class I coating
 - 3. Cut bars to length with ends square and free of burrs.
 - 4. Provide polyethylene closed-end sleeve or approved alternate at expansion joint dowels
- C. Bar Supports:
 - 1. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and dowels in place.

2. Manufacture bar supports, according to CRSI Manual, from steel wire, plastic, or precast concrete or fiber reinforced concrete of greater compressive strength than concrete, and as follows:
 - a. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.04 CONCRETE MATERIALS

- A. Use same brand and type of cementitious material from same manufacturer throughout Project.
- B. Portland Cement:
 1. Conforming to ASTM C 150, Type II or Type V
 2. Color: **CP-1** – Natural Gray, for non-colored locations
- C. Aggregate:
 1. Normal-Weight:
 - a. Conforming to ASTM C 33, uniformly graded, from single source, with coarse aggregate as follows:
 - 1) Class: 1N.
 2. Maximum Aggregate Size: 1 inch nominal.
 3. Do not use fine or coarse aggregates containing substances that cause spalling.
- D. Water:
 1. Conforming to ASTM C 94.

2.05 ADMIXTURES

- A. Certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures.
- B. Air-Entraining Admixture:
 1. Conforming to ASTM C 260.
- C. Water-Reducing Admixture:
 1. Conforming to ASTM C 494, Type A.

2.06 CURING MATERIALS

- A. Moisture-Retaining Cover:
 1. Conforming to ASTM C 171
 - a. Non-staining, reinforced, waterproof sheet.
- B. Water: Potable.
- C. Integrally Colored Concrete:
 1. Curing compound recommended by manufacturer of color admixture.

2.07 RELATED MATERIALS

- A. Control Joint Material:

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

1. Expansion Joint Filler Material:
 - a. Fiber Type Expansion Joint Filler:
 - 1) Resilient, flexible, non-extruding, composed of cellular fibers securely bonded together and uniformly saturated with asphalt to
 - 2) Conforming to ASTM D 1751.
 - 3) Fibre Expansion Joint by W.R. Meadows, or approved equal.
 2. Plain or punched for dowels as required.
- B. Bonding Agent:
1. Conforming to ASTM C 1059, Type II
 - a. Acrylic emulsion or styrene butadiene.

2.08 CONCRETE MIX DESIGN

- A. Prepare design mixes for each type and strength of normal-weight concrete by either laboratory trial batch or field experience methods as specified in ACI 301.
1. For trial batch method, use qualified independent testing agency for preparing and reporting proposed mix designs.
 - a. Do not use Owner's field quality-control testing agency as independent testing agency.
 2. Limit use of fly ash to 15 percent of cement content by weight.
- B. Proportion mixes according to ACI 211.1 and ACI 301 to provide normal-weight concrete with following properties:
1. Compressive Strength:
 - a. 3,000 psi at 28 days when tested in accordance with ASTM C39:
 - b. Slump Range: 3 inches to 4 inches.
 - c. Water-Cement Ratio: Maximum 50 percent by weight.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content of 2.5 percent to 4.5 percent.

2.09 CONCRETE MIXING

- A. Ready-Mixed Concrete:
1. Comply with specified requirements and ASTM C 94 and following:
 - a. When air temperature is between 85 degrees F and 90 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes
 - b. When air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

- A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction.
1. Do not begin paving work until such conditions have been corrected and subbase is ready to receive paving.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.

3.02 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for paving to required lines, grades, and elevations.
 - 1. Install forms to allow continuous progress of Work and so forms can remain in place at least 24 hours after concrete placement.
- B. Check completed formwork and screeds for grade and alignment to following tolerances:
 - 1. Top of Forms:
 - a. Not more than 1/8 inch in 10 feet.
 - 2. Vertical Face on Longitudinal Axis:
 - a. Not more than 1/4 inch in 10 feet.
- C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

3.03 PLACING REINFORCEMENT

- A. Follow CRSI recommended practice for placing and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. When specified or indicated, install welded wire fabric in lengths as long as practicable:
 - 1. Lap adjoining pieces at least one full mesh and lace splices with wire.
 - 2. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.04 JOINTS

- A. Construct control, construction, and expansion joints and tool edgings true to line with faces perpendicular to surface plane of concrete.
 - 1. Construct transverse joints at right angles to centerline, unless indicated otherwise.
 - 2. When joining existing paving, place transverse joints to align with previously placed joints, unless indicated otherwise.
- B. Tooled Control Joints (CJ):
 - 1. Form tooled control joints after initial floating by grooving and finishing each edge of joint with groover tool to radius as indicated or specified.
 - a. Repeat grooving of control joints after applying surface finishes.
 - b. Eliminate tool marks on concrete surfaces.
 - 2. Jointer Tool:
 - a. 1/4 inch wide at surface, tapered, with top edges rounded to 1/4 inch radius.
 - 3. Location:
 - a. As shown on Drawings, but not more than 15 feet on center both ways.
 - b. Typical Sidewalk Joints:
 - 1) Make joints 5 feet on center, or as directed by Architect.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- C. Sawn Joints:
1. Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades.
 2. Cut 1/8 inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
 3. Prior approval of Architect is required for sawed joints.
- D. Edging:
1. Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with edging tool to specified radius.
 2. Repeat tooling of edges after applying surface finishes.
 - a. Eliminate tool marks on concrete surfaces.
 3. Radius:
 - a. 1/4 inch, unless indicated otherwise.
- E. Construction Joints (CJ):
1. Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than 1/2 hour, unless paving terminates at isolation joints.
 2. Continue reinforcement across construction joints unless indicated otherwise.
 3. Do not continue reinforcement through sides of strip paving unless indicated.
 4. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- F. Expansion Joints (EJ):
1. Provide in exterior concrete paving on grade at maximum interval of 30 feet on center or as noted.
 2. Form expansion joints of preformed joint filler strips as follows:
 - a. At intersections with vertical surfaces.
 - b. At surfaces abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated
 - c. At other penetrations through paving.
 3. Joint Fillers:
 - a. Use fiber type expansion joint fillers typically and depress 1/4 inch unless otherwise noted.
 - b. Use cork type expansion joint fillers at conditions with non-bituminous waterproofing, liquid waterproofing, or sealant systems.
 - c. Where more than one length is required, lace or clip joint filler sections together.
 - d. Do not leave gaps between ends of joint filler units.
 - e. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap.
 - 1) Remove protective cap after concrete has been placed on both sides of joint.
 4. Install dowel bars and support assemblies at joints where indicated.
 - a. Lubricate or asphalt-coat one half of dowel length to prevent concrete bonding to one side of joint.
- G. Installation of Sealants:
1. Comply with requirements of Section 07 9200 and following:
 - a. Install sealant to depths recommended by sealant manufacturer but within following general limitations, measured at center section of bead:

- 1) For sidewalks, pavements, and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to depth equal to 75 percent of joint width, but not more than 1/2 inch deep or less than 3/8 inch deep.
- b. Tool joints to form smooth, uniform beads with slightly concave surfaces, with finished joints straight, uniform, smooth and neatly finished.
- c. Remove excess sealant from adjacent surfaces of joint, leaving Work in neat, clean condition.
- d. Do not use tooling agents unless recommended by sealant manufacturer.

3.05 CONCRETE PLACEMENT

- A. Inspection:
 1. Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in.
 2. Notify other trades to permit installation of their work.
- B. Moisten subbase to provide uniform dampened condition at time concrete is placed.
 1. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- C. Comply with requirements and ACI 304R for measuring, mixing, transporting, and placing concrete.
- D. Deposit and spread concrete in continuous operation between transverse joints.
 1. Do not push or drag concrete into place or use vibrators to move concrete into place.
 2. When concrete placing is interrupted for more than 1/2 hour, place construction joint.
- E. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping.
 1. Use equipment and procedures to consolidate concrete complying with ACI 309R.
 2. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator.
 3. Keep vibrator away from joint assemblies, reinforcement, or side forms.
 4. Use only square-faced shovels for hand-spreading and consolidation.
 5. Consolidate with care to prevent dislocating reinforcing, dowels, and joint devices.
- F. Screed paved surfaces with straightedge and strike off.
 1. Use bull floats or darbies to form smooth surface plane before excess moisture or bleed water appears on surface.
 2. Do not further disturb concrete surfaces prior to beginning finishing operations.
- G. Hot-Weather Placement:
 1. Place concrete according to recommendations in ACI 305R and as follows when hot-weather conditions exist:
 - a. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- 1) Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water.
- 2) Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, reinforcement steel, and subgrade just before placing concrete.
4. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.06 CONCRETE FINISHING

- A. Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.
- B. Float Finish:
 1. Begin floating when bleed water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations.
 2. Float surface with power-driven floats, or by hand floating, where area is small or inaccessible to power units.
 3. Finish surfaces to true planes within tolerance of 1/4 inch in 10 feet as determined by 10 foot long straightedge placed anywhere on surface in any direction.
 4. Cut down high spots and fill low spots.
 5. Refloat surface immediately to uniform granular texture.
- C. Broom Finish:
 1. Medium Textured Broom Finish:
 - a. For slopes less than 6 percent, provide medium texture by drawing soft bristle broom across concrete surface perpendicular to line of traffic to provide uniform fine line texture finish.
 2. Heavy (Coarse) Textured Broom Finish:
 - a. For slopes 6 percent and greater, provide coarse finish by striating surface 1/16 inch to 1/8 inch deep with stiff-bristled broom, perpendicular to line of traffic.

