TECHNICAL SPECIFICATIONS

SITE BARRIER REMOVAL PROJECT

AT

FULLERTON COLLEGE

321 E. Chapman Ave. Fullerton, CA 92832

NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT

1830 W Romneya Dr. Anaheim, CA 92801 714.808.4500



WW Project No. 21028.00

December 21, 2021

Contact: Bradley Mansfield, Project Manager WESTBERGWHITE, Inc. 14471 Chambers Road Tustin, CA 92780 Tel. (714) 508-1780, ext. 308

TECHNICAL SPECIFICATIONS

CAMPUS-WIDE SITE BARRIER REMOVAL PROJECT

AT

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321 E. Chaman Ave. Fullerton, CA 92832

North Orange County Community College District

1830 W Romneya Dr. Anaheim, CA 92801 <u>714.808.450</u>0

DSA Application No. 04-120839

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December 21, 2021

ARCHITECT

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- 01 2610 Construction Document Modification Procedures
- 01 2976 Progress Payment Procedures
- 01 3113 Project Coordination
- 01 3119 Project Meetings
- 01 3300 Submittal Procedures
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- 01 4200 References
- 01 4500 Quality Control
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- 01 5713 Temporary Erosion and Sedimentation Controls
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03 3000 Cast-in-Place Concrete

DIVISION 04 MASONRY

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05 5000 Metal Fabrications

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- 32 1100 Base Course
- 32 1313 Concrete Paving
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SUMMARY OF WORK

PART 1 GENERAL

1.01 PROJECT DESCRIPTION

- A. Project consists of voluntary Accessibility Improvements at various Site and Building locations on Fullerton College Campus, Fullerton, CA, for North Orange County Community College District as shown on Contract Documents prepared by WestbergWhite, Inc., Architects.
- B. Demolition Work Includes:
 - 1. Selective Site Demolition Work:
 - a. Consisting of removal of portions of existing site improvements to allow for relocation, replacement, or modifications.
 - 2. Selective Interior Demolition Work Consisting of:
 - a. Consisting of removal of portions of existing interior improvements to allow for relocation, replacement, or modifications.
 - 3. Protection of existing improvements to remain.
 - 4. Cleaning existing improvements to remain.
 - 5. Removal of items for performance of Work.
 - 6. Removal of salvageable items to be retained by Owner.
 - 7. Removing debris, waste materials, and equipment.
- C. New Construction:
 - 1. Consisting of modifications and new work, including, but not necessarily limited to following:
 - a. New metal handrails/railings and modifications to existing metal handrails to provide required adjustments.
 - b. New concrete walks, brick pavers and tile flooring at accessible P.O.T.
 - c. New contrasting warning stripe and or grooves at steps.
 - d. New signage, including directional signage.
 - e. New cmu pilaster.
- D. Site Improvement Work:
 - 1. Consisting of modifications and new work, including, but not necessarily limited to following:
 - a. Concrete work in path of travel consisting of removal and replacement of existing concrete paving.
 - b. Concrete brick paver work in path of travel consisting of removal and replacement of existing concrete & brick paving.
 - c. Tile work in path of travel consisting of removal and replacement of existing tile flooring.
 - d. New handrails and modification of existing handrails at stairs & ramps.
 - e. Painted contrasting color warning stripe and/or grooves at stair nosing's
 - f. Site directional signage.
 - g. Cmu pilaster with plaster finish.

1.01 PROCUREMENT AND CONTRACTING DOCUMENTS

A. Use Division 00 Procurement and Contracting Requirements provided by [Schools or College District] for [Name and Location of Project]

1.02 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.
 - 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.

1.03 CONSTRUCTION REQUIREMENTS

- A. Construct Work conforming to requirements of California Code of Regulations (CCR), Tile 24, Part 2, 2019 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.

1.04 CONTRACTS

A. Construct Work under single fixed-price contract.

1.05 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.

1.06 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 COLLEGE SESSIONS

- A. Work under this contract will be executed in part during regular sessions of School.
 1. Cooperate with College 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 College.
 - 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 College activities.

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)

ALTERNATES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Identification of each Alternate by number, and description of basic changes to be incorporated into Work, only when that Alternate is made part of Work by specific provisions in Owner-Contractor Agreement.
 - 2. This information will be repeated on Bid Form.
- B. Related Sections:
 - 1. Section 01 1100: Summary of Work; references to Divisions 00 and 01 Documents
- C. Related Requirements:
 - Refer to Division 00 Procurement and Contracting Documents for following:
 - a. Method of quotation of cost of each Alternate, and basis of Owner's acceptance of Alternates: Bidding Documents.
 - b. Incorporation of Alternates into Work: Owner-Contractor Agreement.
- C. Coordinate pertinent related work and modify surrounding Work as required to properly integrate Work under each Alternate, and to provide complete construction required by Contract Documents.
- **PART 2 PRODUCTS** (Not Applicable)
- PART 3 EXECUTION

1.

3.01 SCHEDULE OF ALTERNATES

- A. Alternate No. 1 New Concrete Paving at Healing Garden:
 - 1. Base Bid:
 - a. Leave new concrete walkways (sidewalks) as shown on Drawings.
 - 2. Deductive Alternate:
 - a. Omit new concrete walkways (sidewalks) where indicated on Drawings.
- B. Alternate No. 2 Pedestrian Ramp:
 - 1. Base Bid:
 - a. Leave new concrete pedestrian ramp as shown on Drawings.
 - 2. Deductive Alternate:
 - a. Omit new concrete pedestrian ramp where indicated on Drawings.

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 1 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.

- 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)

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:

2.

- 1. Section 01 2610: Construction Document Modification Procedures
 - 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.
 - 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.
 - 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)

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.
- D. Administrative Procedures:
 - 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
 - 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.

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.
 - 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.
- I. 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. Cordination 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.
 - I. Housekeeping.
 - m. Quality and Work standards.
 - n. Construction progress
 - o. Progress Schedule and Submittals.
 - 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)

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
- B. Related Sections:
 - 1. Section 01 3113: Project Coordination
 - 2. Section 01 3329: Sustainable Design Reporting/LEED Requirements
 - 3. Section 01 4100: Regulatory Requirements; submittals to regulatory agencies.
 - 4. Section 01 4200: References; submittals to regulatory agencies.
 - 5. Section 01 4500: Quality Control: inspection and testing submittals
 - 6. 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.
 - 10) Commissioning Requirements
 - 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.

- 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 addresss of:

- 1) Architect.
- 2) Contractor.
- 3) Subcontractor.
- 4) Supplier
- 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.
- g. 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, and when required with LEED Submittals.

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.

1.01 SAMPLES

- C. 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.
- D. 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
- E. 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.

1.02 VERIFIED REPORTS

C. 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.

1.03 MISCELLANEOUS SUBMITTALS – WORK RELATED

- C. 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.

1.04 CONTRACTOR RESPONSIBILITIES

- C. 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.

1.05 RESUBMITTAL REQUIREMENTS

- C. 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.
- D. Product Data and Samples:
 - 1. New data and samples, same as required for initial submittal.
- E. Multiple Resubmittals:
 - 1. Requirements cover initial submittal review and one resubmittal review when necessary.
 - 2. Architect's and/or Consultant's cost for evaluationg additional submittals requested by Contractor beyond first resubmittal will be paid by Owner with reimbursement from Contractor by deductive change order.

1.06 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- C. 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.
- D. Distribute samples that carry Architect's review stamps as directed by Architect.

1.07 ARCHITECT'S ACTION

- C. 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.

- D. 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.
 - b. Final-But-Restricted Release:
 - 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:
 - 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)

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:
 - a. California Code of Regulations (CCR):
 - b. Title 19 Public Safety, current edition.
 - c. Title 24, Part 1 2019 California Administrative Code
 - d. Title 24, Part 2 2019 California Building Code (CBC), Volumes 1 and 2.
 - e. Title 24, Part 3 2019 California Electrical Code (CEC).
- f. Title 24, Part 4 2019 California Mechanical Code (CMC)
- g. Title 24, Part 5 2019 California Plumbing Code (CPC).
- h. Title 24, Part 6 2019 California Energy Code
- i. Title 24, Part 9 2019 California Fire Code (CFC).
- j. Title 24, Part 10 2019 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)
- k. Title 24, Part 11 2019 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.

- 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)

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 Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
- C. Related Requirements:
 - 1. Inspections and testing required by laws, ordinances, rules, regulations or orders of public authorities: General Conditions.
 - 2. Certification of Products: Respective specification sections.
 - 3. Test, Adjust and Balance of Equipment: Respective specification sections.
 - 4. Tests and Standards: Each specification section listed.

1.02 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.

1.03 PROJECT INSPECTOR

A. Owner will select and employ Project Inspector

1.04 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.

1.05 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.

1.06 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. 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 shall not be incorporated in Project.

1.07 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: Promptly submit copies of reports of inspections and tests, mill analysis, concrete mix designs and certifications per applicable sections of specification.
 - 1. Submit one copy of test reports to:
 - a. Owner.

- b. Architect.
- c. Contractor.
- d. Project Inspector.
- 2. Include tests made, regardless of whether such tests indicate that material is satisfactory or unsatisfactory.
- 3. Report samples taken but not tested.
- 4. Report records of special sampling operations as required.
- 5. Show in report that material or materials were sampled and tested in accordance with requirements of Title 24 and with approved specifications.
- 6. 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: Written reports of each inspection, test, or similar service include, but are not limited to, following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making inspection or test.
 - 6. Designation of Work and test method.
 - 7. Identification of product and Specification Section.
 - 8. Complete inspection or test data.
 - 9. Test results and interpretation of test results.
 - 10. Ambient conditions at time of sample taking and testing.
 - 11. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. 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.

1.08 INSPECTION BY OWNER

- 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.
- B. 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.
- C. 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.

1.09 WORK BY OWNER'S PROJECT INSPECTOR

- A. Concrete slump tests.
- B. Concrete cylinder samples.

1.10 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: Coordinate sequence of activities to accommodate required services with minimum of delay.
 - 1. Coordinate activities to avoid necessity of removing and replacing construction to accommodate inspections and tests.
 - 2. Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

1.11 MISCELLANEOUS TESTS AND INSPECTIONS

- A. Soil and Compaction Testing and Inspection: Performed by Project Geotechnical (Soils) Engineer employed and paid by Owner.
- B. Special Tests: Special tests requested by Owner or Architect or DSA will be paid for by Owner, except that if 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. References:
 - 1. Chapters and Articles refer to California Code of Regulations (CCR), Title 24, Part 2, California Building Code (CBC), Volumes 1 and 2, current Edition.
 - 2. American Concrete Institute (ACI):
 - a. ACI 318 Building Code Requirements for Structural Concrete and Commentary, current edition.
- B. Required Test and Inspections:
 - 1. Following Tests and Inspections are required, as set forth in California Building Code and ACI 318 as referenced:
- C. Excavations, Foundations and Retaining Walls (Chapter 18A):
 - 1. Site Grading: 1804A.4
 - 2. Compacted Fill Material: 1804A.6
- D. Inspection (Chapter 17A):
 - 1. Site Soil and Backfill: 1705A.6 Table 1705A.6
- E. Concrete (Chapters 17A and 19A):
 - 1. Materials:
 - a. Portland Cement Tests: 1705A.3.2, 1910A.1
 - b. Concrete Aggregates: 1705A.3.2, 1903A.5
 - c. Reinforcing Bars: 1705A.3.2 1910A.2
 - 2. Concrete Quality:
 - a. Proportions of Concrete: 1910A.1, and ACI 318 Section 26.4.3
 - b. Strength Tests of Concrete: 1705A.3 Table 1705A.3, Item 6, 905A.1.16, and ACI 318 Section 26.12 as modified.
 - c. Mixing: 1903A, 1904A.
 - 3. Concrete Inspection:
 - a. Batch Plant: 1705A.3.3
 - b. Waiver of Batch Plant: 1705A.3.3.1
 - c. Preplacement and Placing 1705A.3.5, 1705A.3.6
 - d. Reinforcing Bar Welding: 1705A.3.1 Table 1705A.3, Item 2 and Table 1705A.2.1, Item 5b; 1903A.8.

END OF SECTION 01 4500

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SECTION 01 5000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.

1.01 SUMMARY

- A. Section Includes:
 - 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 informational signs.
- B. Related Sections:

2.

- 1. Section 01 5713: Temporary Erosion and Sedimentation Controls
 - Section 02 4113: Selective Site Demolition; additional protection requirements.
- 3. Section 02 4120: Selective Interior Demolition
- 4. Section 31 0000: Earthwork
- 5. 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 32 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.

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- 2. Provide and pay for water needed for construction.
- 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.

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. 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.
 - 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 Responsiblility:
 - 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.
 - 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:
 - 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.
 - 1. 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

1.

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

SECTION 01 5713

TEMPORARY EROSION AND SEDIMENTATION 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 noncompliance by Contractor.
- B. Related Sections:
 - 1. Section 02 4113: Selective Site Demolition; removal of hardscape.
 - Section 31 0000: Earthwork; temporary and permanent grade changes for erosion control.
 - 3. Section 31 1000: Site Clearing; limits on clearing; disposition of vegetative clearing debris.

1.02 REFERENCES

2.

- 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.:
 - 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 2017 Construction General Permit (CGP).
- B. Comply with requirements of California State Construction General Permit Order 2009-0009-DWQ for erosion and sedimentation control, even though this Project is not required by law to comply.

- C. Best Management Practices Standard:
 - 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. Erosion and Sedimentation Control Plan and Stormwater Pollution Prevention Plan (SWPPP):
 - 1. Include:
 - a. Site plan:
 - 1) Identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
 - 2) Showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
 - b. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
 - c. Schedule of temporary preventive measures, in relation to ground disturbing activities.
 - d. Other information required by law.
 - e. Format required by law is acceptable, provided additional information specified is also included.
 - 2. Obtain approval of Plan by authorities having jurisdiction.
 - 3. Obtain approval of Plan by Owner.
- B. 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.
- C. 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

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 32 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.
- 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.

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- 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.
 - 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.

- 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 evaluationg 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:
 - 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:
 - Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce list of manufacturers' names, provide product by one of manufacturers listed that complies with requirements.
 - 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:
 - 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.
 - 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.
 - 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.
 - 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

SITE BARRIER REMOVAL PROJECT FULLERTON COMMUNITY COLLEGE NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT
Substitution Request Form

Project:		Substitution Request Number:		
To: Re:		te:		
		E Project Nu	mber:	
		ntract For: _		
Specification Title:				
Section: Page:	Art	icle/Paragra	iph:	
Requested Substitution:				
Manufacturer: A	ddress:		Phone No	
Trade Name:			Model No.:	
Installer:A	ddress		Phone No.:	
History: □ New Product □ 2-5 y Differences between requested substitut	rs. old ion and spec	□ 5-10 yr cified produc	s. old □ More than t:	10 yrs. old
Provide Point-by-Point Itemized Compar data attached REQUIRED BY A/E – Comply with Divis Reason for not providing specified item:	ion 01 Speci	ification Sec	tion 01 6000.	
Similar Installation:				
Project:		Arch	itect:	
Address:		Own	er:	
		Date	e Installed:	
Proposed substitution affects other parts	of Work:	□ No	□ Yes; explain	
Benefit to Owner for accepting substitution	on:		(\$)
Proposed substitution changes Contract	Time: □ No	□ Yes;	Add/Deduct	days.
Supporting Data Attached (Comply with	Division 01 S	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:	
Attachmenls:	

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.

- 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

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 5000:	Temporary Facilities and Controls; temporary protections.
3.	Section 01 7419:	Construction Waste Management and Disposal
4.	Section 01 7423:	Cleaning
5.	Section 02 4113:	Selective Site Demolition; cutting and patching of existing hardscape.
6.	Section 02 4120:	Selective Interior Demolition; additional cutting and patching of interior work.

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.

- 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 Architect 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. Čut 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

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.

- 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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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 ConstructionDemolitionMaintenance/Alteration Projects
PROJECT SIZE (SQ.FT.):
DATE AND ESTIMATED PERIOD

EXHIBIT 1 FORM

(1) Material Type	(2) Tons Estimated Recycle	(3) Tons Estimated Reuse	(4) Tons Estimated Salvage	(5) Tons Estimated Landfill	(6) Proposed Disposal or Recycling Facility
Total					
Diversion Rate: (Columns[(2)+(3)	+(4)] / [(2)+(3)+(4	4)+(5)	=	
Signature	-	Title		Date	

Column 1: "Material Type" – Enter type of materials targeted for recycling, reuse, or requiring disposal.

Columns 2 through 4: "Estimated Generation" – Enter estimated quantities (tons) of recyclable, reusable, or salvageable waste materials anticipated to be generated and state number of salvageable items.

Column 5: "Estimated Landfill" - Enter quantities (tons) of materials to be disposed in landfill.

- Column 6: "Disposal Location" Enter end-destination of recycled, salvaged, and disposed materials.
- General: (1) Attach proposed Recycling and Waste Bin Location Plan.
 - (2) Attach name and contact data for each recycling or disposal destination to be used.

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 ConstructionDemolitionMaintenance/Alteration Projects			
PROJECT SIZE (SQ.FT.):			
DATE AND ESTIMATED PERIOD:			

EXHIBIT 2 FORM

(1) Material Type	(2) Tons Actual Recycle	(3) Tons Actual Reuse	(4) Tons Actual Salvage	(5) Tons Actual Landfill Name	(6) Disposal or Recycling Facility (e.g. Onsite, of Facility)
Total					
Diversion Rate:	Columns[(2)+(3)	+(4)] / [(2)+(3)+(4	4)+(5)	=	
Signature	-	Title		Date	

- Column 1: "Material Type" Enter type of materials targeted for recycling, reuse, or requiring disposal.
- Columns 2 through 4: "Estimated Generation" Enter estimated quantities (tons) of recyclable, reusable, or salvageable waste materials anticipated to be generated and state number of salvageable items.
- Column 5: "Estimated Landfill" Enter quantities (tons) of materials to be disposed in landfill.
- Column 6: "Disposal Location" Enter end-destination of recycled, salvaged, and disposed materials.
- General: (1) Attach proposed Recycling and Waste Bin Location Plan.
 - (2) Attach name and contact data for each recycling or disposal destination to be used.

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:

RECY	CLING C	COMPANY	OR DISPOSAL	-
SITE:				

SUBMITTED BY:_____

PHONE NUMBER:_____

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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 Bart Doering, Facilities Development Director, at 951.222.8962.

EXHIBIT 4 FORM

Г

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.
 - 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:
 - 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 eventextured 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.
 - 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 32.

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.
 - 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.

- 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.
 - 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.
 - 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

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.

- 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, Pluming, 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.

1.03 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.
 - 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 date 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.

1.04 RECORD DOCUMENT STORAGE

A. Binders:

2.

- 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.
 - 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 not withstanding, 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.

- 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

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WARRANTY/GUARANTEE FORM

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 Licen	se No.	State License No.:
	Local Representative: For maintenance		ance, repair, or replacement service, contact:
	Name:		
	Address:		
	Phone:		

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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

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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**. Site Demolition Work includes removal of portions of following to allow for relocation, replacement, or modifications:
 - a. Concrete work in path of travel consisting of removal of existing concrete paving and curbs.
 - b. Metal handrails
 - c. Existing site signage where indicated.
 - d. Existing fence gate, frames, and gate hardware.
 - e. Existing lawn irrigation heads and piping as indicated on drawings.
- 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 5723: Temporary Erosion and Sediment Control.
 - 4. Section 01 7419: Construction Waste Management and Disposal.
 - 5. Section 02 4120: Selective Interior Demolition
 - 6. Section 31 0000: Earthwork
 - 7. Section 31 1000: Site Clearing; removal of organic materials.
 - 8. Section 32 0117: Asphalt Paving Repair; cold milling of asphalt paving.
 - 9. Section 32 1313: Concrete Paving
- C. Related Requirements:
 - 1. Asphalt paving work in path of travel consisting of cold milling of existing asphalt paving and asphalt overlay is specified in Section 32 0117.

1.02 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate extent of items and systems to be removed.
 - 2. Indicate items to be salvaged or items to be protected during demolition.
 - 3. 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 utilites 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. Items Scheduled for Salvage by Owner:
 - 1. Clean, package and label items for storage.
 - 2. Deliver to location designated by Owner's authorized representative.
- B. Items Scheduled for Reuse:
 - 1. Store items on Project Site and protect from damage, theft, and other deleterious conditions.

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.
 - 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.
- D. Remove existing metal railings to extent indicated to allow for proposed handrail replacement or modifications.
- E. Remove existing fence gate, frame, and hardware.
 - 1. Retain gate hardware for reinstallation on new gate.

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 CONCRETE PAVING AND ASPHALT (BITUMINOUS) SURFACING REMOVAL

- A. Break up and completely remove existing concrete paving, curbs, gutters, and walks to indicated limits.
 - 1. Perform cutting to neat and even line with proper tools or concrete cutting saw.
 - 2. Remove concrete broken beyond indicated limits to nearest joint or score line and replace with new concrete to match existing.
 - 3. Remove existing asphalt (bituminous) surfacing by cold milling specified in Section 32 0117.
 - a. Minimum Depth of Cut:
 - 1) 1-1/2 inches, unless otherwise indicated.

3.05 REMOVAL OF EXISTING FENCING

- A. Remove existing fencing as indicated that is not to be reused..
 - 1. Deliver fencing, including hardware items, as salvage to location as directed by Owner.
 - 2. Completely remove fencing, including concrete footings where occurring.

3.06 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.

3.07 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.

3.08 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.

3.09 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 03 0130

RESURFACING OF CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Concrete Resurfacing (Broom Finish) System for resurfacing of existing exterior concrete stairs.
 - a. Work includes application of contrasting striping on stair treads
- B. 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.
 - 1. Chapter 11B Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.
- B. International Concrete Repair Institute (ICRI):
 - 1. ICRI Guideline No. 310.2R Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays

1.03 SYSTEM DESCRIPTION

- A. Concrete Resurfacing (Broom Finish) System:
 - 1. Broom textured cementitious overlayment system bonded directly to properly prepared concrete.

1.04 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's technical data sheets for each product used as part of system.
 - 2. Include manufacturer's instructions for handling, storing, and applying each coating material proposed for use.
 - 3. Certification by manufacturer that products supplied comply with local regulations controlling use of Volatile Organic Compounds (VOC).
 - a. Furnish through installer, to Contractor, material manufacturer's, current Safety Data Sheets (SDS), complying with current state, providence, federal government requirements.
 - b. Do not submit SDS to Architect.
- B. Maintenance Literature:
 - 1. Copy of the material manufacturer's recommended care and maintenance procedures.

- C. Samples:
 - 1. Minimum of four samples, minimum 6 inches by 6 inches for each color specified for contrasting striping.
 - a. Clearly label samples.
 - b. Provide in-place, first installed sample of broom finish for compliance with CBC, Chapter 11B.

1.05 QUALITY ASSURANCE

- A. Provide materials that comply with following:
 - 1. Meet or exceed specified minimum or maximum physical and mechanical properties.
 - 2. Materials manufactured by single manufacturer.
 - 3. Material manufacturer's Application Instructions, clearly stating that submitted products meet specified requirements
- B. Installer requirements:
 - 1. Furnish written endorsement from manufacturer stating that they are qualified to install specified materials.
 - 2. Submit letter from material manufacturer, signed by officer of company, stating that installer is in good financial standing with material manufacturer.
 - 3. Furnish detailed list of projects of similar magnitude to project specified that they have completed in last three years.
 - a. Package to include list of specific contacts with job titles, addresses, and phone number of contacts
 - 4. Perform Work in accordance with material manufacturer's Application Instructions.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project Site in unopened, undamaged containers, properly labeled by manufacturer, including following:
 - 1. Manufacturer's Name and Address.
 - 2. Product Name and Number.
 - 3. Component Reference.
 - 4. Mix Ratio (when applicable).
 - 5. CHEMTREC Emergency Response Information.
 - 6. Lot or Batch Number(s).
- B. Storage of Materials:
 - 1. Store materials in covered area, out of elements, including direct sunlight, that is clean, dry, and heated (when required) and maintained between 60 degrees F and 90 degrees F.
- C. Handling of Material:
 - 1. Only by approved installer, in accordance with industry standards and compliance with SDS requirements.

1.07 PROJECT CONDITIONS

- A. Existing Portland cement concrete:
 - 1. Core to determine that it was placed in accordance with ACI 302.2R on adequate positive side moisture barrier.

- 2. Where it has not, existing concrete surface may require positive side moisture mitigation primer.
- B. Project Access:
 - 1. Provide installer with free and unencumbered access to areas deemed necessary by installer in order to execute Work in accordance with this Specification.
 - 2. Grant material manufacturer free and unencumbered access to observe substrate prior to installation, during installation and after installation.

1.08 WARRANTY

A. Manufacturer guarantees that products are free from manufacturing defects and comply with their published specification.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Manufacturer:
 - 1. Basis-of-Design: Design of Concrete Resurfacing (Broom Finish) System is based on products as manufactured by Super-Krete Products, division of Arizona Polymer Flooring, Inc., Phoenix, AZ
- B. Subject to compliance with specified requirements, comparable products may be submitted by alternate manufacturers in accordance with requirements for product substitutions specified in Division 01 and following:
 - 1. Submit items listed in Article 1.04 for evaluation of proposed system.
 - 2. Copy of manufacturer's material warranty.
- C. Concrete Resurfacing (Broom Finish) System:
 - 1. Providing skid-resistant, cooler walking surface.
 - 2. Super-Krete S-9300 Bond-Kote Gray coated and protected with impervious clear sealer.
 - a. Chemical and wear resistant.
 - 3. Physical Properties:

Typical Physical Properties – 7 days at 75 degrees F				
1.	Compressive Yield Strength	6,500 psi		
2.	Bond Strength	235 psi		
3.	Specific Gravity	3.15		
4.	Volatile Organic Compound (VOC)	0 percent		

- 4. Mix components in accordance with material manufacturer's recommendations.
- D. Concrete Treatment:
 - 1. Concrete Hardener, Densifier, Moisture Vapor Reducer:
 - Moisture vapor reduction and chemical encapsulation treatment consisting of combination of S-1300 Pene-Krete and S-3900 Bond-Kote Gray
- E. Toppings:
 - 1. Super-Krete S-9300 Bond-Kote Gray topping as based upon specified finished appearance.

- 2. Topping is single-component, ready-mix material for mixing quality control.
- F. Water for Mixing:
 - 1. Clean, potable, not exceeding 70 degrees F.
- G. Contrasting Striping On Stair Treads:
 - 1. 100 percent solids, two component, aliphatic polyurea/polyaspartic hybrid.
 - 2. Low viscosity, solvent free, providing very high gloss finish that is both hard and abrasion resistant.
 - 3. Incorporate UV stabilizer package for exterior applications to ensure long-term gloss retention and resistance to yellowing.
 - 4. Product: Super-Krete SK-PS100

3.01 EXAMINATION

- A. Examine areas to receive Concrete Resurfacing (Broom Finish) System:
 - 1. Correct pre-existing defects in concrete substrate.
 - 2. Resolve deviation from concrete part of this Specification prior to placement of Concrete Resurfacing(Broom Finish) System.
 - 3. Where concrete substrate is found to be in non-conformance with substrate specification, correct non-conforming substrate prior to placement of Concrete Resurfacing (Broom Finish) System.
 - 4. Do not start installation until defects have been corrected.

3.02 PREPARATION

- A. Substrate:
 - 1. Prepare substrate to receive Concrete Resurfacing (Broom Finish) System in accordance with manufacturer's recommendation and Application Instructions.
- B. Surface Cleaning:
 - 1. Surface Cleaning System: Super-Krete S-12000 Heavy Duty Degreaser.
 - 2. Application is required to ensure maximum chemical reaction within pores of concrete.
 - a. Required pH of Product: 11.5.
- C. Crack Treatment:
 - 1. Address cracks prior to installation.
 - 2. Refer to material manufacturer's Crack Repair Guide.
- D. Placing Concrete Resurfacing (Broom Finish) System:
 - 1. Mix and place per manufacturer's Application Instructions.
 - 2. Inspect and accept Work or prepare punch list of corrections to issued to installer by Contractor as accepted by Architect.

3.03 CURE AND PROTECTION:

A. Protect Concrete Resurfacing (Broom Finish) System from damage from other work in accordance with material manufacturer's recommendations.

3.04 CLEANING

- A. Clean Concrete Resurfacing (Broom Finish) System in accordance with material manufacturer's recommendation using Super-Krete S-200 Super-Scrub and clean water.
- B. Do not use cleaners that are not recommended by material manufacturer as they may have deleterious effect on appearance (color, gloss, and so on) or they may affect performance (softening, loss of texture, and so on).

END OF SECTION 03 0130

SECTION 03 3000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Formwork for cast-in-place concrete and installation of embedded items.
 - 2. Reinforcing steel for concrete unless specifically noted otherwise.
 - 3. Reinforced concrete with compressive strengths as shown.
 - 4. Concrete Finishing:
 - 5. Concrete sealers.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 01 4500: Quality Control
 - 3. Section 07 9200: Joint Sealants
 - 4. Section 31 0000: Earthwork
 - 5. Section 32 1313: Concrete Paving; walks, curbs, and driveways.
- C. Products Installed But Not Furnished Under This Section:
 - 1. Built-in anchors, inserts, bolts and other embedded items for connection of other Work.

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 19A Concrete
- B. ASTM International (ASTM):
 - 1. ASTM A 615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
 - 2. ASTM A 706 Standard Specification for Deformed and Plain Low-Alloy 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 C 33 Standard Specification for Concrete Aggregates
 - 5. ASTM C 42 Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams
 - 6. ASTM C 88 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
 - 7. ASTM C 94 Standard Specification for Ready-Mixed Concrete
 - 8. ASTM C 143 Standard Test Method for Slump of Hydraulic-Cement Concrete
 - 9. ASTM C150 Standard Specification for Portland Cement
 - 10. ASTM C 171 Standard Specification for Sheet Materials for Curing Concrete
 - 11. ASTM C 595 Standard Specification for Blended Hydraulic Cements
 - 12. ASTM C 685 Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing

- ASTM D 1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- ASTM D 1752 Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
- C. American Concrete Institute (ACI):
 - 1. ACI 117 Specification for Tolerances for Concrete Construction and Materials (ACI 117-10) and Commentary-Reapproved 2015
 - 2. ACI 301 Specification for Structural Concrete for Buildings.
 - 3. ACI 302.1R Guide to Concrete Floor and Slab Construction
 - 4. ACI 302.2R Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
 - 5. ACI 304 Recommended Practice for Measuring, Mixing and Placing Concrete.
 - 6. ACI 305 Recommended Practice for Hot Weather Concreting.
 - 7. ACI 306 Recommended Practice for Cold Weather Concreting.
 - 8. ACI 318 Building Code Requirements for Reinforced Concrete.
 - 9. ACI 347 Recommended Practice for Concrete Formwork
- D. California Department of Transportation (Caltrans):
 - 1. Office of Materials Engineering and Testing Services:
 - a. California Test Methods (CTM):
 - 1) CTM 217 Method of Test for Sand Equivalent.
 - 2) CTM 227 Method of Test for Evaluating Cleanness of Coarse Aggregate
- E. The Engineered Wood Association (APA):
 - 1. Voluntary Product Standard Structural Plywood (PS 1-09)
 - 2. Guide to Plywood Grades
- F. West Coast Lumber Inspection Bureau (WCLIB):
 - 1. Standard Grading Rules No. 17, current edition.
- G. American Welding Society (AWS):
 - 1. AWS D1.4 Structural Welding Code Reinforcing Steel.
 - 2. AWS D1.8 Seismic Welding Supplement.
- G. South Coast Air Quality Management District (SCAQMD):
 1. Rule 1113 Architectural Coatings

1.03 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's product data with installation instructions for proprietary materials including reinforcement and forming accessories, form coatings, admixtures, joint materials, sealers/hardeners, curing materials (when permitted), and others as requested by Architect.
- B. Mix Designs:
 - 1. Prepare mix designs for Architect's review and include following information in mix design data:

- a. Design:
 - 1) Project name, address, Site location, and location of design usage.
 - 2) Contractor, Sub-Contractor, Supplier and Plant Location.
 - 3) Mix Number.
 - 4) Specified compressive strength, maximum aggregate size, slump, and placement method.
 - 5) Application and location in structure.
 - 6) Signature and stamp of licensed civil engineer responsible for mix design.
- 2. Materials:
 - a. Design Method.
 - b. Water-Cement Ratio.
 - c. Cement:
 - 1) Type, amount, and compliance with specified criteria statement.
 - d. Aggregates:
 - 1) Source(s), gradations (Individual and combined).
 - e. Admixtures:
 - 1) Brand, classification, dosage, addition method.
 - 2) Obtain specified approvals for admixtures prior to including in mix designs.
 - f. Water source.
 - g. Test Results, Batch Quantities, Yield (calculations).
- 3. Special Considerations:
 - a. Unit Weight.
 - b. Other considerations relative to placement, curing, finish, and testing.
- C. Shop Drawings:
 - 1. Cast-in-place Concrete:
 - a. Show construction joint locations and details.
 - 2. Reinforcing Steel:
 - a. No submittals are required.
 - b. Providing steel reinforcing as indicated on Drawings and as specified herein is responsibility of Contractor.
 - c. Prepared Shop Drawings are solely for use by Contractor and will not be reviewed or approved by Architect or Structural Engineer.
- D. Batch Plant Certificates:
 - 1. Accompany each load of materials or concrete with signed copy of batch plant certificate stating quantity of each material, amount of water, admixtures, departure time and date.
 - 2. When continuous batch plant inspection is waived, provide affidavit in accordance with Title 24, CBC, Part 2, Section 1704A.3.3 to Owner's Testing Laboratory.
- E. Testing and Inspection Reports:
 - 1. Owner's Testing Agency:
 - a. Laboratory Reports:
 - 1) Laboratory test or evaluation reports for concrete materials and mix designs, performed in accordance with Section 01 4500, to Owner, Architect, Contractor, and Division of the State Architect.
 - 2) Do not begin concrete production until mix designs have been reviewed and accepted by Architect.

- 2. Reinforcing Steel Reports:
 - a. Certified mill test reports (tensile and bending) for each heat or melt of steel prior to delivery of material to Project Site.
 - b. Where reinforcing is to be welded, furnish mill test reports verifying weldability of steel.
- F. Contractor's Certifications:
 - 1. Testing Laboratory's Certificate of Compliance.
 - 2. Certified copies of mix designs for each concrete class specified including compressive strength test reports.
 - 3. Certification that materials meet requirements specified.
 - 4. Certification from vendor that samples originate from and are representative of each lot proposed for use.
- G. Schedule of placing for Architect's review before starting Work.
- H. Samples:
 - 1. Upon request of Architect
 - a. Furnish formwork and accessories, including expansion joint.
 - b. Concrete sealer/harder products as required for application to mock-up slab panels.

1.04 QUALITY ASSURANCE

- A. Formwork and Accessories:
 - 1. Design Criteria: Formwork conforming to ACI 347.
 - a. Design Formwork to:
 - 1) Prevent leakage or washing out of cement mortar.
 - 2) Resist spread, shifting, and settling.
 - 3) Reproduce accurately required lines, grades, and surfaces within tolerances specified.
 - b. Safety:
 - 1) Responsibility for adequate strength and safety of formwork including falsework, and shoring rests with Contractor.
 - 2. Allowable Tolerances:
 - a. Construct Formwork to produce concrete within tolerance limits recommended in ACI 347, unless otherwise noted.
- B. Reinforcing:
 - 1. Welders' Qualifications:
 - a. Qualify welders in accordance with AWS D1.4 and AWS D1.
 - 2. Do not permit reinforcing steel to rust where there is danger of staining exposed surfaces of adjacent concrete.
 - a. Replace rust-stained concrete at Contractor's expense.
 - 3. Allowable Tolerances:
 - a. Place reinforcing steel within tolerances permitted by ACI 318, Section 26.6.2, unless otherwise approved by Architect.
 - 4. Owner's Testing Agency will provide tests in accordance with CBC Chapter 17A.
 - a. Collect mill test reports for reinforcement.
 - b. Take samples from bundles at fabricators.

- 1) When bundles are identified by heat number and accompanied by mill analysis, take two specimens from each ten tons, or fraction thereof, of each size and grade.
- 2) When reinforcement is not positively identified by heat numbers or when random sampling is intended, take two specimens from each 2 tons, or fraction thereof, of each size and grade.
- 5. Test for Tensile and Bending Strengths:
 - a. Provide inspection of welding, including prior fit-up, welding equipment, weld quality and welder certification in accordance with AWS D1.4 and AWS D1.8
 - b. Perform chemical analysis sufficient to determine carbon equivalent and minimum preheat temperature when reinforcement does not conform to low-alloy steel requirements of CBC Section 1903A.8.
- C. Concrete:
 - 1. Testing Laboratory Qualifications:
 - a. Testing Laboratory under direction of registered Civil Engineer licensed in State of California, having operated successfully for four years prior to this Work, conforming to requirements of ASTM E 329.
 - 2. Requirements of ACI 301 govern Work, materials, and equipment related to this Section.
 - a. Specifications set minimum results required, and references to procedures are intended to establish minimal guides.
 - 3. Responsibility for quality of concrete in place rests with Contractor who also bears burden of proof that concrete meets minimum requirements.
 - 4. Placing of concrete by means of pumping will be acceptable method of placement providing that Contractor can demonstrate that:
 - a. Specified concrete strengths will be met.
 - b. Equipment has record of satisfactory performance under similar conditions and using similar mix.
 - c. Trial batches have been made.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General:
 - 1. Ensure storage facilities are weather tight and dry.
 - 2. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use.
- B. Reinforcing:
 - 1. Deliver reinforcement and accessories to Project Site not more than 48 hours before placement.
 - 2. Store in manner to prevent excessive rusting and fouling with grease, dirt, or other bond-weakening coatings.
 - 3. Take precautions to maintain identification after bundles are broken.
- C. Cast-in-Place Concrete:
 - 1. Store bulk cement in bins capable of preventing exposure to moisture.
 - 2. Use sacked cement in chronological order of delivery.
 - a. Store each shipment so that it may be readily distinguishable from other shipments.