3.07 CURING AND PROTECTION

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
 1. Comply with ACI 306.1 for cold-weather protection and follow recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder:
 1. Apply evaporation retarder to concrete surfaces when hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations.
 2. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Curing Methods:
 - 1. Cure concrete by moisture curing, moisture-retaining-cover curing, curing compounds, or combination of following:
 - a. Moisture Curing:
 - 1) Keep surfaces continuously moist for not less than seven days with following materials:
 - a) Water.
 - b) Continuous water-fog spray.
 - c) Absorptive cover, water saturated, and kept continuously wet.
 - 2) Cover concrete surfaces and edges with 12 inch lap over adjacent absorptive covers.
 - b. Moisture-Retaining-Cover Curing:
 - 1) Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive.
 - 2) Immediately repair any holes or tears during curing period using cover material and waterproof tape. .

3.08 FIELD QUALITY CONTROL

- A. Testing Services:
 - 1. Perform testing according to following requirements:
 - a. Sampling Fresh Concrete:
 - 1) Obtain representative samples of fresh concrete according to ASTM C 172, except as modified for slump to comply with ASTM C 94.
 - b. Slump Tests:
 - 1) Conforming to ASTM C 143:
 - a) One test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete.
 - 2) Additional tests will be required when concrete consistency changes.
 - c. Compression Test Specimens:
 - 1) Conforming to ASTM C 31:
 - a) One set of four standard cylinders for each compressive-strength test, unless directed otherwise.
 - 2) Mold and store cylinders for laboratory cured test specimens except when field-cured test specimens are required.
 - d. Air Content:
 - 1) Conforming to ASTM C 231 – Pressure Method:
 - a) One test for each compressive-strength test, but not less than one test for each day's pour of each type of air-entrained concrete.
 - e. Concrete Temperature:
 - 1) Conforming to ASTM C 1064:
 - a) One test hourly when air temperature is 40 degrees F, and below and when 80 degrees F and above.
 - b) One test for each set of compressive strength specimens.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- f. Compressive-Strength Tests:
 - 1) Conforming to ASTM C 39:
 - a) One set for each day's pour of each concrete class exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd.
 - 2) Test one specimen at 7 days and two specimens at 28 days
 - 3) Retain one specimen in reserve for later testing when required.
 - g. When frequency of testing will provide fewer than five compressive-strength tests for given class of concrete, conduct testing from at least five randomly selected batches or from each batch when fewer than five are used.
 - h. When total quantity of given class of concrete is less than 50 cu. yd., Architect may waive compressive-strength testing when adequate evidence of satisfactory strength is provided.
 - i. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide for corrective procedures for:
 - 1) Protecting and curing in-place concrete.
 - j. Strength level of concrete will be considered satisfactory when averages of sets of three consecutive compressive-strength test results equal or exceed specified compressive strength and no individual compressive-strength test result falls below specified compressive strength by more than 500 psi.
2. Report test results in writing to Architect, concrete manufacturer, and Contractor within 24 hours of testing.
 - a. Submit Reports of compressive-strength tests containing following:
 - 1) Project identification name and number
 - 2) Date of concrete placement
 - 3) Name of concrete testing agency
 - 4) Concrete type and class
 - 5) Location of concrete batch in pavement
 - 6) Design compressive strength at 28 days
 - 7) Concrete mix proportions and materials
 - 8) Compressive breaking strength
 - 9) Type of break for both 7 and 28 day tests.
3. Nondestructive Testing:
 - a. Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection.
4. Additional Tests by Testing Agency:
 - a. Make additional tests of concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Architect.
 - b. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

3.09 REPAIRS

- A. Remove and replace concrete paving that is broken, damaged, or defective, or does not meet requirements of this Section.

- B. Drill test cores where directed by Architect when necessary to determine magnitude of cracks or defective areas.
 - 1. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to paving with epoxy adhesive.

3.10 CLEANING

- A. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.

3.11 PROTECTION

- A. Protect concrete from damage.
 - 1. Exclude traffic from paving for at least 14 days after placement.
 - 2. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
 - 1) Protect the Work of this section until date of Substantial Completion.

END OF SECTION 32 1313

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 32 1723

PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Parking lot striping:
 - a. Includes markings and accessibility symbols, for accessible spaces as indicated.
 - b. Fire lane identification
 - c. Other curb identification and markings.

- B. Related Sections:
 - 1. Section 32 0117: Asphalt Paving Repair
 - 2. Section 32 1313: Concrete Paving
 - 3. Section 32 1726: Detectable Warning Surfaces

1.02 REFERENCES

- A. California Code of Regulations, Title 24, 2016 edition, Part 2, California Building Code (CBC), Volumes 1 and 2.
 - 1. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.

- B. Federal Specifications (FS):
 - 1. FS TT-P-1952 – Paint, Traffic and Airfield Marking, Waterborne, current version.

- C. Federal Standards (FED-STD):
 - 1. FED-STD 595C – Colors Used in Government Procurement, current version.

- D. South Coast Air Quality Management District (SCAQMD):
 - 1. Rule 1113 – Architectural Coatings

1.03 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's product data on traffic paint products and material.

- B. Shop Drawings:
 - 1. Indicating location, extent, color, and texture of markings.

- C. Samples:
 - 1. Color samples of paint products.

1.04 PROJECT CONDITIONS

- A. In-Service Surface Temperature Limits:
 - 1. Dry: 50 degrees F minimum.
 - 2. Do not apply when air, surface, or product temperatures are below 50 degrees F, or when adverse weather conditions are forecast.
- B. Dry Time at 77 degrees F and 50 percent Relative Humidity:
 - 1. Drying times will vary depending on temperature, air circulation, and humidity.

1.05 REGULATORY REQUIREMENTS

- A. Accessible Parking Spaces Serving Particular Building or Facility:
 - 1. When serving more than one accessible entrance, locate on shortest accessible route to entrance or multiple accessible entrances complying with CBC Section 11B-208.3.1
 - 2. Provide minimum number of required accessible parking spaces in accordance with CBC Section 11B-208.2
 - 3. Provide at least one van-accessible parking space for every six, or fraction thereof, of accessible parking spaces in accordance with CBC 11B-208.2.4
 - 4. Provide accessible parking spaces and access aisles comply with CBC Section 11B-502
 - a. Dimension parking spaces to centerline of marked lines as follows:
 - 1) Mark parking spaces and access aisles according to CBC Figures 11B-502.2, 11B-502.3 and 11B-502.3.3
 - 2) Provide surfaces complying with CBC Section 11B-11B-302 and at same level with slopes not steeper than 1:48 in any direction complying with CBC Section 11B-502.4
 - 5. Parking Space Dimensions:
 - a. Parking Spaces and Van Accessible Spaces: As indicated on Drawings.
 - b. Place access aisles on either side of parking spaces.
 - 1) Locate on passenger side for van accessible parking spaces.
 - 6. Parking Space and Access Aisle Markings:
 - a. Mark access aisles with blue painted borderline around their perimeter.
 - b. Mark area within blue borderlines with hatched lines maximum of 36 inches on center with color contrasting to that of aisle surface.
 - 1) White on asphalt paving.
 - 2) Blue on concrete paving.
 - c. Access aisle markings may extend beyond minimum required length complying with CBC Section 11B-502.3.3.
 - d. Mark access aisles so as not to overlap vehicular way complying with CBC Section 11B-502.3.4.
 - e. Provide vertical clearance of 8 feet-2 inches minimum for accessible parking spaces, access aisles, and vehicular routes serving them complying with CBC Section 11B-502.5.
- B. Fire Lane Identification:
 - 1. Provide identification conforming to requirements of local fire authority.
 - 2. Fire Lane Entrance and No Parking Signs:
 - a. Post each vehicle entrance to area containing red curbs with approved Fire Lane Entrance Sign.

3. Fire Lane Signs: Post “Fire Lane – No Parking” signs immediately adjacent to each designated fire lane and at intervals not to exceed 50 feet, unless directed otherwise by local fire authority.
4. Fire Lane Curb Markings: Paint curbs safety red.
 - a. On top of curb, paint “**FIRE LANE – NO PARKING**” in white letters 3 inches high, at spacing of 30 feet on center, or portion thereof.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Traffic Marking Paint:
 1. 100 percent Acrylic Resin System:
 - a. Ready-mixed, one–component, waterborne acrylic traffic line paint.
 - b. High Solids formulated for hot and cold application to either asphalt concrete or Portland cement concrete pavements.
 2. Meets performance standards of FS TT-P-1952, Type II.
 3. VOC Content: Less than 100g/L
 4. Colors:
 - a. Specified colors conforming to FED-STD 595C.
 5. Product and Manufacturer:
 - a. Fast Dry Paint Series by American Traffic Products, Rialto, CA, or approved equal.

PART 3 EXECUTION

3.01 PAVEMENT MARKINGS

- A. Application of Paint:
 1. Prior to application of paint, allow pavement to properly cure.
 - a. Clean and prepare in accordance with paint manufacturer's written recommendations.
 2. Provide mechanical equipment to install paint in a uniform, straight or curved pattern, without holidays and other defects.
 3. Do not permit traffic until paint has completely cured.
 4. Install 2 coats in thickness recommended by manufacturer.

- B. Marking Width and Color:

1. Unless indicated otherwise, marking width and color are as follows:

	<u>Width</u>	<u>Color</u>
a. Parking stall lines	4 inches	
1) General		White
2) Accessible		Blue
b. Traffic markings	4 inches	Yellow
c. Striping	4 inches	
1) General		Yellow
2) Accessible		Blue
d. International Symbol of Accessibility (ISA)	2 inches	White on blue background
e. Fire Lanes:		
1) Curbs		Red
2) Lettering		White

3.02 CLEANING

- A. Remove and legally dispose of rubbish, debris, and waste materials off Project Site.

3.03 PROTECTION

- A. Protect Work:
 - 1. With barricades and signs until paint has completely dried.
 - 2. Until Substantial Completion

END OF SECTION 32 1723

SECTION 32 1726

DETECTABLE WARNING SURFACES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Cast In Place Detectable Warning Surface Tiles where indicated.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 32 1313: Concrete Paving
 - 3. Section 32 1723: Pavement Markings

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition.
 - 1. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.
- B. ASTM International (ASTM):
 - 1. ASTM B117 – Standard Practice for Operating Salt Spray (Fog) Apparatus
 - 2. ASTM C 293 – Standard Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading)
 - 3. ASTM C1026 – Standard Test Method for Measuring the Resistance of Ceramic and Glass Tile to Freeze-Thaw Cycling
 - 4. ASTM D 543 – Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents
 - 5. ASTM D 570 – Standard Test Method for Water Absorption of Plastics
 - 6. ASTM D 638 – Standard Test Method for Tensile Properties of Plastics
 - 7. ASTM D 695 – Standard Test Method for Compressive Properties of Rigid Plastics
 - 8. ASTM D 790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
 - 9. ASTM D 1037 – Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials
 - 10. ASTM D 1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
 - 11. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials
 - 12. ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
- C. Federal Standard (FS):
 - 1. Federal Standard 595C – Colors Used in Government Procurement, current version.

1.03 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's literature describing products, installation procedures and routine maintenance.

- B. Shop Drawings:
 - 1. Show fabrication details for specified products, consisting of:
 - a. Composite structural system
 - b. Tile surface profile
 - c. Sound on cane contact amplification feature.
 - 2. Include plans of tile placement including joints, and material to be used.
 - a. Outline installation materials and procedure
 - 3. Design and show tile pattern between existing expansion joints with tile rib dimension used for cut size of panels.

- C. Samples:
 - 1. Minimum of four samples, as Project Site mock-ups, of full cast in place detectable tile warning surface tiles of kind proposed for use.
 - 2. Minimum of four samples, as Project Site mock-ups, of full surface-mounted detectable warning surface tiles of kind proposed for use.

- D. Material Test Reports:
 - 1. From qualified accredited independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet properties indicated.
 - 2. Conduct test reports on cast in place detectable warning surface tiles as certified by qualified independent testing laboratory.
 - 3. Do not include manufacturer's MSDS sheets with this submittal.
 - a. Furnish to Contractor only.

- E. Maintenance Instructions:
 - 1. Copies of manufacturer's specified maintenance practices for cast-in-place detectable warning surface tiles

1.04 QUALITY ASSURANCE

- A. Provide cast in place detectable warning surface tiles and accessories as produced by single manufacturer with minimum of three years experience in manufacturing of cast in place detectable warning surface tiles.

- B. Installer's Qualifications:
 - 1. Engage experienced installer certified in writing by detectable warning surface tile manufacturer as qualified for installation, who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.
 - 2. Arrange for manufacturer's supervisor to be present at initial pour for cast-in-place tiles.
 - 3. Arrange for manufacturer's supervisor to be present at initial installation of surface-mounted tiles.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Suitably package or crate tiles to prevent damage in shipment or handling.
 - 1. Protect finished surfaces with sturdy wrappings, and identify tile type by part number.
- B. Deliver tiles to designated location at Project Site for storage prior to installation.

1.06 PROJECT CONDITIONS

- A. Environmental Conditions and Protection:
 - 1. Maintain minimum temperature of 40 degrees F in spaces to receive tiles for at least 24 hours prior to installations, during installation, and for not less than 24 hours after installation.
 - 2. Store tile material in spaces where they will be installed for at least 24 hours before beginning installation.
 - 3. After installation, maintain minimum temperature of 40 degrees F in areas where Work is completed.
- B. Contain and control use of water for Work, cleaning, or dust control.
 - 1. Do not allow waste water to come into contact with public.
 - 2. Provide barricades or screens to protect public.
- C. Conduct disposal of liquids or other materials of possible contamination in accordance with federal state and local laws and ordinances.
- D. Use cleaning materials with code-compliant low VOC solvent content and low flammability when used on Project Site.
- E. Coordinate phasing and flagging personnel operations as specified in Division 01.

1.07 REGULATORY REQUIREMENTS

- A. Detectable Warning Surfaces:
 - 1. Provide tactile warning surfaces complying with CBC Section 11B-705.1
 - 2. Surfacing Color: No. 33538 "Federal Yellow" conforming to FS 595C.
 - a. Exception:
 - 1) Provide colors used for locations at curb ramps, islands, or cut-through medians that contrast visually with color of adjacent walking surfaces.
 - b. Provide either light-on-dark, or dark-on-light, in accordance with CBC Section 11B-705.1.1.3.
 - 3. Provide surfaces that differs from adjoining surfaces in resiliency or sound-on-cane contact in accordance with CBC Section 11B-705.1.1.4.

1.08 WARRANTY

- A. Provide manufacturer's minimum 5 year warranty in writing for period of five years from date of final completion complying with DSA Bulletin 10/31/02, revised 04/09/08.
 - 1. Warranty includes defective work, breakage, deformation, fading and chalking of finishes, and loosening of tiles.

PART 2 PRODUCTS

2.01 MANUFACTURERS/PRODUCTS

- A. Provide detectable warning surface tile by one of following:
 - 1. Engineered Plastics, Inc. (Armor-Tile)
 - 2. ADA Solutions, Inc.
 - 3. Armorcast Products

- B. Basis-of-Design Product:
 - 1. Vitrified Polymer Composite (VPC) Cast in Place Detectable Warning Surface Tiles specified is based on Armor-Tile as manufactured by Engineered Plastics Inc.
 - 2. Existing engineered and field tested products which are subject to compliance with requirements, may be incorporated in Work and provided they meet or exceed specified test criteria and characteristics.

2.02 MATERIALS

- A. Tiles:
 - 1. Made of homogeneous vitrified polymer composite (VPC) material with ultraviolet stabilized coating, to minimize color wear
 - 2. Provide with slip-resistant surface, incorporating “truncated domes” of same material.
 - 3. Nominal thickness of detectable warning tile: 1/8 inch, exclusive of height of truncated domes.
 - 4. Provide tiles complying with applicable requirements of CBC, Chapter 11B.

- B. Vitrified Polymer Composite (VPC) cast-in-place detectable warning surface tiles:
 - 1. Epoxy polymer composition with ultra violet coating employing aluminum oxide particles in truncated domes, conforming to following:
 - a. Compressive Strength per ASTM D 695:
 - 1) Not less than 18,000 psi.
 - b. Tensile Strength per ASTM D 638:
 - 1) Not less than 10,000 psi.
 - c. Flexural Strength per ASTM C 293 or D 790:
 - 1) Not less than 24,000 psi.
 - d. Water Absorption per ASTM D 570:
 - 1) Not to exceed 0.35 percent.
 - e. Slip Resistance:
 - 1) Minimum 0.9 for combined wet/dry static co-efficient of friction when tested per ASTM C 1028
 - f. Chemical Stain Resistance per ASTM D 543 or D 1038:
 - 1) Withstand without discoloration or staining minus 1 percent hydrochloric acid, urine, calcium chloride, stamp pad ink, gum and red aerosol paint.
 - g. Fire-Resistance per ASTM E 84:
 - 1) Flame Spread Index: Less than 15.
 - h. Accelerated Weathering per ASTM G 155:
 - 1) Exhibit following result for 3000 hours:
 - a) Delta E, less than 4.5: No deterioration, fading or chalking of surface of tile.

- i. Accelerated Aging and Freeze Thaw Test per ASTM D 1037 or C1026:
 - 1) Show no evidence of cracking, delamination, warpage, checking, blistering, color change, loosening of tiles, or other defects.
 - j. Salt and Spray Performance of Tile per ASTM B 117:
 - 1) Not show deterioration or other defects after 200 hours of exposure.
- C. Pattern/Dimension:
- 1. Provide detectable warning surface tile incorporating “in-line” pattern of truncated domes 0.2 inch in height, 0.9 inch minimum and 0.092 inch maximum diameter at base, and 0.45 inch minimum and 0.47 inch maximum diameter at top of dome.
 - 2. Space domes at 2.3 inches minimum to 2.4 inches maximum center-to-center, measured “in-line”
 - 3. Wheelchair Safety:
 - a. Provide field area of detectable warning surface consisting of non-slip surface with minimum of 40 degree to 90 degree raised points, 0.045 inch high, per square inch
- D. Color:
- 1. Unless otherwise indicated, provide detectable warning surface tiles in color specified in Article 1.07 A
 - 2. Provide color integral with detectable warning device tiles and not surface applied.
 - 3. Do not use paints or other surface coatings.
- E. Sealants:
- 1. Gray epoxy, two-component sealant.
 - a. Manufactured by Sika, Bostik or approved equal.
 - b. Complying with requirements of Section 07 9200.
 - 2. As supplied by tile manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION OF CAST-IN-PLACE TILES