1.06 PROJECT CONDITIONS

- A. Sequencing Schedule for Formwork:
 - 1. Ensure timely delivery of embedded items.
 - 2. Be responsible for cutting and patching necessitated by failure to place embedded items.
 - 3. Plan erection and removal to permit proper sequence of concrete placing without damage to concrete.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Formwork and Accessories:
 - 1. Forming Materials:
 - a. Panel or board forms at Contractor's option.
 - 1) Panel Forms:
 - a) Minimum 5/8 inch thick exterior grade plywood with sealed edges, PS 1 grade Plyform Class I and II B-B Exterior or HDO Exterior.
 - 2. Wood Framing:
 - a. WCLIB standard grade or better Douglas Fir.
 - 3. Form Ties and Spreaders:
 - a. Metal type acting as spreaders, leaving no metal within one inch of concrete face and no fractures, spalls, depressions or other surface disfigurations greater than 3/4 inch in diameter.
 - 4. Expansion Joint Filler:
 - a. Fiber Type:
 - 1) Premolded non-extruding preformed bituminous saturated fiberboard units, ASTM D 1751, 1/4 inch thick unless otherwise noted.
 - 2) Provide one of following, or approved equal:
 - a) W. R. Meadows, Inc. Sealtight Fibre Expansion Joint (Basisof-Design)
 - b) J.D. Russell Company Fiberflex Fiber Expansion Joint
 - c) Right / Pointe Company Fibre Expansion Joint
 - d) SpecChem Fiber Expansion Joint
 - b. Cork Type:
 - 1) Preformed cork, ASTM D1752, Type II, 1/2-inch size unless otherwise noted.
 - a) Right / Pointe Company Cork-Standard Expansion Joint, or approved equal.
 - 5. Form Release Agent:
 - a. Must not stain or otherwise adversely affect architectural concrete surfaces.
 - b. Provide one of following, or approved equal:
 - 1) Atlas Construction Supply, Inc. Atlas Premium Gold Release
 - 2) Nox-Crete Co. Nox-Crete Form Coating
 - 3) Right / Pointe Company Right Release Water Base
- B. Reinforcing:
 - 1. Bars:
 - a. New billet steel, ASTM A615 Grade 60, and ASTM A706.

- 1) Grade 60, where welded.
- 2) Refer to Structural Drawings for use of Grade 40 bars.
- 2. Tie Wires and Spirals: ASTM A 1064.
- 3. Bar Supports:
 - a. As required for assembling and supporting reinforcement in place.
 - b. Typical: CRSI Class B, pregalvanized.
 - c. Concrete adobes for foundations and slabs on grade.
- 4. Threaded Coupler:
 - a. Lenton Standard coupler by ERICO, or approved equal.
 - b. Coupler is to develop 125 percent of specified yield strength reinforcement.
- 5. Welded Wire Fabric:
 - a. Conforming to ASTM A 1064
 - b. Fabricated from as-drawn steel wire into flat sheets.
 - c. For use with concrete stair fill only.
- C. Concrete:
 - 1. General Requirements:
 - a. Furnish cement and aggregates with proven history of successful use with one another.
 - Sources of cement and aggregate are to remain unchanged throughout Work, unless Architect approves request for change made at least 10 days prior to anticipated date of casting.
 - b. Ready-mixed concrete meeting requirements of ASTM C 94.
 - c. Deviations in properties of materials tested by Owner's Testing Agency is cause for their rejection pending additional test results and redesign of mix by Contractor's Testing Laboratory.
 - d. Use of frozen aggregates is not permitted.
 - 2. Cement:
 - a. Conforming to ASTM C150, Type II / V, low alkali.
 - b. Use one brand of cement throughout Project, unless otherwise acceptable to Architect.
 - 3. Aggregates:
 - a. Conform to Chapter 19A, Concrete, CCR, Title 24, Part 2 CBC Sections 1705A.3.2, 1903A.5, and following:
 - b. Coarse Aggregate:
 - 1) Conforming to ASTM C 33.
 - 2) Consisting of clean, hard, fine grained, sound crushed rock, or washed gravel, or combination of both.
 - 3) Free from oil, organic matter or other deleterious substances and not contain more than two percent by weight of shale or cherty material.
 - c. Fines:
 - 1) Conforming to ASTM C 33.
 - 2) Sand Equivalent:
 - a) Not less than 75 when tested per ASTM D 2419.
 - d. Provide aggregates from single source for exposed concrete.
- D. Water:
 - 1. Clean and potable, free from impurities detrimental to concrete.

- E. Admixtures:
 - 1. Use of admixtures is not permitted unless request is submitted to Architect and Structural Engineer for review and Structural Engineer's approval.
 - 2. Use of calcium chloride or admixtures containing calcium chloride is prohibited.
 - 3. Upon receipt of Structural Engineer approval, Contractor modifies mix designs as necessary, and submits modifications to Owner's Testing Agency for testing and acceptance
 - 4. When approved, following types of admixtures may be used, conforming to manufacturer's recommendations for use:
 - a. Water Reducing: Conforming to ASTM C 494, Type A.
 - b. Accelerating or Retarding: Conforming to ASTM C 494
 - c. Air Entraining: Conforming to ASTM C 260.
 - 5. Do not use admixtures which have not been incorporated and tested in accepted mix designs.
- F. Fly Ash:

1.

- 1. Fly ash conforming to ASTM C 618, Class N or F may be used at Contractor's option.
 - a. Use of Class C is not permitted.
- 2. Do not substitute more than 15 percent by weight of fly ash or other pozzolan, for ASTM C 150, Portland Cement.
- G. Non-Shrink, Non-Metallic Grout:
 - Premixed high strength grout requiring only addition of water at Project Site.
 - a. BASF Corporation, Construction Chemicals MasterFlow 928
 - b. Five Star Products, Inc. Five Star Grout.
 - c. Sika Corporation SikaGrout 428 FS
- H. Curing Materials:
 - 1. Concrete Curing Paper:
 - a. Conforming to ASTM C 171, non-staining, reinforced type.
 - 1) Orange Label Sisalkraft by Fortifiber Building Systems Group.
 - 2) Approved equal.
 - 2. Liquid Curing Compound:
 - a. Conforming to ASTM C 309, Type 1, Class B, approved standard product resin type.
 - 1) Deliver in unopened labeled containers.
 - 2) Water based acrylic polymer blend, free of wax or oil, compatible with subsequent applied finishes or floor coverings.
 - 3) Do not apply curing compounds in areas designated to receive floor coverings.
- I. Joint Sealing Compound:
 - 1. Refer to Section 07 9200.

2.02 SOURCE QUALITY CONTROL

- A. Furnish Plywood bearing APA grade-trademark.
- B. Owner's Testing Agency will:
 - 1. Review mix designs, certificates of compliance, and samples of materials Contractor proposes to use.

- 2. Test and inspect materials, as necessary, in accordance with ACI 318 and CBC Sections 1705A, 1903A, and 1910A for compliance with requirements.
- 3. Take samples as required from Contractor's designated sources.
- 4. Take one grab sample for each 100 tons of Portland cement except that, when used in bulk loading ready-mix plants where separate bins for pretested cement are not available, take grab samples for each shipment of cement placed in bin with not less than one sample being taken for each day's pour and subsequently test such samples when required by Architect who may be so advised by DSA.
- 5. Test coarse, intermediate, and fine aggregate by use of solution of sodium or magnesium sulfate, or both whenever in judgment of Architect such tests are necessary to determine quality of material.
 - a. Perform such tests in accordance with ASTM C 88.
 - b. Loss not to exceed 6 percent of either fine intermediate or coarse aggregate.
 - c. Aggregate failing to comply with this requirement may be used in Work provided it contains less than 2 percent of shale and other deleterious particles and shows loss in soundness test of not more than 10 percent when tested in sodium sulphate solution.
 - d. Test aggregates as required by CBC Sections 1705A.3.2 and 1903A.5.
- 6. Test for sand equivalent of fine aggregate in accordance with California Test 217.
- 7. Test for cleanness value of coarse and intermediate aggregate in accordance with California Test 227.
- 8. Inspect plant prior to starting Work to verify following:
 - a. Plant is equipped with approved metering devices for determining moisture content of fine aggregate.
 - b. Other plant quality controls are adequate.
- 9. Continuously inspect quality and quantity of materials used in transit mixed concrete, in batched aggregates and ready-mixed concrete at mixing plant or other location per CBC Sections 1705A.3, 1905A.1.16, 1910A.1, and ACI 318 Section 26.12 as modified, where other materials are measured.
- C. Waiver of Batch Plant Inspection:
 - 1. Continuous batch plant inspection may be waived in accordance with CBC Section 1705A.3.3.1
 - 2. Following requirements apply when batch plant inspection is waived:
 - a. Qualified technician of Testing Agency to perform check of first batch at start of day.
 - b. Licensed weighmaster to positively identify materials as to quantity and certify to each load by batch ticket.
 - c. Batch tickets, including material quantities and weights, are to:
 - 1) Accompany load
 - 2) Be transmitted to Project Inspector by truck driver with load identified thereon.
 - 3) Do not place load without batch ticket identifying mix.
 - 4) Inspector will keep daily record of placements, identifying each truck, its load, time of receipt, and approximate location of deposit in structure, and will transmit copy of daily record to enforcement agency.

2.03 MIXES

- A. General Requirements:
 - 1. Perform tests or assemble necessary data indicating conformance with Specifications.
 - 2. For each mix submit data showing that proposed mix will attain required strength in accordance with requirements of CBC Sections 1705A.3 and 1905A.1.16 per ACI 318 Section 26.12.2 (a) as modified
 - 3. Instruct Laboratory to base mix design on use of materials tested and approved by Owner's Testing Agency.
 - 4. Include compression strength test reports with mix design per CBC Section 1904A and 1905A.1.9
 - 5. Design Mix, test, and adjust when necessary in ample time before first concrete is scheduled to be placed.
 - a. Submit laboratory data and strength test results for revised mix design to Architect prior to using Mix in Project.
 - 6. Ensure mix designs will produce concrete to strengths specified and of uniform density without segregation.
 - 7. When mix yield exceeds 1-cubic yard, modify mix design to no more than one cubic yard without changing cement content.
 - 8. Contractor's mix designs are subject to review by Architect and Owner's Testing Agency.
 - 9. Introduction of calcium chloride will not be permitted.
 - 10. Water/Cement Ratio: 0.45 maximum, unless noted otherwise on Structural Drawings.
- B. Admixtures:
 - 1. Where use of admixtures has been approved, provide admixtures produced by establish reputable manufacturers.
 - a. Conform to types of admixtures specified under "Materials" Article.
 - b. Use in compliance with manufacturer's printed directions.
 - c. Do not use admixtures which have not been incorporated and tested in accepted mix designs.
 - d. Refer to CBC Section 1903A.6 and ACI 318 Section 26.4.2.2(b) as modified.
- C. Patching Mortar:
 - 1. Mix in proportions by volume of one part cement to two parts fine sand.
- D. Non-Shrink, Non-Metallic Grout:
 - 1. Follow approved manufacturer's printed instructions and recommendations.

2.04 MIXING

- A. Batching Plant Conditions:
 - 1. Ensure equipment and plant will afford accurate weighing, minimize segregation and will efficiently handle materials to satisfaction of Architect and Owner's Testing Agency.
 - 2. Use approved moisture meter capable of determining moisture content of sand.
- B. General Requirements:
 - 1. Thoroughly clean concrete equipment before use for architectural concrete mixes to avoid contamination.

- 2. Mix cement, fine and coarse aggregates, admixtures and water to exact proportions of mix designs.
 - a. Use method of mixing complying with ACI 318, Section 26.4
- 3. Measure fine and coarse aggregates separately according to approved method which provides accurate control and easy checking.
- 4. Adjust grading to improve workability; do not add water unless otherwise directed.
- 5. Maintain proportions, values, or factors of approved mixes throughout Work.
- 6. Mix concrete in transit mixers five minutes immediately prior to discharge in addition to mixing as called for by ACI 304 and ASTM C 94.
- C. Admixtures:
 - 1. Use automatic metering dispenser to introduce admixture into mix.
 - 2. Use Dispenser recommended and calibrated by admixture manufacturer.

2.05 FINISH MATERIALS

- A. General:
 - 1. Provide concrete sealer materials complying with requirements of SCAQMD Rule 1113.
- B. Concrete Sealer **Type 1**:
 - Clear, Water-based, low odor, penetrating water, oil, and stain repellent.
 a. VOC Compliant: less than 100 g/L
 - 2. Use for concrete slabs, walls, and columns, where indicated in Finish Schedule.
 - 3. Products:
 - a. Subject to compliance with specified requirements, provide following, or approved equal:
 - 1) Consolideck Concrete Protector WB by Prosoco, Inc..
 - b. Complies with SCAQMD Rule 1113.
 - c. Complies with ANSI/NFSI B101.3 for slip-resistance.
- C. Concrete Sealer **Type 2**:
 - 1. Lithium-Silicate sealer, hardener, and densifier.
 - 2. Use for concrete slabs where indicated in Finish Schedule:
 - 3. Products:
 - a. Subject to compliance with specified requirements, provide following, or approved equal:
 - 1) Conslideck LS by Prosoco, Inc.
 - b. Comply with SCAQMD Rule 1113 and requirements for low-emitting materials as specified in Section 01 3329.
 - c. Comply with ANSI/NFSI B101.3 for slip-resistance.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas where formwork will be constructed and verify that:
 - 1. Excavations are sufficient to permit placement, inspection, and removal of forms.
 - 2. Excavations for earth forms have been neatly and accurately cut.
 - 3. Conditions are otherwise proper for formwork construction.

- 4. Do not start Work until unsatisfactory conditions have been corrected.
- B. Examine units of Work to be cast and verify that:
 - 1. Construction of formwork is complete.
 - 2. Required reinforcement, inserts, and embedded items are in place.
 - 3. Form ties at construction joints are tight.
 - 4. Concrete-receiving places are free of debris.
 - 5. Depths of depressed slab conditions are correct for delayed finish noted and for its proper bonding to concrete.
 - 6. Conveying equipment is clean and properly operating.
 - 7. Architect has reviewed formwork and reinforcing steel and that preparations have been checked with Project Inspector.
- C. Do not begin placement of concrete before unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Obtain necessary information for coordination of formwork with items to be embedded in concrete and other related work.
- B. Ensure availability of sufficient labor, equipment and materials to place concrete correctly in accordance with scheduled casting.
- C. Protect finished surfaces adjacent to concrete-receiving places.
- D. Clean transportation and handling equipment at frequent intervals and flush thoroughly with water before each day's run.
 - 1. Do not discharge wash water into concrete form.
- E. Construction Joints:
 - 1. Clean and roughen construction joint contact surfaces by removing surface laitance and exposing sound mortar.
 - 2. Sandblasting and bush-hammering are acceptable methods.

3.03 FORMWORK CONSTRUCTION

- A. General:
 - 1. Design, erect, support, brace, and maintain formwork to support vertical and lateral, static, and dynamic loads that might be applied until concrete structure can support such loads.
 - a. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
 - b. Maintain formwork construction tolerances complying with ACI 347.
 - 2. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb Work in finished structures.
 - a. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in Work.
 - b. Use selected materials to obtain required finishes.
 - c. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.

- 3. Frame openings where indicated on Architectural Drawings.
- B. Formed Elements:
 - 1. Carefully align inside and outside forms before tightening ties.
 - 2. Plywood Forms: Insure vertical joints are plumb and horizontal joints are level; arrange joints and ties in geometrical pattern as approved by Architect.
 - 3. Form inside corners at exposed conditions with mitered boards or plywood so that no concrete is placed against form ends.
 - 4. After erection, seal cracks, holes, slits, gaps, and apertures in forms so that they will withstand the pressure and will remain completely watertight.
 - 5. Provide means to seal bottom of forms at construction joints such as foam tape or other gasket devices.
 - 6. Apply coating of release agent prior to erection of formwork following approved manufacturer's recommendations.
- C. Expansion Joints:
 - 1. Provide in exterior concrete paving on grade at maximum 24 feet on center or as noted and at intersections with vertical surfaces, curbs, manholes or other penetrations through paving.
 - 2. Use fiber type expansion joint fillers typically and depress 1/4 inch unless otherwise noted.
 - 3. Use cork type expansion joint fillers at conditions with non-bituminous waterproofing, liquid waterproofing, or sealant systems.
- D. Construction Joints:
 - 1. Provide where shown on Drawings as directed by Architect and per ACI 318, Section 26.5.6.
 - 2. Provide key indentations at joints.
 - 3. Provide pour strips on inside face of forms at horizontal joints, but remove strips and thoroughly clean out reglets before placing subsequent portions of wall.
 - 4. Prevent formations of shoulders and ledges.
 - 5. Provide means for drawing forms into firm contact with concrete before placing additional concrete over previous pours where shrinking and warping has separated concrete from forms.
- E. Embedded Items:
 - 1. Properly locate, unless locating is specified elsewhere, and place inserts and embedded items required by other trades prior to casting concrete.
- B. Formed Elements:
 - 1. Carefully align inside and outside forms before tightening ties.
 - 2. Plywood Forms:
 - a. Insure vertical joints are plumb and horizontal joints are level; arrange joints and ties in geometrical pattern as approved by Architect.
 - 3. Form inside corners at exposed conditions with mitered boards or plywood so that no concrete is placed against form ends.
 - 4. After erection, seal cracks, holes, slits, gaps, and apertures in forms so that they will withstand the pressure and will remain completely watertight.
 - 5. Provide means to seal bottom of forms at construction joints such as foam tape or other gasket devices.
 - 6. Apply coating of release agent prior to erection of formwork following approved manufacturer's recommendations.

- C. Expansion Joints:
 - 1. Provide in exterior concrete on grade at maximum 24 feet on center or as noted and at intersections with vertical surfaces, curbs, manholes or other penetrations through slabs.
 - 2. Use fiber type expansion joint fillers typically and depress 1/4 inch unless otherwise noted.
 - 3. Use cork type expansion joint fillers at conditions with non-bituminous waterproofing, liquid waterproofing, or sealant systems.
- E. Construction Joints:
 - 1. Provide where shown on Drawings as directed by Architect and per ACI 318, Section 26.5.6.
 - 2. Provide key indentations at joints.
 - 3. Provide pour strips on inside face of forms at horizontal joints, but remove strips and thoroughly clean out reglets before placing subsequent portions of wall.
 - 4. Prevent formations of shoulders and ledges.
 - 5. Provide means for drawing forms into firm contact with concrete before placing additional concrete over previous pours where shrinking and warping has separated concrete from forms.
- F. Embedded Items:
 - 1. Properly locate, unless locating is specified elsewhere, and place inserts and embedded items required by other trades prior to casting concrete.

3.04 REINFORCING PLACEMENT

- A. General:
 - 1. Place bars as noted.
 - 2. Reinforcement to be continuous.
 - a. Refer to Structural Drawings for lap splice schedule.
 - b. Stagger splices where possible.
 - c. Securely wire contact lap splices together to maintain alignment.
 - 3. Ensure placement will permit concrete protection in conformance with CRSI or to extent shown.
 - 4. Support and fasten bars securely with spacers, chairs or ties to permit their being walked upon without displacement or movement both before and during placement of concrete.
 - a. Wire-tie bar intersections.
 - 5. Do not bend bars around openings or sleeves.
 - a. Wherever conduits, piping, inserts, or sleeves, and like items interfere with placing of reinforcement, obtain Architect's approval of placing before concreting.
 - 6. Do not field bend bars unless expressly noted in Contract Documents.
- B. Prior to placing concrete, verify reinforcement has been bent, positioned, and secured in accordance with Drawings; ensure removal of oil, grease, dirt, or other bond-weakening coatings; replace severely rust-pitted reinforcing bars.
- C. Quality Assurance:
 - 1. Project Inspector will inspect placement of reinforcement and notify Structural Engineer of discrepancies in placement.

2. Owner's Testing Agency will inspect shop and field welding of reinforcing bars in accordance with CBC Section 1903A.8; 1705A.3.1 - Table 1705A.3, Item 2 and Table 1705A.2.1, Item 5b

3.05 CONCRETE PLACEMENT

- A. Notify Project Inspector, Architect, Structural Engineer, Testing Laboratory and DSA at least 48 hours before placing concrete.
- B. Place concrete in accordance with CBC Section 1705A and ACI 318.
- C. Place concrete in cycles as continuous operation to permit proper and thorough integration and to complete scheduled placement.
 - 1. Do not place concrete where sun, wind, heat, or facilities prevent proper finishing and curing.
- D. Convey concrete as rapidly and directly as practicable to preserve quality and to prevent separation from re-handling and flowing.
 - 1. Do not deposit concrete initially set.
 - 2. Place concrete within ninety minutes after adding water unless otherwise noted.
 - 3. Re-tempering of concrete which has partially set will not be permitted.
- E. Take precautions to avoid damage to under-slab moisture barrier and displacement of reinforcement and formwork.
- F. Deposit concrete vertically in its final position.
 - 1. Avoid free falls in excess of six feet where reinforcement will cause segregation and in typical conditions unless Architect approves otherwise.
- G. Keep forms and reinforcement clean above pour line by removing clinging concrete with wire brush before placing next lift.
 - 1. Remove leakage through forms.
- H. Interruption in placement longer than 60-minutes will be cause for discontinuing placement for remainder of day.
 - 1. In this event, cut back concrete and provide construction joints as Architect directs
 - 2. Clean forms and reinforcement as necessary to receive concrete at later time.
- I. Hot Weather Concreting:
 - 1. Conform to ACI 305 and following requirements when mean daily temperature rises above 75 degrees F.
 - 2. Establish upper temperature limit of concrete mixes for each class of concrete.
 - a. Ensure that concrete temperature during placing are not so high as to cause difficulty from loss of slump, flash set, or cold joints, and do not exceed 90 degrees F.
 - b. Consider other project climatic conditions detrimental to concrete quality such as relative humidity, wind velocity, and solar radiation.
 - 3. Make trial batches of concrete for each mix design at limiting mix temperature selected.

- a. In lieu of trial batches, submit compression strength test reports (20 minimum) at limiting temperature for each proposed mix to Owners testing laboratory for review.
- 4. Employ practices to maintain concrete below maximum limiting temperature in accordance with ACI 305.
 - a. Concrete ingredients may be cooled before mixing, or flake ice or wellcrushed ice of size that will melt completely during mixing may be substituted for part of mixing water.
- 5. Employ practices to avoid potential problems of hot weather concreting in accordance with ACI 305.
- 6. When temperature of reinforcing steel or steel deck forms is greater than 120 degrees F, spray reinforcing and forms with water just prior to placing concrete.
- J. Cold Weather Concreting:
 - 1. No placement of concrete will be allowed at temperatures below 20 degrees Fahrenheit or when mean daily temperature for curing period is anticipated to be below 20 degrees Fahrenheit.
 - 2. No concrete placement will be allowed on frozen sub-grade.
 - 3. Conform to ACI 306 and following requirements when mean daily temperature falls below 40 degrees Fahrenheit.
 - a. Ensure that reinforcement, forms, or ground to receive concrete are completely free from frost.
 - b. Temperature of concrete at time of placement for footings not to be lower than 50 degrees Fahrenheit.
 - 1) Minimum temperature at time of placement for other concrete to be 60 degrees Fahrenheit.
 - 2) Maximum temperature at time of placement to be 90 degrees Fahrenheit.
 - c. Maintain concrete at temperature no lower than 50 degrees Fahrenheit for minimum 7 day period after placement by means of blanket insulation, heaters, or other methods as approved by Architect.
 - d. Keep record of concrete surface temperature for first 7 days after each pour.
 - 1) Make Record open to inspection by Architect.
- K. Consolidating:
 - 1. Use vibrators for thorough consolidation of concrete.
 - 2. Provide vibrators for each location during simultaneous placing to ensure timely consolidation around reinforcement, embedded items and into corners of forms; ensure availability of spare vibrators in case of failures.
 - a. Vibrate through full depth of freshly placed concrete.
 - 3. Do not place vibrators against reinforcement, attach to forms, or use to spread concrete.
 - 4. Exposed Concrete:
 - a. Vibrate with rubber type heads and, in addition, spade along forms with flat strap or plate.
- L. Construction Joints:
 - 1. Verify location and conformance with typical details
 - a. Provide only where designated or approved by Architect.
 - b. Comply with ACI 318, Section 26.5.6

- 2. Horizontal and vertical construction joints to be thoroughly sandblasted to clean and roughen entire surface to minimum 1/4-inch relief exposing clean coarse aggregate solidly embedded in mortar matrix.
- 3. Just prior to depositing concrete, wet surface of construction joint thoroughly.
- M. Contraction (Control) Joints in Slabs-on-Grade:
 - 1. Construct contraction joints in slabs-on-ground to form panels of patterns indicated on Shop Drawings.
 - a. Use saw cuts 1/8 inch x 1/4 slab depth, unless otherwise indicated.
 - 2. Time saw cutting to allow sufficient curing of concrete to prevent raveled or broken edges.
 - 3. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate, maximum 24 hours after pouring.
 - 4. When joint pattern is not shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible; at column centerlines, half bays, third-bays
- N. Formed Elements:
 - 1. Space points of deposit to eliminate need for lateral flow.
 - a. Placing procedures of concrete in forms permitting escape of mortar, or flow of concrete itself, will not be permitted.
 - 2. Level top surface upon stopping Work.
 - 3. Take special care to fill each part of forms by depositing concrete directly as near final position as possible, and to force concrete under and around reinforcement, embedded items, without displacement.
 - 4. After concrete has taken its initial set, exercise care to avoid jarring forms or placing strain on ends of projecting reinforcement.

3.06 CURING

- A. General Requirements:
 - 1. Deploy curing measures immediately after placement and for measures other than application of curing compound, extend for seven days.
 - a. Architect may recommend longer periods based upon prevailing temperature, wind and relative humidity.
 - b. Comply with ACI 318, Section 26.5.3.
 - 2. Avoid alternate wetting and drying and fluctuations of concrete temperature.
 - 3. Protect fresh concrete from direct rays of sun, rain, freezing, drying winds, soiling, and damage.
 - 4. Do not permit curing method to affect adversely finishes or treatments applied to finish concrete.
- B. Curing Method, Typical:
 - 1. Keep forms and concrete surfaces moist during period forms are required to remain in place.
 - 2. Obtain Architect's approval of alternate measures.

3.07 FORM REMOVAL

A. Secure Architect's approval for time and sequence of form removal.

- B. Form Removal:
 - 1. Remove forms carefully to avoid damaging corners and edges of exposed concrete.
 - 2. Remove forms after concrete has developed sufficient strength to sustain its own weight and superimposed loads, but not before concrete compressive strength has reached 0.70 f'c and 7 days minimum time, or as otherwise specified by Architect.
 - 3. Estimated curing time required to obtain desired strength:
 - a. Present results of 7 day test cylinder break to Architect to demonstrate compliance with above specified strength requirements prior to form removal.
 - b. Where 7 day test cylinder break demonstrates strength that is less than that specified, Contractor may elect to take additional cylinders at time of next pour to demonstrate strength requirements.
 - c. Cost of taking and testing additional sample will be borne by Contractor.
- C. Reuse of Forms:
 - 1. Architect will approve reuse of forms provided they are straight, clean, free from nails, dirt, hardened concrete, or other injurious matter and edges and surfaces are in good condition.
 - 2. Clean and repair damage caused by placing, removal, or storage.
 - a. Reuse of formwork with repairs or patches which would result in adverse effects to architectural concrete finish will not be permitted.
 - 3. Store formwork in manner to prevent damage or distortion.
 - 4. Reseal as required to achieve concrete of specified quality.
 - a. Form Sealer:
 - 1) Pre-Form 100 by Nox-Crete Products Group, Omaha, NE, or approved equal.

3.08 CLEANING, PATCHING, AND DEFECTIVE WORK

- A. Where concrete is under strength, out of line, level or plumb, or shows objectionable cracks, honeycombing, rock pockets, voids, spalling, exposed reinforcement, signs of freezing, or is otherwise defective, and, in Architect's judgment, these defects impair proper strength or appearance of Work, Architect will require its removal and replacement at Contractor's expense.
- B. Immediately after stripping and before concrete is thoroughly dry, patch minor defects, form-tie holes, honeycombed areas, and similar areas, with patching mortar.
 - 1. Install patch to match finish of adjacent surface unless otherwise noted.
 - 2. Remove ledges and bulges.
- C. Compact mortar into place and neatly file defective surfaces to produce level, true planes.
 - 1. After initial set, dress surfaces of patches mechanically or manually to obtain same texture as surrounding surfaces.
- D. Rock Pockets:
 - 1. Cut out to full solid surface and form key.
 - 2. Thoroughly wet before placing mortar.
 - 3. Where Architect deems rock pocket too large for satisfactory mortar patching as described, cut out defective section to solid surface, key and pack solid with concrete to produce firm bond and match adjacent surface.
- E. Cleaning
 - 1. Ensure removal of bituminous materials, form release agents, bond breakers, curing compounds when permitted, and other materials employed in concrete work which would otherwise prevent proper application of sealants, liquid waterproofing, and other delayed finishes and treatments.
 - 2. Where cleaning is required, take care not to damage surrounding surfaces or leave residue from cleaning agents.

3.09 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.
 - 1. Comply with requirements in Section 03 0130 for concrete repair at Pool Deck.
- B. Remove and replace concrete having defective surfaces when defects cannot be repaired to satisfaction of Architect.

3.10 CONCRETE SLAB FINISHES

- A. General:
 - 1. Comply with recommendations in ACI 302.1 R for screeding, restraightening, and finishing operations for concrete surfaces.
 - 2. Do not wet concrete surfaces.
- B. Float Finish:
 - 1. Apply float finish to following slab surfaces:
 - a. Surfaces to receive trowel finish
 - b. Surfaces which are to be covered with membrane, fluid-applied waterproofing, or membrane roofing.
 - c. Other finishes as specified
 - 2. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating.
 - 3. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both.
 - 4. Consolidate surface with power-driven floats, or by hand-floating where area is small or inaccessible to power units.
 - 5. Check and level surface plane not exceeding tolerances specified in Article 2.06 when tested with 10 foot straightedge.
 - a. Cut down high spots and fill low spots.
 - b. Uniformly slope surfaces to drains.
 - c. Immediately after leveling, refloat surface to uniform, smooth granular texture.
- B. Broom Finishes:
 - 1. Light Textured Broom Finish:
 - a. Provide light texture by drawing soft bristle broom lightly across concrete surface in one directions, as indicated on Drawings, to provide uniform fine line texture finish.

3.11 CONCRETE SEALER APPLICATION

A. Apply specified sealers only to concrete surfaces where scheduled in Finish Schedule.

- B. Apply sealers only to surfaces that are sound, properly troweled and finished, and that are clean, dry, and free of form release agents, retarders, alkali, curing compounds, oil, grease and other contaminants.
 - 1. Acid-clean and etch discolored or stained slabs before sealer is applied when, in Architect's judgment, satisfactory uniform finish cannot be otherwise achieved.
- C. Apply Sealer Type 1 to following surfaces:
 - 1. Floor slabs, not scheduled to receive other floor coverings or Sealer Type 2.
 - 2. Walls and columns where scheduled or indicated.
- D. Apply Sealer Type 2 only to concrete slabs where scheduled or indicated.

3.12 FIELD QUALITY CONTROL

- A. Owner's Testing Agency will:
 - 1. Perform testing in accordance with ACI 318 and CBC Section 1903A and 1905A.
 - 2. Review concrete mix designs.
 - 3. Inspect concrete and grout placement continuously.
 - 4. Test concrete to control slumps according to ASTM C143.
 - 5. Continuously monitor concrete temperature as it arrives on Project Site.
 - 6. Test concrete for required compressive strength in accordance with CBC Section 1705A.3 Table 1705A.3, Item 6; 1905A.1.16; and ACI 318 Section 26.12 as modified:
 - a. Make and cure three specimen cylinders according to ASTM C 31 for each 50 cubic yards, or fraction thereof, of each class poured at Project Site each day.
 - b. Retain one cylinder for 7 day test and two for 28-day test.
 - c. Number each cylinder 1A, 1B, 1C, 2A, 2B, 2C, and so on.
 - 1) Date each set; and keep accurate record of pour each set represents.
 - d. Transport specimen cylinders from Project to laboratory after cylinders have cured for 24 hours on Project Site.
 - e. Cover cylinders and keep at air temperatures between 60 and 80 degrees Fahrenheit.
 - f. Test specimen cylinders at age 7 days and age 28 days for specified strength according to ASTM C 39.
 - Base strength value on average of two cylinders taken for 28 day test.
 - 7. Test and inspect materials, as necessary, in accordance with ACI 318, MM Test Method 227 (Coarse and Intermediate Aggregates) and MM Test Method 217 (Fine Aggregates), for compliance with requirements specified in this Section.
- B. Submit ticket for each batch of concrete delivered to Project Site.
 - 1. Provide following information on Ticket:
 - a. Design mix number.
 - b. Signature or initials of ready mix representative.
 - c. Time of batching.
 - d. Weight of cement, aggregates, water and admixtures in each batch with maximum aggregate size.
 - e. Total volume of concrete in each batch.

- f. Notation to indicate equipment was checked for contaminants prior to batching.
- 2. Pay Owner's Testing Agency for taking core specimens of hardened structure and testing specimen according to ASTM C 88 and C 42 when laboratory tests of specimen cylinders show compressive strengths below specified minimum.

3.13 CLEANING

- A. Perform Work to keep affected portions of Project Site neat, clean, and orderly.
 - 1. Remove, immediately upon completion of Work, surplus materials, rubbish, and equipment associated with or used in performance.
 - 2. Be aware that failure to perform clean-up operations within 24 hours of notice by Architect will be considered adequate grounds for having work done by others at no added expense to Owner.

3.14 PROTECTION

- A. Protect concrete from injurious action of elements and defacement during construction operations.
- B. Protect exposed corners of concrete from traffic or use which will damage them.
- C. Make provisions to keep exposed concrete free from laitance caused by spillage or leaking forms or other contaminants.
 - 1. Do not allow laitance to penetrate, stain, or harden on surfaces which have been textured.

END OF SECTION 03 3000

SECTION 04 2200

CONCRETE UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

a.

- 1. Concrete Unit Masonry Work, including but not limited to:
 - Concrete Masonry Units.
 - 1) Including masonry wall caps.
 - b. Mortar and Grout
 - c. Installation of reinforcing steel furnished under Section 03 3000
 - d. Control Joints
 - e. Testing and Inspection.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 01 4500: Quality Control; testing laboratory services.
 - 3. Section 03 3000: Cast-in-Place Concrete; furnishing of reinforcing steel for masonry work and placing of dowels in concrete for start of masonry work.
 - 4. Section 07 2726: Fluid-Applied Membrane Air Barriers
 - 5. Section 07 1923: Water Repellent/Graffiti-Resistant Coatings
 - 6. Section 07 9200: Joint Sealants; sealant and backer rod for joints in concrete masonry.
- C. Products Installed But Not Furnished Under This Section:
 - 1. Reinforcing steel for masonry work.

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 21A Masonry
- B. American Concrete Institute (ACI):
 - 1. ACI 315 Manual of Standard Practice for Detailing Reinforced Concrete Structures.
 - 2. ACI 318 Building Code Requirements for Structural Concrete.
 - 3. Building Code Requirements for Masonry Structures TMS 402 / A530 / ASCE 5
 - 4. Specification for Masonry Structures TMS 602 / ACI 530.1 / ASCE 6
- C. ASTM International (ASTM):
 - 1. ASTM A 1064 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
 - 2. ASTM C 90 Standard Specification for Loadbearing Concrete Masonry Units
 - 3. ASTM C 94 Standard Specification for Ready Mixed Concrete.
 - 4. ASTM C 140 Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units

- 5. ASTM C 270 Standard Specification for Mortar for Unit Masonry.
- 6. ASTM C 426 Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units
- 7. ASTM C 476 Standard Specification for Grout for Masonry

1.03 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's literature describing products, including mix designs, history of compression tests, and mixing requirements as they apply to each different masonry unit, accessory, and other manufactured product to be used in concrete unit masonry construction.
 - 2. Literature includes, but is not necessarily limited to, preformed rubber control joints and mortar and grout additives.
- B. Certificates:
 - 1. Material certificates for following signed by manufacturer and Contractor, certifying that each material complies with requirements designated:
 - a. Each material and grade of reinforcing bars, in accordance with requirements of Section 03 3000.
 - 1) Include mill test reports.
 - b. Each type and size of anchors, inserts, ties, and accessories.
 - 2. Certificate of compliance with standards designated.
 - 3. Plant certificates for concrete masonry units to Owner's Testing Agency, and Architect, stating that units have been properly cured before shipment and that they conform to requirements of these specifications, including but not necessarily limited to, requirements for moisture content per ASTM C 90 Type 1 units.
 - 4. Masonry units shipped without certification will be rejected.
- C. Mix Designs:
 - 1. For mortar and grout.
 - 2. Manufacturer's literature for grout admixtures
- D. Mill Test:
 - 1. Mill test reports for reinforcing steel.
- E. Extreme Weather Procedures:
 - 1. Cold and hot-weather construction procedures evidencing compliance with requirements specified in ACI 530.1 and these specifications.
- F. Shop Drawings:
 - 1. Coordination and shop drawings for concrete masonry unit walls consisting of elevations and sections indicating materials and assembly, color surface finish, courses, and reinforcing.
 - 2. Comply with following requirements:
 - a. Illustrate detailing, fabrication, bending and placement of unit masonry reinforcing bars.
 - b. Comply with ACI 315 showing bar schedules, stirrup spacing, diagrams of bent bars and arrangements of masonry reinforcement.
 - c. Indicate location of conduit, plumbing, and other items embedded in unit masonry walls and coordinate this Work with placement of unit masonry reinforcement.

- d. Provide shop drawings drawn to scale.
- G. Test Reports:
 - 1. Material test reports indicating and interpreting test results relative to compliance with tests described in "Quality Assurance" Article and "Field Quality Assurance" Article.
- H. Samples:
 - 1. Unit Samples:
 - a. Concrete masonry units of each color and texture specified.
 - 2. Accessories embedded in concrete masonry Work.