- A. During concrete pouring and tile installation procedures, ensure adequate safety guidelines are in place and are in accordance with applicable industry and government standards.
- B. Prior to placement of cast in place detectable warning surface tiles, review manufacturer's shop drawings and layout drawing prepared by installation contractor to resolve issues related to pattern repeat, tile cuts, expansion joints, control joints, curves, end returns and surface interferences.
 - 1. Refer discrepancies to Architect.
- C. Physical Characteristics of Concrete:
 - 1. Consistent with Section 32-1313 specifications while maintaining slump range of 4 to 7 inches to permit solid placement of cast in place detectable warning surface tiles.
 - 2. Overly wet mix will cause tiles to float.
 - a. Furnish suitable weights such as concrete blocks or sandbags (25 lbs.)
 - 1) Place on each tile.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- D. Concrete pouring and finishing operations require typical mason's tools.
 - 1. Four foot long level with electronic slope readout, 25 lb. weights, and large non-marring rubber mallet are specific to installation of cast-in-place detectable warning surface tiles.
 - 2. Vibrating mechanism may be employed.
 - a. Fix vibrating unit to soft wood base at least 1 foot square.
- E. Pour and finish concrete true and smooth to required dimensions and slope prior to tile placement.
 - 1. Immediately after pouring concrete, use electronic level to check that required slope is achieved
 - 2. Place tile square and true to curb edge in accordance with approved shop drawings.
 - 3. Tamp or vibrate Tiles into fresh concrete to ensure that field level of tile is flush to adjacent concrete surface.
 - a. Do not attempt to accomplish embedment process by stepping on tiles as this may cause uneven setting which can result in air voids under tile surface
 - 4. Shop drawings indicate that tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes.
 - a. Tolerance for elevation differences between tile and adjacent surface is 1/16 inch.
- F. Immediately after tile placement, tile elevation is to be checked to adjacent concrete.
 - 1. Set tile elevation consistent with shop drawings to permit water drainage to curb as design dictates.
 - 2. Ensure field surface of tile is flush with surrounding concrete and back of curb so that no ponding of possible on tile at back side of curb
- G. While concrete is workable, use 3/8 inch edging tool to create finished edge of concrete.
 - 1. Use steel trowel to finish concrete around tile perimeter, flush to field level of Tile.
- H. During and after tile installation and concrete curing stage, do not allow walking, leaning, or external forces placed on tile to rock tile, causing void between underside of tile and concrete.
- I. Following tile placement, review installation tolerances to shop drawings and adjust tile before concrete sets.
 - 1. Place suitable weights of 25 lbs. on each tile and additional weights at tile to tile assemblies as necessary to ensure solid contact of tile underside to concrete.
- J. Following curing of concrete, remove protective plastic wrap from tile face by cutting plastic with sharp knife tight to concrete/tile interface.
 - 1. Where concrete bleeding occurs between tiles, soft brass wire brush will clean residue without damage to tile surface.
- K. Individual tiles may be bolted together with 1/4 inch bolts or equivalent hardware to help ensure adjacent tiles are flush to each other during installation process.
 - 1. Place tape or sealant on underside of bolted edge to prevent concrete from rising up between tiles during installation

- a. Replace protective plastic wrap peeled back to facilitate bolting or cutting by taping to ensure tile surface remains free of concrete during installation process
2. Replace sound-amplifying plates on underside of tile dislodged during handling or cutting and secure with construction adhesive
 - a. Air gap created between plates and bottom of tile is important in preserving sound on cane audible properties of tiles.
3. Applications of Sealant:
 - a. Install level to adjacent surface and straight line formed to tile edge.
 - b. Mask off tile faces with duct tape to ensure clean definition of sealant to adjacent surfaces.

3.02 PAVEMENT MARKINGS

- A. Refer to Section 32 1723 for coordination of pavement markings with tactile warning surface locations.

3.03 CLEANING AND PROTECTING

- A. Protect panels against damage during construction period to comply with tile manufacturer's specification.
- B. Protect tiles against damage from rolling loads following installation by covering with plywood or hardboard.
- C. Clean tactile tiles not more than four days prior to date scheduled for inspection intended to establish date of Substantial Completion in each area of Project.
 1. Clean tile by method specified by manufacturer.
- D. Comply with manufacturer's maintenance manual for cleaning and maintaining tile surface.
 1. Perform recommended annual inspections for safety and tile integrity
- E. Remove and legally dispose of rubbish, debris, and waste materials off Project Site.
- F. Protect Work until Substantial Completion.

END OF SECTION 32 1726

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 32 1818

PLAYGROUND SURFACING TILES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Resilient, Interlocking, Playground Safety Surfacing Tiles.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 11 6818: Installation of Play Structure; includes shade structure.
 - 3. Section 31 1000: Earthwork; grading and subsurface preparation.
 - 4. Section 32 1313: Concrete Paving; concrete curbs.

1.02 REFERENCES

- A. California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current edition.
 - 1. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.
- B. ASTM International (ASTM):
 - 1. ASTM D 412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension
 - 2. ASTM D 624 – Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
 - 3. ASTM D 2047 – Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
 - 4. ASTM D 2859 – Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
 - 5. ASTM D 3676 – Standard Specification for Rubber Cellular Cushion Used for Carpet or Rug Underlay.
 - 6. ASTM F 1292 – Standard Specification for Impact Attenuation of Surfacing Materials within the Use Zone of Playground Equipment
 - 7. ASTM F 1487 – Standard Consumer Safety Performance Specification for Playground Equipment for Public Use.
 - 8. ASTM F 1951 – Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
 - 9. ASTM F 2479 – Standard Guide for Specification, Purchase, Installation, and Maintenance of Poured-In-Place playground Surfacing.
- C. U.S. Consumer Products Safety Commission (CPSC):
 - 1. Public Playground Safety Handbook.
- D. International Play Equipment Manufacturers Association (IPEMA):
 - 1. IPEMA Safety Certification Standards.

1.03 SYSTEM DESCRIPTION

- A. Playground Surfacing:
 - 1. Resilient, interlocking, playground safety surfacing tiles system consisting of:
 - a. Compression molded recycled rubber and binding agents, with adhesive at joints over rubber sheeting.
 - b. Provide system supported on crushed aggregate base with top layer of fines.
 - c. Scarify and compact native soils sub-grade to 90 percent complying with ASTM D 1557.
 - 2. Slope tiles to drain.
 - a. Do not exceed 2 percent in any direction.
 - b. Contain tiles with concrete curb as detailed on Drawings.

1.04 SUBMITTALS

- A. Electronic Submittals:
 - 1. Refer to Section 01 3300 for requirements for making electronic submittals.
- B. Product Data:
 - 1. Copies of manufacturer's written specifications and warranty.
 - a. Include manufacturer's descriptive data and installation instructions
- C. Shop Drawings:
 - 1. Manufacturer's details showing size and depths of tiles and sub-base materials, anchoring systems, and edge details.
- D. Samples:
 - 1. Materials proposed for use on Project:
 - a. Minimum of four samples of each tile as follows:
 - 1) Full size tiles.
 - 2) Partial Tiles:
 - a) Minimum 6 inches x 6 inches.
- E. Signed Statements:
 - 1. By authorized official certifying that surfacing system meets requirements of ASTM F 1292 for head-first fall from highest accessible portion of specified playground equipment.
 - 2. From manufacturer of tile surfacing, attesting that materials under this Section will be installed only by trained installers.
- F. Certificates:
 - 1. Furnish Certificate of Insurance from manufacturer of tile surfacing for use as playground safety surfacing, covering general and product liability.
 - a. Comply with requirements in Division 00 General Conditions for required insurance coverage.
 - 2. Furnish mandatory IPEMA Certification.
 - 3. Manufacturer's certificate of compliance indicating materials comply with specified requirements.
 - 4. Maintenance Instructions:
 - a. Manufacturer's maintenance and cleaning instructions.
 - 5. Warranty:
 - a. Manufacturer's standard warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Tile surfaces manufactured and installed by trained, experienced company employees or certified installers who have successfully completed Certified Installers Training Program required by manufacturer.
- B. Installer Qualifications:
 - 1. Upon request, provide list of at least five installations where products similar to those proposed for use have been installed and have been in service for minimum period of 3 years.
 - 2. List to include owner or purchaser, address of installation, date of installation, contact person, and phone number.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
 - 1. Deliver materials to Project Site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage:
 - 1. Store materials in accordance with manufacturer's instructions.
 - 2. Playground Safety Surfacing Tiles:
 - a. Store tiles in dry area at minimum temperature of 50 degrees F for minimum of 72 hours before installation.
 - b. Protect tiles from direct sunlight before installation.
 - 3. Adhesive:
 - a. Store adhesive in dry area at minimum temperature of 50 degrees F.
- C. Handling:
 - 1. Protect materials during handling and installation to prevent damage.
- D. Tile Temperature:
 - 1. Ensure surface temperature of playground safety surfacing tiles is minimum of 50 degrees F at time of installation.
- E. Air Temperature:
 - 1. Ensure air temperature is minimum of 40 degrees F for minimum of 24 hours before and during installation.
 - 2. Consult manufacturer's installation instructions for modified installation procedure when tile or air temperatures are above 85 degrees F.

1.07 PROJECT CONDITIONS

- A. Install tile surfacing on dry sub-surface, with no prospect of rain within initial adhesive curing period, and within recommended temperature range of manufacturer.
- B. Installation in weather conditions of high heat, (over 85 degrees F), or cold (less than 50 degrees F), or high humidity (70 percent) may affect cure time and structural integrity of final product.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

1. Consult manufacturer for modified installation procedures in weather conditions beyond this range.
- C. Manufacturer's representative reserves right to control installation based on such environmental factors, subject to notification of Owner and Architect.

1.08 SEQUENCING AND SCHEDULING

- A. Install tile surfacing system after playground equipment, swings, signs, and other items that will occur within surfacing area are installed.
 1. Coordinate surface installation review by manufacturer's representative
 - a. Notify representative in writing within two weeks prior to installation.

1.09 WARRANTY

- A. Manufacturer's Warranty:
 1. Warrants specified playground surfacing system complies with requirements of ASTM F 1292 for impact attenuation Head Injury Criteria (HIC) score of less than 700.
 - a. Warranty does not cover normal wear and tear.
 2. Materials and Workmanship:
 - a. Warrant playground safety surfacing against defects in materials and workmanship for 10 years from date of Substantial Completion.
- B. Performance Warranty:
 1. Warrant playground safety surfacing tiles will meet drop height performance requirements of ASTM F 1292 for 10 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Basis-of-Design:
 1. Design of playground surfacing system is based upon DuraSafe Tiles as manufactured by SofSURFACES Inc., Petrolia, Ontario, Canada

2.02 PLAYGROUND SURFACING TILES

- A. Tiles
 1. Description:
 - a. Resilient, interlocking, playground safety surfacing tiles.
 2. Compliance:
 - a. Meets or exceeds CPSC guidelines for impact attenuation.
 3. Material:
 - a. Compression-molded, recycled rubber and binding agents.
 4. Tile Locking:
 - a. U-shaped male and female configuration on 4 sides to lock tiles to adjacent tiles.
 5. Top Edges:
 - a. Chamfered.
 6. Tile Bottom:
 - a. Hollow core stanchion pattern.