1.04 QUALITY ASSURANCE

- A. Concrete Unit Masonry Work:
 - 1. Comply with standards and requirements of above references.
 - 2. Where discrepancies exist between references and Contract Documents, comply with requirements of Contract Documents.
- B. Allowable Tolerances:
 - 1. Place concrete unit masonry within 1/8 inch of dimensions noted.
 - 2. Maximum Variation from Plumb of Walls: 1/8 inch in 20 feet.
 - 3. Provide joints with uniform thickness of 3/8 inch unless otherwise noted.
 - a. Joints Variation:
 - 1) Not more than 1/16 inch in adjacent courses within two feet and not less than 5/16 inch thick and not greater than 7/16 inch thick.
- C. Reinforcing Steel:
 - 1. Do not permit reinforcing steel to rust where there is danger of staining exposed surfaces of adjacent concrete.
 - 2. Replace rust-stained concrete and masonry at no additional expense to Owner or Project.
- D. Testing Laboratory Services:
 - 1. Laboratory Selection, Payment, and Reports:
 - a. Comply with requirements of Section 01 4500.
 - 2. Certificates and Reports:
 - a. Collect plant certificates from Contractor for concrete masonry units and mill test reports for reinforcing listed in "Submittals" Article
 - 3. Perform Following Tests:
 - a. Concrete Masonry Units:
 - 1) Sample and test in accordance with ASTM C90, C 140, and C 426
 - b. Portland Cement:
 - 1) Sample and test Portland cement or provide mill test reports, per Sections 01 4500 and 03 3000..
 - c. Mortar and Grout Tests:
 - 1) Comply with CBC, Part 2, Section 2105A.2.2.1.4
 - 2) Take minimum of one set of cylinders on each of first three days of masonry work and at least at one week intervals thereafter.
 - d. Mandatory Tests:
 - Sample and test concrete masonry units for measurement of dimensions, compressive strength, and absorption in accordance with ASTM C140 as follows:

- a) Section 6 Measurement of Dimensions.
- b) Section 7 Compressive Strength.
- c) Section 8 Absorption.
- 2) Compressive Strength Tests of Units:
 - a) Comply with CBC 2105A.2.2.1.2.
- 4. Moisture Content and Drying Shrinkage Testing:
 - a. Conduct moisture content and linear shrinkage testing in accordance with ASTM C 426.
 - b. Maximum linear shrinkage of 0.065 percent from saturated to oven dry condition.
 - c. Provide Test Data that is traceable to units being supplied for Project, and complies with ASTM C 90, Section 8.3.
- 5. Cores:
 - a. Perform core tests on sample concrete masonry Work and structure in accordance with CBC, Part 2, Chapter 21A, Section 2105A.4
 - b. Location of Cores in Structure:
 - 1) As approved by Architect and Division of the State Architect.
- 6. Reinforcing Testing:
 - a. Sample and test reinforcing per Division 01 Sections and Section 03 3000.
 - Field test masonry unit moisture content prior to concrete block installation.
 - a. Refer to "Field Quality Assurance" Article.
- E. Masonry Inspection:

7.

- 1. Masonry work will be continuously inspected during laying by inspector specially approved for that purpose by Division of the State Architect.
- 2. Cost of such inspection will be paid for by Owner.
- F. Comply with provisions of ACI 530 and 530.1, except where exceeded by requirements of Contract Documents.
- G. Mock-Up Panel:
 - 1. Construct mock-up panel approximately 4 feet high by 6 feet long, including corner.
 - a. Do not proceed with masonry construction until sample panel is accepted by Architect.
 - 2. Use full size masonry units which have been selected and approved by Architect to show color range, maximum texture range, bond, mortar, tooling of joints and quality of workmanship in mock-up panel.
 - 3. Retain mock-up panel on Project Site for comparison purposes with actual concrete masonry work.
 - a. Mock-up panel may be part of Project and incorporated into wall system.
 - b. When mock-up panel is not part of wall system, demolish and remove from Project Site after completion and acceptance for Project concrete masonry Work.
- H. Examination Criteria:
 - 1. Examination, selection, and approval are for purpose of achieving final installation of concrete unit masonry with greatest possible uniformity of appearance and structural integrity based on following criteria:
 - a. Conformance with testing and quality assurance measures as specified.
 - b. Color and texture matching per approved mock-up for range, random variation, and finish.

- c. Conformance to Contract Documents and approved shop drawings within specified dimensions and tolerances.
- d. Other criteria as specified.
- 2. Non-conformance with above criteria is grounds for removal and replacement of Work at no cost to Owner.
- 3. Determination that Work complies with specified criteria wil be made by Architect.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged material in original containers with seals unbroken and labels intact until time of use.
- B. Deliver concrete masonry units to Project Site, conforming to moisture requirements of ASTM C90.
 - 1. Ensure that masonry units meet moisture requirements during laying of units and grouting until wall is complete.
- C. Unload and inspect each masonry unit carefully and store on raised platform protected from weather meeting ASTM C90 requirements at time of laying and grouting.
 - 1. Reject and remove from Project Site material not conforming to specification requirements.
 - 2. Reject concrete masonry units that are not in conformance with manufacturer's specifications:
 - a. Color or texture of concrete masonry units deviates from range of colors and textures of approved samples, as determined by Architect.
 - b. Concrete masonry units that are chipped, cracked, or otherwise damaged.
- D. Protect cementitious materials against exposure to moisture.
 - 1. Use of cementitious or other materials that have become caked and hardened from absorption of moisture is not permitted.
- E. Prior to installation, unload concrete masonry units onto working pallets as described in "Preparation" Article.

1.06 PROJECT CONDITIONS

- A. Environmental Conditions:
 - 1. Do not place unit masonry when temperature is below 40 degrees F, unless Architect approves and Contractor provides means for preventing damage from freezing before and after placement.
- B. Protection:
 - 1. Protect surrounding Work as required against damage from masonry Work.
 - 2. Satisfactorily clean and correct damage to surrounding Work resulting from masonry Work.
 - 3. Conforming to Take necessary means and precautions to protect masonry units from moisture absorption during shipping, storage on Project Site, during placement prior to grouting of wall, and during wall construction, until masonry wall is completed and graffiti-resistant coating is applied.

PART 2 PRODUCTS

1

2.01 MATERIALS

- A. General Hollow Concrete Masonry Units:
 - Provide concrete masonry units that have been air cured for not less than 28 days.
 - a. Size:
 - 1) Nominal 8 by 8 by 16 inches, except where otherwise indicated.
 - 2. Provide bond beam units at horizontal reinforcing.
 - 3. Compressive strength of Masonry (f'm) per Structrural Drawings
 - 4. Provide concrete masonry units that have been air cured for not less than 28 days.
 - 5. Manufactured by one of following, or approved equal:
 - a. Angelus Block
 - b. Orco Block
- B. Smooth Face (Precision) Hollow Concrete Masonry Units:
 - 1. Conforming to ASTM C 90, medium weight (115 pcf):
 - a. Smooth face.
 - 2. Color: As scheduled or selected by Architect
- C. Smooth Face (Precision) Cap:
 - 1. Beveled Cap: 8 inhes by 4 inches by 16 inches
 - 2. Color: As scheduled or selected by Architect
- D. Lintels for Concrete Masonry Units:
 - 1. General:
 - a. Conform to requirements for specified concrete masonry units.
 - 2. Reinforced concrete filled U-shaped concrete masonry units
 - 3. Design for load and span per Structural Draeings:
 - a. Reinforce with deformed steel bars.
 - b. Refer to Structural Drawings for quantity and size of reinforcing.
 - 4. Lintels for Exposed Masonry Work:
 - a. Match color and texture of masonry Work.
- E. Provide Concrete Masonry Units that have been air cured for not less than 28 days.

2.02 MORTAR AND GROUT MATERIALS

- A. Cement for Mortar and Grout:
 - 1. Type I or Type II Portland Cement conforming to ASTM C 150.
 - 2. Type II Portland Cement may be used only when it equals strength of Type I.
 - 3. Use low alkali (0.6 percent maximum) type cement for mortar and grout
- B. Sand:
 - 1. Conform to ASTM C 144, except with not less than 3 per cent of sand passing No. 100 sieve.
 - 2. Sand for Grout:
 - a. Conform to ASTM C 404.
- C. Pea Gravel:
 - 1. Conform to ASTM C 33.

- 2. Size Range: No. 8 to 3/8 inch.
- D. Lime:

1. Hydrated lime conforming to ASTM C 207, Type S

- E. Water:
 - 1. Clean, potable, and free from impurities detrimental to mortar and grout.
- F. Mortar Color Pigment:
 - 1. Davis Colors, Solomon Colors, or approved equal.
 - 2. Color: As selected by Architect.

2.03 MASONRY REINFORCEMENT

- A. Reinforcing Bars:
 - 1. Bars:
 - a. New billet steel conforming to following:
 - 1) ASTM A615, Grade 60
 - 2) ASTM A706, Grade 60, where welded.
 - 2. Tie Wires: ASTM A 1064.
 - 3. Comply with requirements of Section 03 3000.

2.04 MASONRY ACCESSORIES

- A. Control Joints:
 - 1. Preformed rubber in profiles required or shown.
 - 2. Provide products by one of following, or approved equal:
 - a. RS Series by Hohmann & Barnard, Inc.
 - b. 2900 Series by Wire-Bond
- B. Additives and Admixtures:
 - 1. Required in grout to:
 - a. Reduce early water loss to masonry units.
 - b. Produce expansive action in plastic grout to offset initial shrinkage and promote bonding of grout to interior masonry unit surfaces.
 - 2. SikaGrout Aid by Sika Corporation, or approved equal.
 - 3. Add admixtures in accordance with admixture manufacturers instructions.
 - 4. Use of admixtures is not permitted unless request is submitted to Architect and Structural Engineer for review and Structural Engineer's approval.
 - 5. Do not use admixtures which have not been incorporated and tested in accepted mix designs.

2.05 MORTAR AND GROUT MIXES

- A. Mortar:
 - 1. CBC Chapter 21A, Section 2103A.8.
 - 2. Conform to ASTM C 270, Type S and Articles 2.1 and 2.6A of TMS 602/ACI 530.1/ASCE 6
 - a. Compressive Strength: Minimum 1,800 psi at 28 days.
 - 3. Mix in batch mechanical mixer permitting accurate control of water amounts.
 - a. Place approximately half of required water and sand into mixer while turning.

- b. Add cement and remainder of sand and water into mixer in that order and mix materials for at least three minutes with minimum of water to produce workable consistency.
- c. Site mixing of mortar is not permitted without review and acceptance of Contractor's procedure by Owner's Testing Agency and Structural Engineer.
- 4. Add lime and continue mixing as long as required to secure uniform mass.
- 5. Total mixing time may not be less than 3 minutes or more than 10 minutes.
- 6. Place mortar in final position within 1 hour after mixing.
 - a. Re-tempering of mortar is not permitted.
 - b. Remove from Work mortar or grout which is unused within one hour after initial mixing.
- B. Grout:
 - 1. CBC Chapter 21 A, Section 2103A.13.
 - 2. Conform to Article 2.2 of TMS 602/ACI 530.1/ASCE 6
 - a. Compressive Strength: Minimum 2,000 psi at 28 days.
 - 3. Mix grout in accordance with ASTM C 94
 - 4. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.
 - a. Per DSA IR 21-2.10:
 - 1) Grout mix complying with requirements of CBC Section 2103A.12.
 - 2) Solidly fill cells with grout in reinforced hollow unit masonry per CBC Section 2104A5.1.1.
 - 3) Use coarse grout in grout spaces 2 inches or more in width and in filled cells per CBC Section 2104A.5.
 - 4) Sufficient water may be added to make workable mix that will flow into masonry voids without separation or segregation.
 - 5) Grout Slump: 8 to 11 inches per TMS 602, Article 2.6 B.2 and ASTM C 476, Section 4.2.2.
 - 6) Provide grout mixes containing approved admixture conforming to specified requirements.
 - 7) Use approved admixture in strict accordance with manufacturer's instructions and appropriate listing from ICC-ES or other acceptable evaluation agency per IR A-5
 - 5. Use grout aid in grout to reduce early water loss to masonry units and produce expansive action in grout sufficient to offset initial shrinkage.
 - a. Mix grout admixture in accordance with manufacturer's recommendations and requirements.
 - 6. Use sufficient water to make workable mix that will flow into joints of masonry units with typical rates of absorption for ASTM C 90 Type I units.
- C. General Mixing Requirements:
 - 1. Measure materials accurately.
 - 2. Shovel measurements will not be permitted.
 - 3. Use mechanical mixer of at least one-sack capacity.
 - 4. Completely empty drum before charging succeeding batch of materials.
 - 5. Exercise extreme care in measuring ingredients for partial batches.
 - 6. Comply with mixing requirements of ACI 318.

2.06 SOURCE QUALITY CONTROL

- A. Source Limitations for Masonry Units:
 - 1. Obtain exposed masonry units of uniform texture and color, or uniform blend within ranges accepted for these characteristics, with units from same batch, through one source from single manufacturer.
 - 2. Use only one source for concrete masonry units throughout Work.

2.06

PART 3 EXECUTION

3.01 INSPECTION

- A. Examine areas to receive masonry and verify following:
 - 1. Foundation surface is level to permit bed joint within range of 1/4 to 3/4 inch.
 - 2. Edge is true to line to permit projection of masonry to less than 1/4 inch.
 - 3. Projecting dowels are free from loose scale, dirt, concrete, or other bond-inhibiting substances and properly located.
- B. Do not begin before unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean concrete surfaces to receive masonry.
- B. Remove laitance or other foreign material lodged in surface by sandblasting or other means as required.
- C. Ensure masonry units are clean and free from dust, dirt, or other foreign materials before laying.
- D. Roughen concrete below walls to expose aggregate.
 - 1. Remove loose particles and in hot weather dampen concrete surfaces before laying blocks.
 - 2. Contact surfaces of foundations and floors that are to receive masonry work are to be mechanically roughened to 1/4 inch amplitude.
 - 3. Comply with ACI 318, Section 6.4.
- E. Ensure random color variations in installation of concrete masonry units.
 - 1. Unload from three delivered pallets onto working pallet to be used for construction.
 - 2. Alternate among pallets when unloading to ensure mix of concrete masonry units on working pallet.

3.03 REINFORCING

- A. General:
 - 1. Clean free of loose rust, mill scale, earth, or other materials which will reduce bond to mortar or grout.
 - 2. Shop fabricate to comply with Drawings.
 - 3. Conform to requirements of ACI 315 where specific details are not shown, or where Drawings and Specifications are not more restrictive.

SITE BARRIER REMOVAL PROJECT FULLERTON COMMUNITY COLLEGE NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT

- 4. Do not use reinforcing bars with kinks or bends not shown on Drawings or final shop drawings, or bars with reduced cross-section due to excessive rusting or other causes.
- B. Place bars where noted in accordance with ACI 315 and CBC 2104A and do not disturb after start of masonry placement.
 - 1. Position reinforcing accurately at spacing shown.
 - 2. Support and secure vertical bars against displacement.
 - a. Where vertical bars are shown in close proximity, provide clear distance between bars of not less than nominal bar diameter or 1 inch, whichever is greater.
 - 3. Horizontal reinforcing may be placed as masonry work progresses.
 - a. Lay horizontal reinforcing in bond beam units.
 - 4. Minimum clearance between bar and concrete masonry unit is 1/2 inch and between parallel bars is 1 inch.
 - 5. Horizontal and Vertical Reinforcing:
 - a. Hold in position by wire positioners or spacing devices near ends and at intervals not to exceed 200 bar diameters, and as required to prevent displacement by construction loads or placement of grout beyond tolerances allowed by CBC 2104A.
- C. Splice reinforcing bars where shown.
 - 1. Do not splice at other points unless acceptable to Architect.
 - 2. Provide lapped splices, unless otherwise shown.
 - 3. In splicing vertical bars or attaching to dowels, lap ends, place in contact and wire tie.
 - 4. Provide not less than minimum lap shown, or where not shown, as required by governing code.
 - 5. Weld splices where shown.
 - 6. Comply with requirements of AWS D1.4 for welding materials and procedures and with Section 03 3000 for welded reinforcement.
- D. Completely embed bars in mortar or grout for joint reinforcement embedded in horizontal mortar joints
 - 1. Provide not less than 5/8 inch mortar coverage on exterior face of walls and 1/2 inch at other locations.
 - 2. For other reinforcement provide minimum coverage of one bar diameter over bars, but not less than 3/4 inch except where exposed to weather or soil in which case provide minimum coverage of 2 inches.

3.04 PLACEMENT

- A. General Requirements:
 - 1. Comply with CBC Section 2104A.
 - 2. Ensure masonry units are sound, clean and free of cracking, chipping and broken edges at time of placement.
 - a. Use double open-ended beam units, typical.
 - b. Use proper units to provide for windows, doors, bond beams, lintels, and pilaster, in order to minimize cutting.
 - 3. Accurately cut and fit units as required to accommodate other work using masonry saws.
 - 4. Lay masonry units plumb, true to line, with level courses accurately placed.
 - 5. Adjust unit to final position while mortar is soft and plastic.

- 6. Align vertical cells accurately to provide continuous, unobstructed opening for grouting.
- 7. Remove units disturbed after stiffening of mortar, clean joints, and relay unit with fresh mortar.
- 8. In hot weather, moisten contact surfaces of masonry units to receive mortar immediately before laying to prevent excessive drying of mortar.
- 9. Do not lay up one tier of wall more than 16 inches ahead of other tier.
- 10. Where necessary to stop longitudinal run, rack back one-half block length in each course.
- 11. Do not attach construction supports to walls, except where permitted by Architect.
- 12. Install anchors, bolts, and other embedded items accurately as Work progresses and prior to grouting.
- 13. Coordination:
 - a. Masonry Installer and Reinforcing Steel Installer: Meet and coordinate placement of reinforcing steel prior to placement of concrete or grout.
- B. Bond Pattern:
 - 1. Running bond.
 - 2. Corners:
 - a. Provide standard masonry bond by overlapping units.
- C. Joints:
 - 1. Maintain joint widths shown, except for minor variations required to maintain bond alignment.
 - a. Ensure full coverage of face shells in both horizontal and vertical joints and on webs.
 - 2. Where not otherwise indicated, lay walls with 3/8 inch joints.
 - 3. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials.
 - 4. Joints Exposed to Weather:
 - a. Tool exposed joints slightly concave to achieve solid, smooth, watertight, compacted joints, well bonded to masonry at edges.
 - 5. Rake out mortar in preparation for application of sealants where shown.
 - 6. Immediately fill holes made by line pin with mortar when pin is withdrawn.
 - 7. Remove surplus mortar from joints.
- D. Cold Weather Requirements:
 - 1. When daily temperature is below 40 degrees F., ensure reinforcing, masonry units contacting mortar, and grout are free of frost.
 - 2. Protect mortar and grout from freezing for at least 48 hours after installation whenever temperature falls below 40 degrees F.
 - 3. Maintain mortar and grout at temperature no lower than 50 degrees F., while being used and until installed.
 - 4. In freezing or near freezing weather, provide equipment of adequate size for heating of mortar and grout.
 - 5. Do not add water to mix at temperature greater than 140 degrees F.
- E. Hot Weather Requirements:
 - 1. Implement requirements of approved Hot Weather construction procedures when ambient air temperature exceeds 100 degrees F or 90 degrees F with wind velocity greater than 8 mph.

- F. Protection:
 - 1. Protect face materials against staining.
 - 2. Remove misplaced grout or mortar immediately.
 - 3. Protect sills, ledges, offsets, and similar items from mortar drippings or other damage during construction.
- G. Built-in Work:
 - 1. As Work progresses, build-in items specified under this and other sections of these specifications.
 - a. Fill in solidly with masonry around built-in items.
 - b. Fill space between hollow metal frames and masonry solidly with mortar.
 - c. Solid grout hollow metal door frames where occurring in masonry construction.
 - 2. Install reglets and nailers for flashing and other related work where shown to be built into masonry work.
 - 3. Install bolts, dowels, plates, anchors, hangers and like items where shown to be built into masonry for Work of other trades.
 - 4. Install concrete masonry lintels where shown and following:
 - a. Minimum 8 inch bearing at each end of lintel.
 - b. Align end joints with coursing beyond jambs.
- H. Requirements for Walls to be Grouted by High-Lift Method:
 - 1. Lay up walls full story prior to grouting.
 - a. Brace walls adequately to resist wind lateral and other forces.
 - 2. Build vertical grout barriers or dam of solid masonry across grout space at no more than 25 feet on centers to control horizontal flow of grout.
 - 3. Provide cleanouts by leaving out every other unit in bottom course.
 - a. Seal after inspection and before grouting.
 - b. Allow 24 hour cure time for face shell plugs and adequately brace to resist grout pressure.
 - 4. During laying up, remove mortar fins and other foreign matter from grout space with stick and compressed air.
 - 5. Grout:
 - a. High slump workable mix placed by pumping.
 - 6. Use mechanical vibrators for consolidation.
 - 7. Grout is to be reconsolidated after it has taken on plastic consistency but prior to taking on initial set.
 - 8. "Pour" is considered as entire height of grout fill placed in one day and is composed of number of successive placed grout lifts.
 - 9. "Lift" is layer of grout placed in single continuous operation.
 - 10. Maximum Height of Pour:
 - a. Twelve feet for eight inch walls
 - b. Sixteen feet for twelve inch walls.

3.05 GROUTING

- A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of Contract Documents.
- B. Ensure vertical cells have proper vertical alignment, to maintain continuous unobstructed vertical cell area of 3 by 3 inches.
 - 1. Use grout that is sufficiently fluid to ensure complete filling of every section of units, but not so thin as to allow segregation of aggregate.

- 2. Grout every cell.
- C. Water/Cement Ratio for Grout:
 - 1. Not more then 7-1/2 gallons of water per sack of cement.
- D. Provide grout pours in excess of 24 inch height with cleanouts.
- E. Maximum Lift of Grout Pour:
 - 1. 4 feet, unless high-lift method is used.
- F. When grouting is stopped for period of one hour or longer, form horizontal construction joints by stopping grout one inch below top of uppermost unit.
- G. Grouting of Steel Door Frames:
 - 1. Grout steel door frames where installed in masonry construction with grout specified in Article 2.02
- H. Low-Lift Grouting:
 - 1. Conform to with CBC 2104A.1.3.
 - 2. Limit height of pours to 4 feet.
 - 3. Limit height of masonry to 16 inches above each pour.
 - 4. Pour grout only after vertical reinforcing is in place.
 - a. Place horizontal reinforcing as grout is poured.
 - b. Prevent displacement of bars as grout is poured.
 - 5. Place grout for each pour continuously and consolidate immediately.
 - a. Do not interrupt pours for more than 1-1/2 hours.
- I. When grouting is stopped for more than one hour, terminate grout minimum 1/2 inch, 2 inches maximum below top of upper masonry unit to form positive key for subsequent placement.
- J. Solid grout cells and courses No Exceptions.
 - 1. Consolidate with 3/4 inch diameter mechanical vibrator inserted into each and every cell.

3.06 POINTING AND CLEANING

- A. Point holes or defective mortar joints upon completion of Work.
 - 1. Where necessary, cut out and repoint defective joints.
- B. At end of workday, fiber-brush new surfaces to remove mortar splotches.
 - 1. clean with mild detergent or enzymes, and rinse with clean water.
- C. Do not use acid solution to remove green stain or efflorescence resulting from salts.
 1. Follow recommendations of manufacturer for removal of such stains.
- D. Upon completion of Work, remove from Project Site, surplus materials, rubbish, and debris resulting from Work.

3.07 FIELD QUALITY ASSURANCE

- A. Special Inspections:
 - 1. Special Inspectors:
 - a. Prequalified and approved by DSA and employed by Owner to perform continuous masonry inspection per CBC 1701A.
 - 2. Masonry Inspector Requirements:
 - a. Present at Project Site during masonry construction and perform following duties:
 - 1) Review plans and specifications and meet with Contractor to discuss requirements before Work commences.
 - Before masonry Work commences, hold joint meeting with Contractor and Architect to review requirements for surveillance and quality control of masonry Work.
 - 3) Check brand and type of cement, lime (when used), and source of sand.
 - 4) Inspect foundation or slab to ascertain that it is clean and ready to receive units.
 - 5) Check reinforcing steel dowels for straightness, proper alignment, spacing, size and length.
 - 6) Observe manner in which units are laid up to ensure that joints are full of mortar and kept tight during work.
 - a) Inspect cells to assure that fins will not interfere with grouting or foaming.
 - b) Instruct masons to keep cells clean of mortar droppings and inspect to determine compliance.
 - 7) Observe placing of grout continuously.
 - 8) Perform or supervise performance of required sampling and field-testing as specified.
 - 9) Keep complete record of inspection of work.
 - 10) Report daily to Owner's Representative progress of masonry inspection.
 - 11) Submit verified reports to DSA.
- B. Determine strength of masonry by unit strength method in accordance with CBC 2105A.2.2.1
- C. Mortar and Grout Testing: Test mortar and grout in accordance with ASTM C 780 (mortar) and ASTM C 404 (Grout)

END OF SECTION 04 2200

SECTION 05 5000

METAL FABRICATIONS

PART 1 GENERAL

1.

1.01 SUMMARY

- A. Section Includes:
 - 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.
 - 1. Steel pipe handrails and railing systems:
 - a. Exterior railings of standard seamless steel pipe with high performance coating.
 - b. Steel pipe for handrail modifications
 - c. Backing and mounting plates for handrail brackets.
 - 2. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete for installation of pipe handrails and railing systems.
 - a. Provide setting drawings, templates, instructions and directions for installation of anchorage devices.
 - b. Coordinate delivery with other work to avoid delay.
 - 4. Hollow Structural Section (HSS) steel for sign support frame.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Coded Edition.
 - 2. Section 03 3000: Cast-in-Place Concrete
 - 3. Section 05 5800: Formed Metal Fabrications; S.S. countertops and aluminum cladding for accessible route signs
 - 4. Section 09 9600: High Performance Coatings; shop priming and field

painting of exposed steel components where indicated.

- 5. Section 10 1400: Signage
- C. Related Requirements:
 - Items furnished, but not installed under this Section:
 - a. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete for installation of sign 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

1.

- A. California Code of Regulations (CCR), Title 24, current edition; 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.
 - 2. Part 9, California Fire Code (CFC):
 - a. Chapter 35 Welding and Other Hot Work.
- B. ASTM International (ASTM):
 - 1. ASTM A36 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 A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- 4. ASTM A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- 5. ASTM A780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
- 6. ASTM A 1011 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
- 7. ASTM A 1085 Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS)
- 8. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- 9. ASTM C1107 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
- C. American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI):
 - 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 D1.3 Structural Welding Code Sheet Steel.
 - 3. AWS QC1 Standard for AWS Certification of Welding Inspectors.
- E. American Galvanizers Association, Inc. (AGA):
 - 1. AGA Inspection of Hot-Dip Galvanized Steel Products
- F. Aluminum Association (AA):
 - 1. Aluminum Design Manual, current edition
 - 2. CA-92 Care of Aluminum
 - 3. DAF-45 Designation System for Aluminum Finishes
- G. National Association of Architectural Metal Manufacturers (NAAMM):
 1. AMP 500 Metal Finishes Manual
- H. American Galvanizers Association, Inc. (AGA):
 - 1. AGA Inspection of Hot-Dip Galvanized Steel Products
- I. 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.

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.

- 2. Product Data for Specified Shop Primer System:
 - a. Material List:
 - 1) Provide inclusive list of required coating materials Identify material by manufacturer's catalog number and general classification.
 - b. 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.
- C. Samples:

1.

- 1. As requested by Architect.
- D. Electrode Requirements:
 - 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.
- E. 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.

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- 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.

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 D1.3, and 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.

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.
- B. Manufacturer's Limited Warranty for Prefabricated Ship's Ladder s:
 - 1. Warranty Period: 5 years from date of Substantial Completion.
- C. Ramp Manufacturer Warranty for Prefabricated Access Ramp:
 - 1. Warrant products to be free from defects in material and workmanship in course of manufacturing for period of three years beginning at date of Substantial Completion.
 - 2. Warranty excludes defects resulting from abnormal use in installation, service, accidental or intentional damage or occurrences beyond manufacturer's control.

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PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis-of-Design:
 - 1. Design for handrail and guardrail components:
 - a. Design on ornamental railing systems is based on solid wrought iron rails, rail caps, twisted bars, rivets, wall brackets and steel shoes as manufactured by Indital, USA.
- 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 Article 1.04 and as specified in Section 01 3300, for evaluation of proposed system.
 - 2. Copy of manufacturer's material warranty.

2.02 MATERIALS AND COMPONENTS – GENERAL

- A. Metal Surfaces General:
 - 1. For fabrication of miscellaneous metal work which will be exposed to view, only use materials which are smooth and free of surface blemishes
 - 2. Do not use materials having exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, rolled trade names, roughness, oil canning, stains, discoloration or other imperfections.
- B. Steel Plates, Shapes and Bars:
 - 1. Conforming to ASTM A 36.
- C. Steel Sheets:
 - 1. Conforming to ASTM A 1011, Grade C.
- D. Steel Pipe:
 - 1. Conforming to ASTM A 53; Type S; Grade B; black finish unless galvanizing is required; standard weight (Schedule 40), unless otherwise shown or specified.
- E. Hollow Structural Sections (HSS):
 - 1. Conforming to ASTM A1085
- F. Aluminum Members:
 - 1. Alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish:
 - 2. 6061-T6 or 6063-T5 aluminum alloy, conforming to ASTM B 221 for extrusions and ASTM B 209 for sheet/plate.
- G. Brackets, Flanges and Anchors:
 - 1. Cast or formed metal of same type material and finish as supported rails, unless otherwise indicated.

- H. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.
- I. Nonshrink Nonmetallic Grout:
 - 1. Factory premixed, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.
 - 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.
- J. Shop Primer for Ferrous Metal:
 - 1. Carbozinc 859 VOC Organic Zinc-Rich Epoxy Primer by Carboline Company, Hydro-Zinc 94-H20 by Tnemec Company, or approved equal; VOC compliant.
 - 2. Coordinate selection of primer with finish paint requirements in Section 09 9600.
 - a. Primer and finish coat materials for exposed steel are required to be complete system by one manufacturer
 - 3. Prime painting with specified shop primer is required of structural steel, exposed or concealed, except where indicated otherwise.
- K. 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:
 - 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.
- L. Isolation Between Dissimilar Materials:
 - 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, div. ITW Polymers Sealants North America, or equivalent product acceptable to Architect.
- M. 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.

2.03 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.
 - 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. 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.
- C. 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.

2.04 FABRICATIONS – 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. Sleeves:
 - 1. Furnish sleeves for setting in concrete footing for sign support framing.
 - 2. Fabricate sleeves of HSS with inside dimension nominal 1/2 inch larger than support posts to allow for non-shrink grout.
 - a. Nominal 3-1/2 by 3-1/2 inches by 1/4 inch wall HSS
 - b. Weld 1/4 inch flat plate to bottom of sleeves.
 - 3. Furnish sleeves with hot-dip galvanized finish.

2.05 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. Top of gripping surfaces shall be 34" minimum and 38" maximum vertically above walking surfaces, stair nosings, and ramp surfaces.
 - b. Clearances between handrail gripping surfaces and adjacent surfaces shall be 1½" minimum. Handrail may be located in a recess if the recess is 3" maximum deep and provides 18" minimum clear space above the top of the handrail.

- c. Shall be continuous along their length and shall not be obstructed along their tops or sides. The bottoms of gripping surfaces shall not be obstructed for more than 20% of their length. Where supports are provided, horizontal projections shall occur 1½" minimum below the bottom of the gripping surfaces.
- d. Circular cross section shall have an outside diameter of 1¼" minimum and 2" maximum.
- e. Non-circular cross section shall have an outside dimension of 4" minimum and $6\frac{1}{4}$ " maximum, and a cross-sectional dimension of $2\frac{1}{4}$ " maximum.
- f. Provide gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges
- g. Handrails shall not rotate within their fittings.
- h. Extend gripping surfaces beyond and in same direction of stair flights and ramp runs in accordance with CBC Section 11B-505.10. Such extensions are not required for continuous handrails at the inside turn of switchback or dogleg stairs and ramps.
- i. Orientation of at least one handrail shall be in the direction of the stair run, perpendicular to the direction of the stair nosing, and shall not reduce the minimum required width of the stair, CBC Section 11B-505.2.1
- j. A 2" minimum high curb or barrier shall be provided to prevent the passage of a 4" diameter sphere rolling off the edges on a ramp or landing surface. Such a curb or barrier shall be continuous an uninterrupted along the length of a ramp. CBC Section 11B-405.9.2
- 3. Railings:
 - a. Use nominal 1 inch ASTM A 36 square steel bars with welded steel cap for railings.
 - b. Use nominal 1-1/2 inch ASTM A 36 square steel bars 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. Fittings for Steel Handrails and Railing Systems:

- 1. Provide galvanized ferrous metal fittings, brackets, and fasteners for railings specified or indicated to have galvanized finish.
- 2. Provide non-galvanized ferrous metal fittings, brackets, and fasteners for railings specified to be shop primed and field painted.
- 3. Galvanize anchors and sleeves embedded in concrete construction.
- 4. Secure railings in fittings to prevent rotation of railing.
- D. Post Sleeves:
 - 1. Provide galvanized steel sleeves as detailed, for anchoring railing posts in concrete.
- 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.

2.06 ACCESSIBLE ROUTE SIGN

- A. HSS Steel Support Framing:
 - Fabricate sign support framing of HSS steel as indicated on Drawings.
 a. Nominal Size: 2 by 2 inch by 1/4 inch wall, conforming to ASTM A 1085.
 - 2. Galvanize entire frame per ASTM A 123 after fabrication.
 - 3. Apply specified isolation material to surfaces of framing that will come in contact with aluminum cladding.
- B. Aluminum Cladding for Sign:
 - 1. Refer to Section 05 5800 for aluminum components and finishing.

2.06 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.
 - 3. Completely eliminate burrs, rough spots and pitting from normally exposed ferrous metal items.

- C. Shop Painting:
 - 1. Apply specified shop primer to uncoated surfaces of miscellaneous metal work, except members or portions of members to be embedded in concrete surfaces and edges to be field welded, and galvanized surfaces, unless otherwise specified.
 - 2. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's instructions, and at rate to provide uniform dry film thickness of 2.0 mils for each coat.
 - a. Use painting methods which will result in full coverage of joints, corners, edges and exposed surfaces.
 - 3. Apply one shop coat to fabricated metal items, except apply 2 coats of paint to surfaces inaccessible after assembly or erection.
 - 4. Where shop primer is removed or damaged by assembly procedures, touch up abraded areas with specified primer.
- D. 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 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.
 - a. Touch-up shop primer per Article 3.05.
- B. Placement:
 - 2. Set Work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
 - 3. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
 - 4. Galvanize exposed fasteners to secure to in-place construction.
 - 5. Fasten work tightly to prevent rattle or vibration.
 - 6. Do not tighten fasteners through finish alone without spacer washers.
 - 7. Use nonshrink grout mixed in accordance with manufacturer's direction for setting frames, plates, sills, bolts and similar items.
 - 8. Locate and place sheet metal items plumb, level and in alignment with adjacent work.
 - 9. 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, noncumulative.
 - 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.
 - 2. Perform welding work in accordance with requirements of CFC, Chapter 35.

3.03 INSTALLATION – STEEL PIPE RAILING AND HANDRAIL

- 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 steel round flanges welded to rail ends and anchored into wall construction with lead expansion shields and bolts.

3.04 FIELD PAINTING AND TOUCH-UP

- A. Field Painting:
 - 1. Apply high performance finish to following exposed items in accordance with requirements of Section 09 9600:
 - a. Exposed railings, brackets, and fittings.
- B. Touch-up Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting.
 - 2. Apply by brush or spray to provide minimum dry film thickness of 2.0 mils.
- C. 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.
- D. Repair of Finished Surfaces:

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- 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.

3.05 CLEANING

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

3.06 PROTECTION

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

END OF SECTION 05 5000

SECTION 05 5800

FORMED METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Miscellaneous sheet metal includes items custom-fabricated from metal sheets which are not specified in other sections of these specifications.
 - 2. Types of sheet metal items in this Section include:
 - a. Stainless steel countertops.
 - b. Aluminum sheet cladding for accessible route signs.
- B. Related Sections:
 - 1. Section 05 5000: Metal Fabrications; metal supports for countertops.
 - Section 06 1053: Miscellaneous Carpentry; plywood.
 - 3. Section 10 1400: Signage

1.02 REFERENCES

2.

- A. ASTM International (ASTM):
 - 1. ASTM A 240 Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- B. National Association of Architectural Metal Manufacturers (NAAMM):
 - 1. AMP 500 Metal Finishes Manual
- C. California Air Resources Board (CARB):
 - 1. South Coast Air Quality Management District (SCAQMD):
 - a. SCAQMD Rule 1113 Architectural Coatings
 - b. SCAQMD Rule 1168 Adhesive and Sealant Applications
- D. Sheet Metal & Air Conditioning Contractors' National Association (SMACNA):
 - 1. SMACNA Architectural Sheet Metal Manual, current edition.
- E. Aluminum Association (AA):
 - 1. Aluminum Design Manual current edition
 - 2. Designation System for Aluminum Finishes

1.02 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's product data, installation instructions and general recommendations for each specified miscellaneous sheet metal product.
- B. Shop Drawings:
 - 1. For fabrication of sheet metal work.
 - a. Include plans, elevations and detail sections.
 - b. Indicate jointing, fasteners, anchorage, and accessory items, and specify finishes.

- C. Samples:
 - 1. Minimum of four 8 inch square samples of each metal finish required.
 - 2. Prepare samples on same metal and gage to be used for Work.

1.03 QUALITY ASSURANCE

- A. Shop Assembly:
 - 1. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly.
 - a. Disassemble units only as necessary for shipping and handling limitations.
 - b. Clearly mark units for reassembly and coordinated installation.
- B. Formaldehyde: Provide materials which comply with EPA, ANSI/HPVA and Composite Panel Association standards for control of formaldehyde emissions.