7. Wear Layer:
 - a. Plus Series:
 - 1) Combination of elongated SBR rubber and granulated crumb rubber.
 - 2) Pigmentation used to achieve color.
 - 3) Minimum Thickness: 0.375 inch.
8. Size:
 - a. Nominal Size: 24-1/8 inches by 24-1/8 inches.
 - a. Installed Size: 24 inches by 24 inches.
9. Thickness:
 - a. Critical Fall Height:
 - 1) 8 Feet: 4.25 inches.
10. Minimum Tile Weight:
 - a. 4.25 Inch Thickness: 33.98 pounds.
11. Colors:
 - a. As selected by District.
12. Product and Manufacturer:
 - b. DuraSAFE Series Plus SofTILE KrosLOCK by SofSURFACES Inc.

2.03 MATERIALS

- A. Test Results:
 1. Impact Attenuation:
 - a. Conforming to ASTM F 1292:
 - 1) G-Max Score: Less than 125.
 - 2) Head Injury Criteria (HIC) Score: Less than 700.
 2. Freeze Thaw:
 - a. Conforming to ASTM C 67:
 - 1) No deterioration.
 3. Rubber Deterioration/Air Oven:
 - a. Conforming to ASTM D 573:
 - 1) No deterioration.
 4. Slip Resistance:
 - a. Conforming to ASTM E 303:
 - 1) Dry: 51 minimum.
 - 2) Wet: 44 minimum.
 - b. Conforming to ASTM D 2047:
 - 1) Plus Series: 0.533.
 5. Tensile Strength:
 - a. Conforming to ASTM D 412:
 - 1) Plus Series: 661 Mpa.
 6. Elongation at Break:
 - a. Conforming to ASTM D 412:
 - 1) Plus Series: 68.5 percent.
 7. Tear Strength, Conforming to ASTM D 624:
 - a. Plus Series: 2.2 kNm
 8. Flammability:
 - a. Conforming to ASTM D 2859, Methenamine Pill Test:
 - 1) Pass
 9. Density:
 - a. Conforming to ASTM D 3676:
 - 1) Plus Series: 817 kg/m³.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

10. Taber Abrasion, Wear index:
 - a. Conforming to ASTM C 501:
 - 1) Plus Series: 205

2.04 ACCESSORIES

- A. Corners:
 1. Prefabricated outside and inside corners.
 2. Material:
 - a. Same as playground safety surfacing tiles.
- B. Adhesive:
 1. Furnished by surfacing manufacturer.
 2. Conform to requirements of SCAQMD Rule 1168.

2.05 PERFORMANCE

- A. Area Safety:
 1. Rubber tiles in place within playground equipment use zones:
 - a. Meet or exceed performance requirements of CPSC, CBC Chapter 11B, and Fall Height Test ASTM F1292.
 2. Surface must yield both peak deceleration of no more than 200 G-max and Head Injury Criteria (HIC) value of no more than 700 for head-first fall from highest accessible portion of play equipment installed.
 3. IPEMA certification is required.
 - a. Conduct laboratory test used to determine critical fall height on surfacing material samples identical in design, materials, components, and thickness, and manufactured as installed playground surface.
 - 1) Comply with requirements of ASTM F 1292.
- B. Accessibility:
 1. Provide outdoor play areas complying with requirements of CBC, Chapter 11B.
 2. Provide interlocking tile surfaces intended to serve as accessible paths of travel for persons with disabilities that are firm, stable, slip resistant, and meet requirements of ASTM F 1292.

PART 3 EXECUTION

3.01 SITE PREPARATION BY CONTRACTOR

- A. Finished Grade/Slope:
 1. Verify following:
 - a. Finished elevations or adjacent areas are as indicated on Drawings,
 - b. Appropriate sub-grade elevation has been established for safety surface to be installed,
 - c. Subsurface has been installed per Drawings and meets accessibility and use zones requirements.
- B. Aggregate Sub Base:
 1. Tolerance of Aggregate Sub-Base: Within 1/4 inch in 10 feet in any direction.
 2. Verify that aggregate subbase has been fully compacted in accordance with following:

- a. Compacted Aggregate Sub-Base: 4 inches of 3/4 inch minus irregular stone with 1/4 inch of fines above compacted to 95 percent in 2 inch watered lifts.

3.02 INSTALLATION

- A. Resilient Tiles Surfacing:
 1. Install playground safety surfacing tiles in accordance with manufacturer's instructions at locations indicated on Drawings.
- A. Ensure prepared subsurface and tiles are dry and clean.
- B. Layout tile surface in accordance with manufacturer's instructions.
- C. Apply adhesive in accordance with manufacturer's instructions for tile-to-tile as well as tile-to-base for all keystone and strategic tile rows.
- D. Installation to be completed by factory trained and certified installer.

3.03 FIELD QUALITY CONTROL

- A. Manufacturer Services:
 1. Manufacturer's Representative who is experienced in installation of playground safety surfacing for resilient tile safety surfacing.
 - a. Notify of construction schedule and attend pre-construction meeting.
 - b. Meet with installation contractor and crew prior to start of installation.
 - c. Supervise installation to ensure that system meets specified impact attenuation requirements.
- B. Installed Surface Performance Test:
 1. Conforming to ASTM F1292:
 - a. Perform impact attenuation testing according to ASTM F1292 in presence of Owner's representative within 30 days of installation.
 - b. Confirm impact attenuation performance of surfacing tiles as follows:
 - 1) G-Max Score: Less than 125
 - 2) Head Injury Criteria (HIC) Score: Less than 700
 2. Test Equipment Operator Qualifications:
 - a. National Recreation and Parks Association/National Playground Safety Institute (NRPA/NPSI) Certified Playground Safety Inspector (CPSI).
 - 1) Trained in the proper operation of Triax test equipment by competent agency.
 3. Determine compliance with ASTM F 1292, unless otherwise specified in this Section.

3.04 CLEANING

- A. Remove adhesive spills from playground safety surfacing tiles in accordance with manufacturer's instructions.
- B. Clean tiles in accordance with manufacturer's instructions
- C. Clean up Work to minimize excessive adhesive on adjacent surfaces or play equipment.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

1. Promptly clean spills of excess adhesive.
- D. Flood Test:
1. Hose off finished surface with clean water to confirm drainage and to remove dust and dirt.
 2. Replace and relevel tiles and base where standing water over 1/8 inch in depth does not drain within one hour.

3.05 PROTECTION

- A. Allow safety surface to fully cure in accordance with manufacturer's instructions.
1. Protect surface from traffic during curing period of 48 hours or as instructed by manufacturer.
- B. Protect playground safety surfacing tiles from foot traffic for minimum of 12 hours after installation.
- C. Protect completed tiles from damage during construction and until date of Substantial Completion.

END OF SECTION 32 1818

SECTION 32 8400

PLANTING IRRIGATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Following, as it applies to relocation of existing planting irrigation system:
 - a. Pipes, tubes, and fittings.
 - b. Manual valves.
 - c. Pressure-reducing valves.
 - d. Automatic control valves.
 - e. Transition fittings.
 - f. Dielectric fittings.
 - g. Miscellaneous piping specialties.
 - h. Sprinklers.
 - i. Quick couplers.
 - j. Drip irrigation specialties.
 - k. Controllers.
 - l. Boxes for automatic control valves.

1.02 DEFINITIONS

- A. Circuit Piping:
1. Downstream from control valves to sprinklers, specialties, and drain valves.
 2. Piping is under pressure during flow.
- B. Drain Piping:
1. Downstream from circuit-piping drain valves.
 2. Piping is not under pressure.
- C. ET Controllers:
1. EvapoTranspiration Controllers.
 - a. Irrigation controllers, which use some method of weather-based adjustment of irrigation.
 - b. Adjusting methods include use of historical monthly averages of ET, broadcasting of ET measurements, or use of on-site sensors to track ET.
- D. Main Piping:
1. Downstream from point of connection to water distribution piping to, and including, control valves.
 2. Piping is under water-distribution-system pressure.
- E. Low Voltage:
1. As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.03 SUBMITTALS

- A. Product Data:
 - 1. Pipes, tubes, and fittings.
 - 2. Manual valves.
 - 3. Pressure-reducing valves.
 - 4. Automatic control valves.
 - 5. Transition fittings.
 - 6. Dielectric fittings.
 - 7. Miscellaneous piping specialties.
 - 8. Sprinklers.
 - 9. Quick couplers.
 - 10. Drip irrigation specialties.
 - 11. Controllers.
 - 12. Boxes for automatic control valves.
 - 13. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

- B. Wiring Diagrams:
 - 1. For power, signal, and control wiring.

- C. Coordination Drawings:
 - 1. Irrigation systems, drawn to scale, on which components are indicated and coordinated with each other, using input from installers of items involved.
 - 2. Include adjustments necessary to avoid plantings and obstructions, such as signs and light standards.

- D. Zoning Chart:
 - 1. Indicate each irrigation zone and its control valve.

- E. Controller Timing Schedule:
 - 1. Indicate timing settings for each automatic controller zone.

- F. Field Quality-Control Submittals:
 - 1. Field quality-control reports.

- G. Qualification Statements: For installer.

- H. Operation and Maintenance Data:
 - 1. For sprinklers, controllers, and automatic control valves to include in operation and maintenance manuals.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Company that employs Certified Irrigation Designer - Landscape qualified by Irrigation Association Professional Class member of American Society of Irrigation Consultants Professional Technical Class member of American Society of Irrigation Consultants.