1.04 PRODUCT CONDITIONS

- A. Coordinate Work of this Section with adjoining work for proper sequencing of each installation.
 - 1. Adjoining work includes installation of coiling counter doors and ticket windows.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Provide materials selected for their surface flatness, smoothness and freedom from surface blemishes where exposed to view in finished unit.
 - 2. Do not use materials having exposed-to-view surfaces exhibiting pitting, seam marks, roller marks oil canning, stains, discoloration or other imperfections.
- B. Stainless Steel Sheet:
 - 1. Conforming to ASTM A 240, AISI Type 316, with No.4 finish.
- C. Fasteners:
 - 1. Use fasteners made of same basic metal as fastened metal, unless otherwise indicated.
 - 2. Do Not Use:
 - a. Metals which are corrosive or incompatible with materials joined.
 - b. Exposed fasteners except where unavoidable.
 - 3. Match finish of metal surrounding fastener.
 - 4. Provide Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.
- D. Anchors and Inserts:
 - 1. Use non-ferrous metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance.
 - 2. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors.
 - 3. Furnish inserts, as required, to be set into concrete or masonry work.

- E. Shop Primer for Concealed Steel:
 - 1. Carbozinc 859 VOC Organic Zinc-Rich Epoxy Primer by Carboline Company, Hydro-Zinc 94-H20 by Tnemec Company, or approved equal; VOC compliant.
 - 2. Prime painting with specified shop primer is required of exposed or concealed steel, except where indicated otherwise.
- F. Isolation Coating Between Dissimilar Materials:
 - 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 International, Inc. 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; of type and grade required to seal joints in formed metal; as recommended in writing by formed metal manufacturer.
- H. Laminating Adhesive:
 - 1. Compatible with substrate; noncombustible after curing.
 - 2. VOC content complying with requirements when calculated according to CARB regulations and SCAQMD Rule 1168 as follows:
 - a. Contact Adhesive: Not more than 80 g/L
 - b. Metal-to-Metal Adhesive: Not more than 30 g/L
 - c. Multi-Purpose Construction Adhesive: Not more than 70 g/L.

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. Stainless Steel: 16 gage.
- B. Form sheet metal items in maximum lengths and keep joints to minimum.
 - 1. Do not exposed cut edges of sheet metal except as indicated.
 - 2. Fold back exposed ends of unsupported sheet metal to form 1/2 inch wide hem on concealed side, or ease exposed edges with backing to radius of approximately 1/32 inch.
 - 3. Form items with flat, flush surfaces, true to line and level, and without cracking and grain separation at bends.
- C. 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 and other metal authorities.
 - 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.
- D. Provide straps, plates and brackets as required for support and anchorage of fabricated items to adjoining work.
- E. Reinforce sheet metal items as required for attachment.
- F. Stainless Steel Counters:
 - 1. Comply with general fabrication requirements and following:
 - a. Form stainless steel counters over plywood core as detailed.
 - b. Adhere stainless steel to plywood with specified laminating adhesive.

2.03 ACCESSIBLE ROUTE SIGN

- A. Aluminum Cladding for Sign:
 - 1. Clad steel support frame with 1/8 inch thick aluminum sheet steel conforming to ASTM B 209.
 - a. Weld 1/8 inch aluminum cap to top of sign.
 - 2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
 - a. Ease exposed edges to radius of approximately 1/32 inch, unless otherwise shown.
 - b.. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing Work.
 - 3. Continuously weld joints and seams.
 - a. Grind welds smooth and flush on exposed surfaces.
 - b. Comply with AWS recommendations.
 - c. Use filler metals and welding procedures which will blend with and match color of sheet metal being joined and will avoid discoloration at welds
 - 4. Fabricate joints which will be exposed to weather in manner to exclude water or provide weep holes where water may accumulate.
 - 5. Graphics: Apply indicated graphics of reflective white vinyl conforming to requirements of Section 10 1400.

2.03 SHOP FINISHING

- A. Comply with NAAMM Metal Finishes Manual for finish designations and application recommendations, except as otherwise indicated.
- B. Complete mechanical finishes of flat sheet metal surfaces before fabrication, wherever possible.
 - 1. After fabrication, finish joints, bends, abrasions, and other surface blemishes to match sheet finish.
 - 2. Protect mechanical finishes on exposed surfaces from damage by application of adhesive paper or other temporary protective covering, prior to shipment.
- C. Shop Finish for Accessible Route Sign:
 - 1. Specified primer for field application of high performance coating to aluminum specified in Section 09 9600.
 - Apply primer in shop on following items:
 a. Aluminum cladding on sign.
 - 3. Leave Work ready to receive field applied finish specified in Section 09 9600.

PART 3 EXECUTION

3.01 PREPARATION

- A. Field Measurements: Perform sheet metal work in cooperation with other trades.
 - 1. Where possible, verify size, location and placement of miscellaneous sheet metal work prior to fabrication.
 - 2. Coordinate field measurements and shop drawings with fabrication and shop assembly.
- B. Coordinate setting drawings, diagrams, templates, instructions.

3.02 INSTALLATION

- A. Locate and place sheet metal items plumb, level and in alignment with adjacent work.
- B. Use concealed anchorages where possible.
 - 1. Provide brass or lead washers fitted to screws where required to protect sheet metal surfaces.
- C. Form tight joints with exposed connections accurately fitted together.
 - 1. Provide reveals and openings for sealants and joint fillers, as indicated.
- D. Protect non-ferrous metal surfaces from corrosion or galvanic action by application of heavy coating of specified isolation coating material on surfaces which will be in contact with concrete, masonry or dissimilar metals.
- E. Repair finishes damaged by cutting, welding, soldering and grinding operations required for shop fitting and jointing.
 - 1. Restore finishes so that there is no evidence of corrective work.
 - 2. 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.

END OF SECTION 05 5800

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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 buildings weather and water tight.
- B. Related Sections:
 - 1. Section 09 2900: Gypsum Board; acoustic sealant.
 - 2. Section 09 9100: Painting; paintable caulk.

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. 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.
- C. 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 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.

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
- 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 790 by Dow Silicones.
 - b. General Electric Silpruf SCS2700 by Momentive Performance Products
 - c. Pecora 890NST by Pecora Corp.
 - d. Sikasil WS-290 by Sika Corporation.
 - 3. Apply Sealant No.1 to following exterior joints:
 - a. Joints between metal frame and cast-in-place concrete, or masonry
 - b. Joints between cast-in-place concrete sections
 - c. Vertical expansion and control joints
 - d. Horizontal ceiling/soffit joints
 - e. Sills, jambs, and heads of window frames, door frames, louvers and similar openings, and where metal, wood, or other materials abut or join concrete, or each other
 - f. Other exterior joints
 - 4. Apply Sealant No. 1 to following interior joints:
 - a. Hidden metal to metal storefront joints expected to undergo minimal movement
 - b. Under door thresholds

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- c. Vertical expansion and control joints
- d. 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. Urexpan NR-200 by Pecora, Corp.
 - d. Sikaflex-2C SL by Sika Corporation
- 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.4:

- 1. Silicone rubber based, one-part, medium-modulus, neutral curing sealant; Type S, Grade NS, Class 50.
- 2. Provide one of following products:
 - a. DOWSIL 756 SMS by Dow Silicones.
 - b. GE SCS9000 SilPruf NB by Momentive Performance Products.
 - c. Pecora 864NST by Pecora Corp.
 - d. Sikasil WS-605 S by Sika Corporation
- 3. Apply Sealant No.4 to following exterior joints:
 - a. Vertical expansion and control joints in tile and concrete.
 - b. Horizontal ceiling/soffit joints
 - c. Other exterior joints where non-staining sealant is required.

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
 - Provide sealant manufacturer's laboratory test results on current production sealant for applicable characteristics and properties listed in ASTM C 920, Section 8
 - 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 glazing materials and other accessory materials which may be in contact with sealant
 - 6. Results of manufacturer's tests are to be available with certification specified in 1.03 C and for the preconstruction meeting specified in 1.04 C.
 - 7. Acceptable Test Results:
 - a. Peel Adhesion Strength:
 - 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.
- 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 FIELD QUALITY CONTROL

- A. Testing Services:
 - 1. Owner will provide services of testing laboratory to make tests of field installed sealant
 - 2. Cooperate with laboratory personnel and provide materials and facilities required for testing
 - 3. Work found to be deficient is to be removed and replaced at Contractor's expense
 - 4. Costs for additional inspection and testing resulting from investigating and retesting deficient work will be paid by Contractor.
- B. Field Inspections by Sealant Manufacturer:
 - 1. Periodic field inspections performed by sealant manufacturer's technical representative.
 - 2. Include representative's certification that sealant was properly installed in accordance with application instructions
 - 3. Identify improper Work which was discovered and describe changes in application instructions for later work
 - 4. Furnish final inspection report on completed Work, and certification to Owner that sealant was properly installed
- C. Field Testing by Contractor:
 - 1. Perform field tests on each lot of sealant received for tack-free time and proper curing.
 - 2. Conform to the sealant manufacturer's instructions
 - 3. Document results by lot number in quality control log

3.05 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 09 2513

PORTLAND CEMENT PLASTER

PART 1 GENERAL

1.

3.

6.

1.01 SUMMARY

- A. Section Includes:
 - Portland Cement Plaster.
 - a. Acrylic-Based Finish Coat Over Concrete Unit Masonry walls.
 - b. Exterior Plaster Soffits.
 - 2. Metal Lath and Accessories.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 06 1053: Miscellaneous Carpentry.
 - Section 04 2200: Concrete Unit Masonry; substrate for plaster walls.
 - 4. Section 07 9200: Joint Sealants
 - 5. Section 09 2216: Non-Structural Metal Framing; soffit framing.
 - Section 09 2900: Gypsum Board; exterior sheathing at soffits.
 - 7. Section 09 9100: Painting; painting of Portland cement plaster.

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 25 Gypsum Board, Gypsum Panel Products, and Plaster
- B. ASTM International (ASTM):
 - ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 2. ASTM C 847 Standard Specification for Metal Lath
 - 3. ASTM C 926 Standard Specification for Application of Portland Cement Based Plaster
 - 4. ASTM C 933 Standard Specification for Welded Wire Lath
 - 5. ASTM C 1063 Standard Specification for Installation of Lathing and Furring to Receive Exterior Portland Cement-Based Plaster.
 - 6. ASTM D 1784 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
 - ASTM D 4216 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) and Related PVC and Chlorinated Poly (Vinyl Chloride) (CPVC) Building Products Compounds
 - 8. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - 9. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials
- C. International Association of Plumbing and Mechanical Officials (IAPMO):
 - 1. IAPMO Uniform Evaluation Service (UES):
 - a. UES ES ER-2017

1.03 SYSTEM DESCRIPTION

- A. Portland Cement Plaster Over Concrete Masonry Walls:
 - 1. Leveling Coat for Walls:
 - a. Apply 3/8 inch Brown Coat over Concrete Unit Masonry to provide smooth even surface for application of Crack Isolation System (CIS) and Acrylic-Based Finish Coat .
 - 2. Acrylic-Based Finish Coat:
 - a. Consisting of 100 percent acrylic-based finish using latest Dirt Pick-up Resistance (DPR) technology.
 - 1) Formulated with high quality acrylic resins, graded quartz aggregates, and proprietary additives.
 - 2) Providing flexible, durable, integrally colored finish.
 - 3) Acrylic-based finish may be sprayed or troweled to achieve specified texture.

1.04 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's product data and installation instructions for each product specified.
- B. Material Certificates:
 - 1. Producer's certificate for each kind of plaster aggregate indicated evidencing that materials comply with requirements.
- C. Samples:
 - 1. Prepare four 18 inch square sample plaques using materials and workmanship indicating proposed range of colors and texture to be expected in completed Work.
 - a. Submit to Architect and obtain acceptance of color and texture.
 - b. Accepted sample is to be used in construction of mock-ups.
 - 2. Do not begin construction of mock-up until samples have been reviewed and accepted by Architect.

1.05 QUALITY ASSURANCE

- A. Comply with CBC, Chapter 25.
- B. Mock-Ups:
 - 1. Prior to installing plaster work, construct panels for each type of finish and application required to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution.
 - 2. Construct mock-ups to comply with following requirements, using materials indicated for final unit of Work:
 - a. Locate mock-ups on-site in location and of size indicated or, when not indicated, as directed by Architect.
 - b. Erect mock-ups consisting of minimum 4 by 4 foot panel by full thickness in presence of Architect using materials, including lath, support system, and control joints, indicated for final Work.
 - c. Notify Architect 7 days in advance of dates and times when mock-ups will be constructed.

- d. Demonstrate proposed range of color aesthetic effects and workmanship expected in completed Work.
 - 1) Show cut-away in panel exposing weather barrier, metal lath and drainage weep of system on perimeter edge of panel.
 - 2) Obtain Architect's acceptance of visual qualities of sample panel.
- 3. Obtain Architect's acceptance of mock-ups before start of plaster Work.
- 4. Retain and maintain mock-ups during construction in undisturbed condition as standard for judging completed Portland cement plaster work.
- 5. When directed, remove mock-ups from Project Site.
 - a. Accepted mock-ups in undisturbed condition at time of Substantial Completion may become part of completed unit of Work.
- C. Contact local architectural representative/technical consultant of plaster finish manufacturer to provide consultation with installer for application of finish on samples, mock-ups and during actual system application.
- D. Pre-Installation Meeting:
 - 1. Conduct meeting one week prior to construction of mock-ups at Project Site.
 - 2. Meeting should be attended by Architect, Contractor, applicator of plaster system, and manufacturer's technical representative.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver manufactured materials in original packages, containers or bundles, bearing name of manufacturer and brand.
- B. Keep plaster and cementitious materials dry until ready for use.
 - 1. Keep off ground, under cover, and away from damp surfaces.
 - 2. Protect metal goods against rusting.

1.07 PROJECT CONDITIONS

- A. Exterior Plaster Work General:
 - 1. Before, during, and following application of plaster system, ambient and surface temperatures must remain above 40 degrees F for minimum period of 24 hours.
 - 2. Do not apply plaster when ambient temperature is below 40 degrees F.
 - 3. Inclement Weather:
 - a. Protect applied material from inclement weather until dry.
- B. Cold-Weather Requirements:
 - 1. Provide heat and protection, temporary or permanent, as required to protect each coat of plaster from freezing for at least 24 hours after application.
 - 2. Distribute heat uniformly to prevent concentration of heat on plaster near heat sources; provide deflection or protective screens.
- C. Warm Weather Requirements:
 - 1. Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial.
 - 2. Apply and cure plaster as required by climatic and project conditions to prevent dry out during cure period.

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- 3. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.
- D. Protect contiguous work from soiling, spattering, moisture deterioration and other harmful effects which might result from plastering.

1.08 WARRANTY

- A. Portland Cement Plaster with Acrylic Modified Finish Coat.
 - 1. Warranty Period:
 - a. Seven years from date of Substantial Completion
- B. Portland Cement Plaster with Acrylic Modified Finish Coat at Soffits.
 - 1. Eight years from date of Substantial Completion.
- C. Installer's Warranty:
 - 1. Two years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis-of-Design:
 - 1. Design for Plaster on Concrete Unit Masonry Walls:
 - a. Design of Portland cement plaster system is based upon Super Cement enhanced two coat system with OmegaFlex Acrylic-based finish coat as manufactured by Omega Products International, Inc., Corona, CA.
 - 2. Design for Plaster Soffits:
 - a. Design of Portland cement plaster system is based upon Super Cement enhanced two coat system with Omega Akrogold DEF System as manufactured by Omega Products International, Inc., Corona, CA.
- 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 Article 1.04 and as specified in Section 01 3300, for evaluation of proposed system.
 - 2. Copy of manufacturer's material warranty.

2.02 METAL LATH

- A. Welded Wire Lath at Soffits:
 - 1. Weight: 2.2 lb/yd²
 - a. Conforming to IAPMO UES 2017
 - 2. Finish:
 - a. Class 1 Galvanized Coating complying with ASTM A641
 - 3. Product and Manufacturer:
 - a. V Truss Wall & Ceiling Rib Lath as manufactured by Structa Wire Corp., Vancouver, B.C. Canada
- B. Tie and String Wire: 16-18 gage, galvanized.

- C. Lath Attachment Devices:
 - 1. Devices of material and type required by referenced standards and recommended by lath manufacturer for secure attachment of lath to framing members and of lath to lath.

2.03 PLASTER ACCESSORIES FOR PORTLAND CEMENT PLASTER

- A. General:
 - 1. Coordinate depth of accessories with thicknesses and number of coats required.
 - 2. Comply with material provisions of ASTM D 1784 and D 4216 for following:
 - a. Provide PVC products as manufactured by Plastic Components, Inc., or approved equal.
 - 3. Do not use metal accessories with Acrylic Modified Plaster finish except where PVC type is not available, subject to Architect's review and acceptance.
- B. Metal Corner Reinforcement:
 - 1. Expanded large mesh diamond mesh lath fabricated from zinc-alloy or welded wire mesh fabricated from 0.0475 inch diameter zinc-coated wire, specially formed to reinforce external corners of Portland cement plaster on exterior exposures while allowing full plaster encasement.
 - 2. Bullnose Corner Reinforcing:
 - a. Complying with ASTM A 653.
 - b. 7/8 inch radius Bullnose Corner Aid.
- C. Corner Beads:
 - 1. Small nose corner beads fabricated from PVC, with 2-1/2 inch to 2-3/4 inch flanges of PVC to allow full encasement by plaster.
- D. Casing Beads:
 - 1. Square-nose style of PVC, with 1-3/4 inch flange and removable protective tape.
- E. Control Joints:
 - 1. Prefabricated of PVC.
 - 2. One-Piece Type:
 - a. Folded pair of non-perforated screeds in M-shaped configuration, with 3-3/8 inch flanges.
 - 3. Two-Piece Type:
 - a. Pair of casing beads with back flanges formed to provide slip joint action, adjustable for joint widths from 1/8 inch to 5/8 inch.
 - 4. Cut lath and wire tie at control joints per ASTM C 1063.
- F. Weep Screed:
 - 1. Fabricated from PVC, with weep holes, 3-1/2 inch flange.

2.04 PORTLAND CEMENT PLASTER MATERIALS

- A. Portland Cement:
 - 1. Super Cement as manufactured by Omega Products International, Inc.
 - 2. Do not use plastic cement.
- B. Sand Aggregate:
 - 1. Conforming to ASTM C 897.
 - a. Clean, free from deleterious amounts of loam, clay, silt, soluble salts, organic matter and graded within following limits:

Percent Retained by Weight (plus or minus 2 percent)		
Retained on U.S. Standard Sieve	Minimum	Maximum
No.4		0
No.8	0	10
No. 16	10	40
No. 30	30	65
No. 50	70	90
No. 100	95	100

2.05 MISCELLANEOUS MATERIALS

- A. Water for Mixing and Finishing Plaster:
 - 1. Drinkable, free of substances capable of affecting plaster set or of damaging plaster, lath or accessories.
- B. Bonding Agent for Portland Cement Plaster:
 - 1. Conforming to ASTM C 932.
- C. Miscellaneous Aluminum Moldings and Trim:
 - 1. As manufactured by Fry Reglet Corp., or approved equal:
 - 2. Style type indicated on Drawings.
 - 3. Aluminum moldings:
 - a. Extruded alloy 6063-T5.
 - b. Provide with end caps.
 - 4. Factory Finish:
 - a. Factory applied prime coat, unless indicated otherwise.
 - 5. Install in accordance with manufacturer's recommendations.
 - 6. Field Finish:
 - a. Field paint in accordance with specified system in Section 09 9100.
 - b. Contractor's Option:
 - 1) Provide factory baked enamel finish coating in color as selected by Architect.