- B. Electrical Components, Devices, and Accessories:
 - 1. Listed and labeled as defined in NFPA 70, by qualified testing agency, and marked for intended location and application.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver piping with factory-applied end caps.
 - 1. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and entrance of dirt, debris, and moisture.
- B. Store plastic piping protected from direct sunlight.
 - 1. Support piping to prevent sagging and bending.

1.06 FIELD CONDITIONS

- A. Interruption of Existing Water Service:
 - 1. Do not interrupt water service to facilities occupied by Owner or others unless permitted under following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 2. Notify Owner no fewer than two days in advance of proposed interruption of water service.
 - 3. Do not proceed with interruption of water service without Owner's written permission.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Irrigation Zone Control:
 - 1. Automatic operation with controller and automatic control valves.
- B. Location of Sprinklers and Specialties:
 - 1. Design location is approximate.
 - 2. Make minor adjustments necessary to avoid plantings and obstructions, such as signs and light standards.
 - 3. Maintain 100 percent irrigation coverage of areas indicated.
- C. Minimum Working Pressures:
 - 1. Following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:
 - a. Irrigation Main Piping: 200 psig.
 - b. Circuit Piping: 150 psig.

2.02 PIPES, TUBES, AND FITTINGS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.
- B. Hard Copper Tube:
 - 1. ASTM B88, Type L, water tube, drawn temper.
 - 2. Copper Pressure Fittings:
 - a. ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper solder-joint fittings. Furnish wrought-copper fittings if indicated.
 - 3. Bronze Flanges:
 - a. ASME B16.24, Class 150, with solder-joint end.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

4. Copper Unions:
 - a. MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.
- C. PE Pipe with Controlled OD:
 1. ASTM D3035, PE 3408 compound, SDR 11.
 2. PE Socket-Type Fittings: ASTM D2683.
- D. PE Pressure Pipe:
 1. AWWA C906, with DR of 7.3, 9, or 9.3 and PE compound number required to give pressure rating of not less than 160 psig, or 200 psig.
 - a. PE Socket-Type Fittings: ASTM D2683.
- E. PVC Pipe:
 1. ASTM D1785, PVC 1120 compound, Schedules 40 and 80.
 2. PVC Socket Fittings:
 - a. ASTM D2466, Schedules 40 and 80.
 3. PVC Threaded Fittings:
 - a. ASTM D2464, Schedule 80.
 4. PVC Socket Unions:
 - a. Construction similar to that of MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.
- F. PVC Pipe, Pressure Rated:
 1. ASTM D2241, PVC 1120 compound, SDR 21.
 2. PVC Socket Fittings:
 - a. ASTM D2467, Schedule 80.
 3. PVC Socket Unions:
 - a. Construction similar to that of MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.

2.03 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials:
 1. AWWA C110, rubber, flat face, 1/8 inch thick unless otherwise indicated.
 2. Full-face or ring type unless otherwise indicated.
- B. Brazing Filler Metals:
 1. AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.
- C. Solder Filler Metals:
 1. ASTM B32, lead-free alloys. Include water-flushable flux in accordance with ASTM B813.
- D. Solvent Cements for Joining PVC Piping:
 1. ASTM D2564. Include primer in accordance with ASTM F656.
- E. Plastic, Pipe-Flange Gasket, Bolts, and Nuts:
 1. Type and material recommended by piping system manufacturer unless otherwise indicated.

2.04 TRANSITION FITTINGS

- A. General Requirements:
 - 1. Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

2.05 DIELECTRIC FITTINGS

- A. General Requirements:
 - 1. Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.

2.06 SPRINKLERS

- A. General Requirements:
 - 1. Designed for uniform coverage over entire spray area indicated at available water pressure.

2.07 BOXES FOR AUTOMATIC CONTROL VALVES

- A. Drainage Backfill:
 - 1. Cleaned gravel or crushed stone, graded from 3/4 inch minimum to 3 inches maximum.

PART 3 - EXECUTION

3.01 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Section 31 1000.
- B. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.
- C. Provide minimum cover over top of underground piping according to following:
 - 1. Irrigation Main Piping:
 - a. Minimum depth of 36 inches below finished grade, or not less than 18 inches below average local frost depth, whichever is deeper.
 - 2. Circuit Piping: 12 inches.
 - 3. Sleeves: 24 inches.

3.02 PREPARATION

- A. Set stakes to identify locations of proposed irrigation system.
 - 1. Obtain Architect's approval before excavation.

3.03 INSTALLATION OF PIPING

- A. Location and Arrangement:
 - 1. Drawings indicate location and arrangement of piping systems.
 - 2. Install piping as indicated unless deviations are approved on Coordination Drawings.
- B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- C. Install piping free of sags and bends.
- D. Install groups of pipes parallel to each other, spaced to permit valve servicing.
- E. Install fittings for changes in direction and branch connections.
- F. Install unions adjacent to valves and to final connections to other components with NPS 2 or smaller pipe connection.
- G. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.
- H. Install underground thermoplastic piping in accordance with ASTM D2774 and ASTM.
- I. Install expansion loops in control-valve boxes for plastic piping.
- J. Lay piping on solid subbase, uniformly sloped without humps or depressions.
- K. Install ductile-iron piping in accordance with AWWA C600.
- L. Install PVC piping in dry weather when temperature is above 40 deg F. Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.
- M. Install water regulators with shutoff valve and strainer on inlet and pressure gage on outlet. Install shutoff valve on outlet. Install aboveground or in control-valve boxes.
- N. Install piping in sleeves under parking lots, roadways, and sidewalks.
- O. Install sleeves made of Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.
- P. Install transition fittings for plastic-to-metal pipe connections according to the following:
 - 1. Underground Piping:
 - a. NPS 1-1/2 and Smaller: Plastic-to-metal transition fittings.
 - b. NPS 2 and Larger: AWWA transition couplings.
- Q. Install dielectric fittings for dissimilar-metal pipe connections according to the following:
 - 1. Underground Piping:
 - a. NPS 2 and Smaller: Dielectric coupling or dielectric nipple.
 - b. NPS 2-1/2 and Larger: Prohibited except in control-valve box.
 - 2. Piping in Control-Valve Boxes:
 - a. NPS 2 and Smaller: Dielectric union.
 - b. NPS 2-1/2 to NPS 4: Dielectric flange.

3.04 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

- C. Threaded Joints:
 - 1. Thread pipe with tapered pipe threads in accordance with ASME B1.20.1.
 - 2. Cut threads full and clean using sharp dies.
 - 3. Ream threaded pipe ends to remove burrs and restore full ID.
 - 4. Join pipe fittings and valves as follows:
 - a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 5. Damaged Threads:
 - a. Do not use pipe or pipe fittings with threads that are corroded or damaged.
 - b. Do not use pipe sections that have cracked or open welds.
- D. Flanged Joints:
 - 1. Select rubber gasket material of size, type, and thickness for service application.
 - 2. Install gasket concentrically positioned.
 - a. Use suitable lubricants on bolt threads.
- E. Ductile-Iron Piping Gasketed Joints:
 - 1. Comply with AWWA C600 and AWWA M41.
- F. Copper-Tubing Brazed Joints:
 - 1. Construct joints in accordance with CDA's "Copper Tube Handbook," using copper-phosphorus brazing filler metal.
- G. Copper-Tubing Soldered Joints:
 - 1. Apply ASTM B813 water-flushable flux to tube end unless otherwise indicated.
 - 2. Construct joints in accordance with ASTM B828 or CDA's "Copper Tube Handbook," using lead-free solder alloy (0.20 percent maximum lead content) complying with ASTM B32.
- H. PE Piping Fastener Joints:
 - 1. Join with insert fittings and bands or fasteners in accordance with piping manufacturer's written instructions.
- I. PVC Piping Solvent-Cemented Joints:
 - 1. Clean and dry joining surfaces.
 - a. Join pipe and fittings in accordance with the following:
 - 1) Comply with ASTM F402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2) PVC Pressure Piping: Join schedule number, ASTM D1785, PVC pipe and PVC socket fittings in accordance with ASTM D2672.
 - b. Join other-than-schedule-number PVC pipe and socket fittings in accordance with ASTM D2855.
 - 2. PVC Nonpressure Piping:
 - a. Join in accordance with ASTM D2855.

3.05 INSTALLATION OF VALVES

- A. Underground Iron Gate Valves, Resilient Seat:
 - 1. Comply with AWWA C600 and AWWA M44.
 - a. Install in valve casing with top flush with grade.
 - 2. Install valves and PVC pipe with restrained, gasketed joints.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWNDALE ELEMENTARY SCHOOL DISTRICT**

- B. Pressure-Reducing Valves:
 - 1. Install in boxes for automatic control valves or aboveground between shutoff valves.
- C. Throttling Valves:
 - 1. Install in underground piping in boxes for automatic control valves.
- D. Drain Valves:
 - 1. Install in underground piping in boxes for automatic control valves.

3.06 INSTALLATION OF SPRINKLERS

- A. Install sprinklers after hydrostatic test is completed.
- B. Install sprinklers at manufacturer's recommended heights.
- C. Locate part-circle sprinklers to maintain minimum distance of 6 inches from walls and 24 inches from other boundaries unless otherwise indicated.

3.07 INSTALLATION OF DRIP IRRIGATION SPECIALTIES

- A. Install freestanding emitters on pipe riser to mounting height indicated.
- B. Install manifold emitter systems with tubing to emitters.
 - 1. Plug unused manifold outlets. Install emitters on off-ground supports at height indicated.
- C. Install multiple-outlet emitter systems with tubing to outlets.
 - 1. Plug unused emitter outlets. Install outlets on off-ground supports at height indicated.
- D. Install drip tubes with direct-attached emitters on ground.
- E. Install drip tubes with remote discharge on ground with outlets on off-ground supports at height indicated.
- F. Install off-ground supports of length required for indicated mounted height of device.
- G. Install application pressure regulators and filter units in piping near device being protected, and in control-valve boxes.
- H. Install air relief valves and vacuum relief valves in piping, and in control-valve boxes.

3.08 INSTALLATION OF AUTOMATIC IRRIGATION CONTROL SYSTEM

- A. Equipment Mounting, Interior:
 - 1. Install controllers on interior concrete bases.
 - a. Place and secure anchorage devices.
 - 1) Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - b. Install anchor bolts to elevations required for proper attachment to supported equipment.

- B. Equipment Mounting, Exterior:
 - 1. Install exterior freestanding controllers on precast concrete bases.
 - 2. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 3. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Install control cable in same trench as irrigation piping and at least 2 inches below or beside piping.
 - 1. Provide conductors of size not smaller than recommended by controller manufacturer.
 - 2. Install cable in separate sleeve under paved areas.

3.09 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.
- C. Connect wiring between controllers and automatic control valves.

3.10 IDENTIFICATION

- A. Equipment Nameplates and Signs:
 - 1. Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.
 - 2. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
- B. Warning Tapes:
 - 1. Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches.
 - 2. Refer to Section 31 1000 for warning tapes.

3.11 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 - 1. Manufacturer's Field Service with Test Assistance:
 - a. Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 4. Irrigation system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.12 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
1. Complete installation and startup checks in accordance with manufacturer's written instructions.
 2. Verify that controllers are installed and connected in accordance with the Contract Documents.
 3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.13 ADJUSTING

- A. Adjust settings of controllers.
- B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.
- C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with, or not more than 1/2 inch above, finish grade.

3.14 CLEANING

- A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.15 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic control valves, and controllers.

3.16 PIPING SCHEDULE

- A. Install components having pressure rating equal to or greater than system operating pressure.
- B. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.
- C. Underground Irrigation Main Piping:
1. NPS 4 and Smaller:
 - a. Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.
 - b. Schedule 80, PVC pipe; Schedule 80, threaded PVC fittings; and threaded joints.
 - c. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent-cemented joints.

- D. Circuit Piping:
 - 1. NPS 2 and Smaller:
 - a. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
 - b. SDR 26, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent-cemented joints.
- E. Underground Branches and Offsets at Sprinklers and Devices: Schedule 80, PVC pipe; threaded PVC fittings; and threaded joints.
 - 1. Option: Plastic swing-joint assemblies, with offsets for flexible joints, manufactured for this application.

3.17 VALVE SCHEDULE

- A. Underground, Shutoff-Duty Valves: Use the following:
 - 1. NPS 2 and Smaller: Curb valve, curb-valve casing, and shutoff rod.
- B. Aboveground, Shutoff-Duty Valves:
 - 1. NPS 2 and Smaller:
 - a. Brass, Bronze ball valve.
 - b. Bronze gate valve.
- C. Throttling-Duty Valves:
 - 1. NPS 2 and Smaller:
 - a. Bronze automatic control valve.
 - b. Brass or bronze ball valve.
 - 2. NPS 2-1/2 and NPS 3:
 - 3. Bronze automatic control valve.
 - 4. Iron ball valve.

END OF SECTION 32 8400

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

SECTION 32 9343

TREE PLANTING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Labor, materials, equipment and services necessary for and incidental to completing Tree Planting as designated, including, but not limited to, following to complete planting of trees:
 - a. Soil testing approvals.
 - b. Soil preparation.
 - c. Finish grading.
 - d. Furnishing and installation of new trees.
 - e. Furnishing and installation of required fertilizers, planting backfill materials, and topsoil as required.
 - f. Dressing and miscellaneous materials.
 - g. Providing tree establishment (30 days).
 - h. Providing tree maintenance (90 days).
 - i. Cleanup of tree planting areas.
 - j. One year guarantee on trees.
- B. Related Sections:
1. Section 01 5000: Temporary Facilities and Controls
 2. Section 31 1000: Earthwork; backfill and grading around trees.
 3. Section 32 8400: Planting Irrigation
- C. Related Requirements:
1. Prior to tree planting and pruning, notify following:
 - a. Architect and Owner of schedule of operation.
 - b. Appropriate utility companies for flagging and coordination of service disconnection as necessary to complete Work.
 - c. Coordination with work of other trades as required.

1.02 REFERENCES

- A. Tree Care Industry Association (TCIA):
1. ANSI 300 – Tree Care Standards
- B. Public Works Standards, Inc.:
1. Standard Specifications for Public Works Construction (SSPWC):
 - a. The "Greenbook"; current edition.
 2. Standard Plans for Public Works Construction (SPPWC); current edition.

1.03 DESCRIPTION

- A. Remove other vegetation as necessary and as directed by Architect to accommodate new tree planting.
1. Prepare areas to be planted as directed by Architect.

1.04 SUBMITTALS

- A. List of equipment, procedure, and labor force anticipated for use for tree planting for approval by Architect.
- B. Schedule by day indicating trees to be planted.
 - 1. Note materials requiring root pruning.
 - a. Planting schedule is to begin at end of specified root pruning period.
 - 2. Obtain permits required by authority having jurisdiction.
- C. Proposed methods and schedule for effecting tree and plant protection for approval.

1.05 QUALITY ASSURANCE

- A. Contractor's Qualifications:
 - 1. Employ workers for planting of new trees having minimum of 10 years experience in planting of trees and be recognized by AmericanHort (formerly American Association of Nurserymen).
- B. Arborist:
 - 1. Engage certified/licensed Arborist to supervise transporting, planting, and pruning of trees.
- C. Comply with ANSI A300 for tree planting.
- D. Perform tree repair work for damage incurred during transportation and planting.
- E. Provide routine progress evaluation reports on planted trees until end of maintenance period.
- F. Trees and Related Material:
 - 1. Meet or exceed specifications of Federal, State and County laws requiring inspection for plant disease and insect control.
- G. Quality and Size Trees:
 - 1. Conform to current edition of "Horticultural Standards" for number one grade nursery stock as adopted by AmericanHort and California Department of Agriculture regulations.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Properly handle trees during transportation and planting so trunks will not be scarred or damaged and to avoid broken limbs.
 - 1. Repair broken limbs not causing tree to be rejected as follows:
 - a. Properly prune dead, dying, or damaged branches with clean, sharp equipment.
 - b. Remove injured bark and wood of tree wound with clean, sharp knife to point where healthy bark and wood make contact at their margins.
 - c. Inspect and treat wound for insect and disease.
 - d. Seal wounds with bituminous base wound paint for limbs greater than 3 inches in diameter.

- B. Transport trees on vehicles of adequate size to prevent overcrowding, broken limbs, foliage damage, or root ball damage.
- C. Keep root balls moist until planted
- D. Protect tree crowns with shade cloth to prevent desiccation and wind burn.
 - 1. Periodically spray Crowns with water to help ensure against desiccation.
- E. Handle trees only in ways and means accepted by landscaping industry and accepted by Architect.

1.07 MAINTENANCE

- A. Maintain relocated trees immediately after each item is planted and continued until 90-day watering period is completed, upon which time Owner will take over maintenance of materials following procedures and recommendations of contractor and specifications.

1.08 WARRANTY

- A. Guarantee trees installed under this contract against poor, inadequate, or inferior materials and workmanship.
 - 1. Warranty Period:
 - a. One year.
- B. Replace Trees found to be dead or in poor condition due to faulty materials or workmanship, as determined by Architect and District representative, by Contractor at his expense.
 - 1. Prior to re-planting, determine cause of tree decline to ensure success of newly planted material.
- C. Make replacement to same specifications required for original planting within five working days after written notification.
- D. Supply material and labor involved in replacing of trees Contractor at no additional cost to District.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Provide materials conforming to requirements of Section 212 of SSPWC, except as modified herein.
- B. Organic Composted Soil Amendment:
 - 1. Sieve % passing by total dry weight
 - 1/2" 100
 - 1/4" 95-100
 - 2. Salinity (ECe): <10.0 dS/m in saturation extract (ECe 1 to 5: <4.0 dS/m)
 - 3. pH: 6-8
 - 4. Boron: < 3.0 ppm in saturation extract
 - 5. SAR: < 6.0

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

6. Carbon to nitrogen ratio (C:N ratio): 15-35
 7. Organic content: > 40%
 8. Lime content: low to none
 9. Free of glass, metal, and visible plastics
- C. Commercial Fertilizer:
1. Post- Plant Fertilizer:
 - a. To maintain nitrogen availability, sulfur coated urea can be uniformly broadcast at a rate of 5 lbs. per 1000 sq. ft. every 60 to 90 days with first application occurring approximately 45 days after planting.
 - b. Application of complete fertilizer, such as 16-6-8 in early fall and again in early fall, will maintain good levels of phosphorous and potassium.
 - c. Fertilizers mentioned above would be appropriate for trees.
 - 1) Applications of sulfur coated urea should be made every 120 days, with first application 90 days after planting.
 - 2) Follow each fertilization with thorough irrigation.
 - 3) Once trees are well established, fertilizers can likely be applied less frequently, based on desired color and growth performance.
- D. Fill Materials:
1. As specified in Section 31 0000.

PART 3 EXECUTION

3.01 GENERAL

- A. Prior to start of Work of this Section, remove trash and deleterious materials on surface of the ground and legally disposed of complying with requirements of Section 017419.
- B. Perform installation conforming to requirements of Section 308 of SSPWC, except as modified herein.
- C. Locate trees as directed by Architect.
1. Spot containers and obtain Architect's approval prior to excavating pits
 2. Do not prune any plant material prior to delivery without specific approval by Architect.
- D. Pit Excavations:
1. Cut sides vertical.
 2. Diameter:
 - a. Double container or root ball size for 15 gallon and smaller plants.
 - b. One and one-half times diameter of containers 24 inch box and larger.
 3. Depth for plant material 24 inch box and smaller:
 - a. 6 inches deeper than container or root ball.
 4. Depth for plant material 36 inch box and larger:
 - a. Same depth as container or root ball plus 1 inch.
 5. If planter pits are excavated using power auger, break vertical sides with balling bar or spade.

3.02 PLANTING

- A. Trees:
1. Plant trees according to accepted procedures for new trees.
 - a. Verify final grades have been established before planting operations.
 - b. Ensure proposed planting pits drain by test-filling with water before planting.
 2. Continue watering and caring for trees employing established procedures.
 3. Mulch tree pit areas to reduce weeds, discourage foot traffic, conserve moisture, and minimize temperature fluctuations.
 4. Brace trunk and leave in place for approximately one year until trees are wind firm.
 5. Wrap trunks and structural branches of thin-barked trees to protect against sun scald and dehydration.
 - a. Retain through at least one growing season, and through cold season.
 6. Feed with diluted solution of Nitrogen-Phosphorus-Potassium (N-P-K) in solution form with soil needle, providing water, air, and nutrients.
 7. Where foliage is retarded, spray with soluble type of foliage feeder.
 8. At time of planting, fill air pockets and keep roots, especially feeder roots, moist, live, and healthy.
 - a. Use soil needles for watering new plants.
 - b. Direct fine spray at foliage to help harden-off new leaves.
 9. Do not install trees that have cracked or broken balls of earth when removed from container.
 10. Plant trees in manner that after settlement, crown of tree bears same relation to finish grade that it did to surface in its original container.
 11. Backfill tree pits with prepared mix in accordance with requirements of Section 31 0000, upon completion of rough grading.
 - a. After tree has been placed, add additional backfill to hole to cover approximately 1/2 of height of root ball.
 - b. At this stage, add water to top of partly filled hole to thoroughly saturate root ball and adjacent soil.
 - c. Backfill remainder of hole.
 12. Form shallow basin around edge of tree pit.
 13. Grade area around plants to finish grade.

3.03 STAKING AND GUYING

- A. Stake and guy trees according to established procedures.

3.04 WATERING

- A. Following planting, water trees daily for first two weeks, every other day for next three weeks, and every third day for balance of tree watering/maintenance period.
 1. Thoroughly saturate root ball to its full depth.
- B. Following planting, water trees as specified in this Section.
 1. Thoroughly saturate root ball to its full depth.
- C. Provide manual watering of trees for 90 days.
 1. After initial watering period, Contractor is responsible for complete removal of temporary watering systems.

3.05 ROOT PREPARATION

- A. Root prune trees at least 45 days before digging with clean, sharp equipment.
1. Maintain root pruned materials by watering, weeding, mowing, spraying, fertilizing, and other horticulture practices.
 2. After root pruning, backfill with good rooting medium, fertilize with organic fertilizer to promote root growth.
 3. Mulch to reduce weeds, discourage foot traffic, conserve moisture, and minimize temperature fluctuation.
- B. Root Ball Size Chart:
1. Root Ball Sizes:
 - a. According to minimum standards set forth in ANSI Z60.1.
 2. Trees – Minimum Ball Sizes:

<u>Caliper</u>	<u>Minimum Ball Diameter</u>
3-1/2" to 4"	28"
4" to 4-1/2"	30"
4-1/2" to 5"	32"
5" to 5-1/2"	34"

Larger sizes increase proportionally.
 3. Minimum Ball Depth:

<u>Ball Diameter</u>	<u>Depth</u>
Less than 20"	Not less than 75 percent of diameter.
20" to 30"	Not less than 65 percent of diameter.
30" to 48"	Not less than 60 percent of diameter.

3.06 CROWN PREPARATION

- A. Shade Trees:
1. Selectively prune and thin crown to remove approximately one third of branches.
 - a. Preserve basic shape and form of tree.
 - 1) Eliminate cross-branching and dead or diseased branches.
 2. Hand strip selected species of leaves following pruning and before moving.

3.07 HAND DIGGING

- A. Burlapping is required:
1. Trees that are burlapped for planting:
 - a. Comply and be handled as set forth in ANSI Z60.1.

3.08 CLEANING

- A. Site Clean Up:
1. Upon completion of Work, thoroughly clean Project Site.
 2. Comply with requirements specified in Section 01 7423 and following:
 - a. Remove equipment, unused materials, deleterious material, and surplus excavated material.
 - b. Fine grade disturbed areas and areas adjacent to transplanted trees to provide neat and uniform Site.
 - c. Correct damaged or altered existing structures, as result of tree transportation and planting Work.

END OF SECTION 32 9343

SECTION 33 4200

STORMWATER CONVEYANCE

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Storm drainage piping, fittings, and accessories.
 - 2. Connection of drainage system to municipal sewers.
 - 3. Catch basins
 - 4. Plant area drains
 - 5. Paved area drainage
 - 6. Site surface drainage

- B. Related Sections:
 - 1. Section 01 3119: Project Meetings; preinstallation meeting.
 - 2. Section 01 5000: Temporary Facilities and Controls; barricades
 - 3. Section 01 5713: Temporary Erosion and Sediment Controls
 - 4. Section 01 7419: Construction Waste Management and Disposal
 - 5. Section 01 7423: Cleaning; site cleaning.
 - 6. Section 01 7839: Project Record Documents
 - 7. Section 31 0000: Earthwork; excavating and backfilling of trenches.

1.02 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM C 76 – Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
 - 2. ASTM C 443 – Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
 - 3. ASTM C 969 – Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.
 - 4. ASTM D 1785 – Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
 - 5. ASTM D 2729 – Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fitting.

- B. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M 252 – Standard Specification for Corrugated Polyethylene Drainage Pipe.
 - 2. AASHTO M 294 – Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500 MM (12- to 60- in.) Diameter.

- A. Public Works Standards, Inc.:
 - 1. Standard Specifications for Public Works Construction (SSPWC):
 - a. The "Greenbook"; current edition.
 - 2. Standard Plans for Public Works Construction (SPPWC); current edition.

- C. American Water Works Association Standards, current edition.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

1.03 DEFINITIONS

- A. Bedding:
 - 1. Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.04 SUBMITTALS

- A. Product Data:
 - 1. Provide data indicating pipe, pipe accessories, and inlets.
- B. Manufacturer's Certificates:
 - 1. Certify that products meet or exceed municipal requirements.
- C. Manufacturer's Installation Instructions:
 - 1. Indicate special procedures required to install products specified.
- D. Field Quality Control Submittals:
 - 1. Document results of field quality control testing.
- E. Project Record Documents:
 - 1. Record location of pipe runs, connections, catch basins, cleanouts, manholes, and invert elevations.
 - a. Comply with requirements of Section 01 7839.
 - 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.05 QUALITY ASSURANCE

- A. Coordination:
 - 1. Coordinate installation of storm drain with size, location and installation of service utilities.
- B. Preinstallation Meeting:
 - 1. Conduct meeting one week prior to start of Work of this Section in accordance with requirements of Section 01 3119.
 - a. Require attendance by affected installers.

1.06 SEQUENCING

- A. Sequencing:
 - 1. Ensure that utility connections are achieved in an orderly and expeditious manner.

1.07 REGULATORY REQUIREMENTS

- A. Conform to SSPWC code for materials and installation of Work.

PART 2 PRODUCTS

2.01 STORM DRAIN PIPE MATERIALS

- A. Provide products that comply with applicable codes.

- B. Plastic Pipe:
 - 1. Poly Vinyl Chloride (PVC) material:
 - a. Diameter as indicated
 - b. Bell and Spigot style
 - c. Solvent sealed joint end.
 - 2. Conforming to ASTM D 1785, Schedule 40

2.02 PIPE ACCESSORIES

- A. Fittings:
 - 1. Same material as pipe:
 - a. Molded or formed to suit pipe size and end design.
 - b. In required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.
- B. Trace Wire:
 - 1. Magnetic detectable conductor.
 - a. With clear plastic covering.
 - b. Imprinted with "Storm Drain" in large letters.

2.03 CATCH BASIN, CLEANOUT, AND AREA DRAIN COMPONENTS

- A. Catch Basin:
 - 1. Size and type as indicated.
 - 2. Materials and installation in accordance with manufacturer's specifications.
 - 3. Filter insert as indicated.
- B. Area Drain:
 - 1. Size and type in accordance with Drawings.
 - 2. Materials and installation in accordance with manufacturer's specifications.

2.04 BEDDING AND COVER MATERIALS

- A. Bedding and Cover:
 - 1. As specified in Section 31 0000.

PART 3 EXECUTION

3.01 TRENCHING

- A. Refer to Section 31 0000 for additional trenching requirements.
- B. Hand trim excavation for accurate placement of pipe to elevations indicated.
- C. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.02 INSTALLATION – PIPE

- A. Verify that trench cut is ready to receive Work and excavations, dimensions, and elevations are as indicated.

**PLAY STRUCTURE AND SHADE STRUCTURE INSTALLATION
FDR ELEMENTARY SCHOOL
LAWDALE ELEMENTARY SCHOOL DISTRICT**

- B. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet.
- C. Connect to building storm drainage system, foundation drainage system, and utility/municipal sewer system.
- D. Make connections through walls through sleeved openings, as provided.
- E. Install continuous trace wire 12 inches above top of pipe.
 - 1. Coordinate with Section 31 0000.

3.03 INSTALLATION – CATCH BASINS AND CLEANOUTS

- A. Form bottom of excavation clean and smooth to correct elevation.
- B. Form and place cast-in-place concrete base pad, with provision for sanitary sewer pipe end sections.
- C. Level top surface of base pad:
 - 1. Sleeve concrete shaft sections to receive storm sewer pipe sections.
- D. Establish elevations and pipe inverts for inlets and outlets as indicated.
- E. Mount lid and frame level in grout, secured to top cone section at elevation indicated.

3.04 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with SSPWC Standards, unless indicated or directed otherwise.

3.05 PROTECTION

- A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION 33 4200