2.06 PORTLAND CEMENT PLASTER MIXES

- A. General:
 - 1. Comply with ASTM C 926 for Portland cement plaster base and finish coat mixes as applicable to plaster bases, materials and other requirements indicated.
- B. Portland Cement Plaster Base Coat Mixes and Compositions:
 - 1. Proportion materials for respective base coats:

- a. In parts by volume for cementitious materials.
- b. In parts by volume per sum of cementitious materials for aggregates, to comply with following requirements for each method of application and plaster base indicated.
- 2. Adjust mix proportions below within limits specified to attain workability.
- 3. Leveling Coat Work Over Concrete Unit Masonry:
 - a. Base coats as indicated.
 - 1) Brown Coat: Omega Fibered Super Cement, 3 to 5 parts sand.
- C. Provide Portland cement plaster with maximum allowable slump of 2-1/2 inches when tested in accordance with ASTM C 143.
 - 1. Take material for slump test from nozzle of plastering machine hose.
 - 2. Perform one slump test for each day of Portland cement plaster work.

2.07 PROPORTIONING AND MIXING

- A. Proportion and mix following manufacturer's recommendations.
- B. Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.
 - 1. Mechanically mix at Project Site.
 - a. Do not hand mix except where small amounts are needed, using less than one bag of plaster.
 - 2. Use measuring devices with known volume with successive batches proportions alike.

2.08 ACRYLIC-FINISH COAT OVER CONCRETE MASONRY

- A. Acrylic Modified Plaster:
 - 1. Basis of Design:
 - a. OmegaFlex System by Omega Products International, Inc.
- B. Crack Isolation Base:
 - 1. Polymer-Modified Cementitious Base Coat.
 - 2. Omega CI-Base
- C. Crack Isolation Mesh:

a.

- 1. Omega Reinforcing Mesh:
 - Alkali Resistant, Woven Fiber Mesh.
 - 1) CI-Mesh Standard Mesh (4.5oz).
 - 2) Omega Crack Isolation (CI) Mesh.
- D. Primer:
 - 1. Acrylic Priming Agent.
 - a. Omega RapidPrime.
- E. Acrylic-Based Finish Coat:
 - 1. OmegaFlex Fine, 100 percent acrylic finish, color and texture to match approved mock-up.
 - 2. Base Color: As scheduled.

2.09 PLASTER SOFFITS

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- A. Reinforcing Mesh:
 - 1. AkroFlex Meshes:
 - a. Alkali-resistant woven glass fiber fabrics specially designed to be used with AkroGold DEF System.
 - b. Standard Mesh (4.2 oz): For field locations.
 - c. Starter Mesh (4.2 oz.): For back wrapping, board joints, and detail work.
- B. Base Coat:
 - 1. Styroglue:
 - a. 100 percent polymer-based base coat and adhesive.
 - 1) Field mixed in 1:1 ratio by weight with Portland cement complying with ASTM C150.
- C. Primer:
 - 1. AkroFlex primer manufactured by Omega Products International.
- D. Finish:
 - 1. AkroFlex Fine, 100 percent acrylic-based finish manufactured by Omega Products International.]

PART 3 EXECUTION

3.01 EXAMINATION

- A. Prior to application of Portland cement system, review Site with plastering contractor to ensure that:
 - 1. Surface and Site conditions are ready to receive Work.
 - 2. Grounds and Blocking:
 - a. Verify that items within walls for other sections of Work have been installed.
- B. Substrates:
 - 1. Acceptable substrates must be securely fastened per applicable building code requirements.
 - 2. Acceptable substrates and adjacent materials must be dry, clean, and sound.
 - a. Substrate surface must be flat, free of fins or planar irregularities greater than 1/4 inch in10-feet.
- C. Flashings:
 - 1. Flashing around windows, at deck attachments, utility penetrations, roof lines, and kick-out flashing must be properly installed prior to application of Portland cement plaster system.
- D. Report unsatisfactory conditions to Contractor, Architect, and Owner.
 - 1. Do not proceed until unsatisfactory conditions have been corrected.
 - 2. Beginning of installation constitutes acceptance of existing conditions.

3.02 PREPARATION - GENERAL

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- A. Substrate:
 - 1. Clean substrate to which Portland cwement plaster system is to be applied.
 - Ensure that there are no foreign materials present.
 - 1) Including, but not necessarily limited to:

- a) Oil, dirt, dust, form release agents, efflorescence, paint, wax, water repellants, moisture, frost, or extended nails that may rupture water-resistive barrier.
- B. Surrounding Areas:
 - 1. Protect surfaces near Work of this Section from damage, disfiguration, and overspray.
 - a. Mask off dissimilar materials.

3.03 INSTALLATION OF LATH – GENERAL

- A. Portland Cement Plaster Lathing and Furring Installation Standard:
 - 1. Install lathing and furring materials indicated for Portland cement plaster to comply with ASTM C 1063.

3.04 METAL LATHING

- A. Welded Wire Metal Lath General:
 - 1. Provide appropriate type, configuration and weight of metal lath selected from materials indicated which comply with referenced lathing installation standards.
 - 2. Install expanded metal lath for following applications where plaster base coats are required:
 - a. Exterior Sheathed Soffit Surfaces:
 - 1) V Truss Wall and Ceiling Lath (Structa Rib Lath)
 - 3. Monolithic surfaces indicated to receive metal lath or not complying with requirements of referenced plaster application standards for characteristics which permit direct bond with plaster.
 - a. Provide self-furring metal lath.
 - 4. Apply metal lath over cement board sheathing with fasteners extending through sheathing into framing.
- B. Welded Wire Metal Lath Installation:
 - 1. Install lath complying with UES 2017 and following:
 - a. Apply lath to horizontal metal supports.
 - b. Maximum Support Spacing:
 - 1) In accordance with Table 3 of ASTM C 1063 for 3/8 inch, 3.4 lb/yd² rib metal lath.
 - c. Fastener Type and Spacing:
 - Comply with ASTM C1063 for rib metal lath, except that fasteners attach lath to framing supports at every second rib, at intersection of longitudinal wire and cross wire, or at any point along longitudinal wire that is welded to furring crimp.
 - a) Lap lath minimum of one mesh at sides.
 - 2) End laps:
 - a) Minimum of one mesh and occur over supports.
 - 3) Stagger ends of sheets between courses

3.05 PLASTERING ACCESSORIES

- A. General:
 - 1. Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated.

- Miter or cope accessories at corners:
 a. Install with tight joints and in alignment.
- 3. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.
- B. Accessory Attachment:
 - 1. Attach each flange at 18 inches on center maximum, or as necessary to hold plumb, for vertical accessories and to coincide with framing for horizontal accessories.
- C. Set accessories plumb, level and true to line, with tolerance of 1/8 inch in 10 feet.
- D. Install metal or PVC corner beads at external corners as required.
- E. Install casing beads at terminations of plaster work, except where plaster is indicated to pass through other work and be concealed by lapping work, and except where special screens, bases or frames act as casing beads including interior metal door frames.
 - 1. For exterior work, set casing beads 1/4 inch from abutting frames and other work, for application of sealant.
- F. Control and Expansion Joints:
 - 1. Install control and expansion joints at locations indicated, or where not indicated, at locations complying with following criteria and approved by Architect:
 - a. Where expansion or control joint occurs in surface of construction directly behind plaster membrane.
 - b. Where distance between control joints in Portland cement plastered surface exceeds 10 feet in either direction.
 - c. Where area within Portland cement panels exceed 100 square feet.
 - d. Where Portland cement plaster panel sizes or dimensions change.
 1) Extend joints full width or height of plaster membrane.
 - 2. Install prefabricated expansion joints of 2-piece design where shown as "Expansion Joint".
 - a. 1/8 inch joint width for exterior work.
- G. Separation Screeds:
 - 1. Install at intersections of two types of plaster, plaster and tile, and where indicated.

3.06 PREPARATION FOR PLASTERING

- A. Clean plaster bases and substrates for direct application of plaster, removing loose material and substances that may impair Work.
- B. Install temporary grounds and screeds to ensure accurate rodding of plaster to true surfaces
 - 1. Coordinate with scratch-coat work.
- C. Surface Conditioning of Concrete and Concrete Unit Masonry Surfaces:
 - 1. Immediately before plastering, dampen concrete and concrete unit masonry surfaces that are indicated for direct plaster application, except where bonding agent has been applied.

- 2. Determine and apply amount of moisture and degree of saturation that will result in optimum suction for plastering.
- 3. Bonding Agent:
 - a. Where bonding agent is required, apply to concrete and concrete unit masonry surfaces indicated for direct plaster application.
 - 1) Comply with manufacturer's written instructions for application.

3.07 PORTLAND CEMENT PLASTER APPLICATION – GENERAL

- A. Portland Cement Plaster Application Standard:
 - 1. Apply Portland cement plaster materials, compositions, and mixes to comply with ASTM C 926.
- B. Number of Coats:
 - 1. Apply Portland cement plaster, of composition indicated, to comply with following requirements:
 - a. Use two-coat work:
 - b. Total Plaster Thickness:
 - 1) Over Plywood or Glass Mat Gypsum Sheathing, and Metal Lath:
 - a) Nominal 7/8 inch thick, consisting of 3/8 inch scratch coat, 3/8 inch brown coat, and nominal 1/8 inch acrylic finish coat.
- C. Do not join or lap brown coat over joining or laps in scratch coat.
 - 1. Do not join or lap finish coat over joining or laps in brown coat.
 - 2. Joining or lap marks or differences in texture where scaffolding changes occur are not acceptable.
- D. Texture of Plaster Finishes:
 - 1. Except as otherwise indicated, apply finish coats as follows:
 - a. Acrylic-Based Finish:
 - 1) Smooth fine finish, matching approved mock-up.
- E. Curing:
 - 1. Provide proper continuous moist curing for Portland Cement plaster, including periods that extend over into holidays or weekends.
 - 2. Do not saturate or soak use fine fog spray.
 - a. Protect each coat from irregular or excessive drying.
 - b. Protect plaster from hot dry winds to eliminate "dry-outs" and see that required heat and ventilation are provided as necessary to eliminate "sweat-outs".
 - 3. Scratch Coat:
 - a. Moist cure for at least 48 hours.
 - 4. Brown Coat:
 - a. Moist cure for 48 hours, then allow to dry for 5 days before applying finish coat.
 - 5. Cure finish coat per manufacturer's instructions.

3.08 ACRYLIC MODIFIED FINISH COAT APPLICATION

A. Two Coat Application:

- 1. 1/16 inch minimum acrylic finish over 1/16 inch minimum basecoat over cured brown coat.
- 2. Use primer only when recommended by manufacturer.
- 3. Do not apply finish when ambient temperature is less than 40 degrees F and has been above 40 degrees for at least 24 hours prior.
- 4. Do not apply finish materials to Portland cement brown coats when sun is directly on wall surface and temperature is 75 degrees or more.
- 5. Protect plaster surfaces from precipitation prior to, during application, and through setting/curing period of finish coat.
- 6. Mix and apply trowelable aggregated acrylic finish system in strict accordance with manufacturer's printed instructions and recommendations of manufacturer's field representative.
- 7. Apply continuously and in one operation to entire wall area.
 - a. Maintain wet edge.
- 8. Bring finish minimum distance into sealant joints so that sealant material bonds to substrate but still covers edge of finish.
- 9. Apply finish so that there are no scaffold lines or other marks due to application.
- B. Application:
 - 1. Apply finish coat following manufacturer's directions, using stainless steel trowel and textured using conventional wood or plastic float to match approved sample.
 - 2. Leave finished base coat surface smooth and even and allowed to air cure for not less than 24 hours.
 - 3. Tolerance:
 - a. Install finished wall surface true, straight, and plumb to 1/8 inch in 10 feet.
 - 4. Allow finish to dry at least 24 hours.
 - a. Protect from weather, soiling, dust, and physical contact until fully dried.
- C. Curing:
 - 1. Cure acrylic finish coat per manufacturer's instructions.

3.09 ACRYLIC MODIFIED FINISH COAT APPLICATION OVER CONCRETE MASONRY

- A. Comply with requirements in Article 3.05 and following:.
 - 1. Apply crack isolation system to concrete masonry surfaces where indicated, in accordance with manufacturer's recommendations and instructions.
 - 2. Apply acrylic modified finish coat in accordance with requirements in Article 3.07 **3.08**.
- B. Installing Trim:
 - 1. Install square and drip edge track according to manufacturer's written instructions and specifications.

C. Installing Sheathing:

- 1. Install sheathing per local code and manufacturer's instructions.
- D. Installing Base Coat and Mesh:
 - 1. Openings and Penetrations:
 - a. Apply minimum 9.5 x 12-inch diagonal strips of starter mesh at corners of penetrations.

- b. Embed mesh in base coat while avoiding wrinkles.
- 2. Board Joints:
 - a. Apply minimum of 9.5-inch wide strips of mesh at board joints.
 - b. Embed mesh in base coat while avoiding wrinkles.
- 3. Substrate:
 - a. Once base coat from board joints, openings, and penetrations applications has dried, apply mesh to entire field.
 - 1) Use double layer of mesh at inside and outside corners.
 - a) Overlap minimum of 2-1/2 inches at mesh joints.
 - b) Embed mesh in base coat while avoiding wrinkles.
- 4. Drying:
 - a. Allow base coat to fully dry minimum of 24 hours before application of primer or finish.
- 5. Installing Primer:
 - a. Apply AkroFlex Primer with brush, roller, or sprayer.
 - b. Avoid puddling.
- E. Installing Finish Coat
 - 1. General:
 - a. Apply per approved finish product data sheet.
 - 2. Verification:
 - a. Verify desired color and texture.
 - b. Match approved sample and mock-up prior to installation.
- F. Primer:
 - 1. Acrylic Priming Agent.
 - a. Omega RapidPrime.
- G. Acrylic-Based Finish Coat:
 - 1. OmegaFlex Fine, 100 percent acrylic finish, color and texture to match approved mock-up.
 - 2. Base Color: As scheduled.

3.10 ACRYLIC MODIFIED FINISH COAT APPLICATION AT SOFFITS

- A. Comply with requirements in Article 3.05 and following:.
 - 1. Apply acrylic modified finish coat in accordance with requirements in Article 3.07 **3.08**.
- B. Installing Trim:
 - 1. Install square and drip edge track according to manufacturer's written instructions and specifications.
- C. Installing Sheathing:
 - 1. Install sheathing per local code and manufacturer's instructions.
- D. Installing Base Coat and Mesh:
 - 1. Openings and Penetrations:
 - a. Apply minimum 9.5 x 12-inch diagonal strips of starter mesh at corners of penetrations.
 - b. Embed mesh in base coat while avoiding wrinkles.
 - 2. Board Joints:

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- a. Apply minimum of 9.5-inch wide strips of mesh at board joints.
- b. Embed mesh in base coat while avoiding wrinkles.
- 3. Substrate:
 - a. Once base coat from board joints, openings, and penetrations applications has dried, apply mesh to entire field.
 - 1) Use double layer of mesh at inside and outside corners.
 - a) Overlap minimum of 2-1/2 inches at mesh joints.
 - b) Embed mesh in base coat while avoiding wrinkles.
- 4. Drying:
 - a. Allow base coat to fully dry minimum of 24 hours before application of primer or finish.
- 5. Installing Primer:
 - a. Apply AkroFlex Primer with brush, roller, or sprayer.
 - 1) Avoid puddling.
- E. Installing Finish Coat
 - 1. General:
 - a. Apply per approved finish product data sheet.
 - 2. Verification:
 - a. Verify desired color and texture.
 - b. Match approved sample and mock-up prior to installation.

3.11 CUTTING AND PATCHING

- A. Cut, patch, point-up and repair plaster as necessary to accommodate other work and to restore cracks dents and imperfections.
 - 1. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry-outs, efflorescence, sweat-outs and similar defects, and where bond to substrate has failed.
 - 2. Comply with requirements of Section 01 7329.
- B. Sand smooth troweled finishes lightly to remove trowel marks and arises.

3.12 CLEANING AND PROTECTION

- A. Remove temporary protection and enclosure of other work.
 - 1. Promptly remove plaster from door frames, windows, and other surfaces which are not to be plastered.
 - 2. Repair surfaces which have been stained, marred or otherwise damaged during plastering work.
 - 3. When plastering work is complete, remove unused materials, containers and equipment and clean floors of plaster debris.

END OF SECTION 09 2513

SECTION 09 9100

PAINTING

PART 1 GENERAL

1.

1.01 SUMMARY

- A. Section Includes:
 - 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 05 5500:	Metal Fabrications; shop prep and priming of galvanized and ferrous metal.
2.	Section 06 1053:	Miscellaneous Carpentry; preservative and fire retardant treatment
3.	Section 07 9200:	Joint Sealants
4.	Section 09 2900:	Gypsum Board
5.	Section 09 9600:	High Performance Coatings; painting of exterior metal railings and other exposed metal surfaces.

- 6. 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):
 - 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. 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 (NACE No. 3)

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.
- 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. Aluminum with shop-applied finish.
 - 1) Includes high performance coatings and anodizing.
 - b. Stainless steel, chromium plate, brass, bronze and similar finish materials.
 - 2. In general, following items will not require finishing unless specifically specified, scheduled, or indicated:
 - a. Walking Surfaces:
 - 1) Painted concrete curbs and pavement markings are specified in Section 32 1723.
 - b. Concealed Surfaces:
 - 1) Painting is not required on wall or ceiling surfaces in concealed areas and inaccessible areas, as applicable to Project.
 - c. Exterior concrete and masonry
 - d. Exterior aluminum and galvanized components of modular buildings.
 - 3. Portland Cement Plaster:
 - a. Unless direct otherwise by Architect at request of District, do not paint following:
 - 1) Integrally colored polymer-modified (acrylic) finish.
 - 2) Integrally colored Portland cement plaster (stucco) finish,
 - b. In lieu of painting, apply fog coat to integrally colored Portland cement plaster in accordance with plaster specification section.
 - c. When directed to paint Portland cement plaster, refer to Schedule of Exterior Paint Systems in this Section for appropriate paint system.
- 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.
 - 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.
 - Interpret references to brand names as establishing standard of quality.
 a. Such interpretation is not to be construed as limiting competition.
 - 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 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.

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- 1. Following completion of painting of each space or area, reinstall removed items.
- 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. Galvanized Surfaces:
 - 1. When indicated to be painted, clean galvanized surfaces with non-petroleumbased solvents complying with SSPC SP-1, so surface is free of oil and surface contaminants.
 - a. When necessary, brush blast surfaces complying with SSPC SP-7 to remove burrs and rough spots.
 - 2. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
 - 3. Spot prime field connections, welds, soldered joints, and burned and abraded portions.
 - 4. Sand or etch factory finished surfaces indicated to be repainted to increase adherence of finish coats.
- 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 approximately12 times anticipated movement and fall within range of 1/4 inch to 3/4 inch

3.03 PREVIOUSLY PAINTED EXISTING SURFACES

- A. General:
 - 1. Before painting or finishing over existing paint or finishes, paint small inconspicuous locations representing each condition to test for compatibility.
 - a. Should problems be encountered, do not proceed without Architect's instructions.
 - 2. Clean, prepare and repaint existing materials as indicated.
 - a. Sand rough areas and feather edge chipped paint.
 - b. Spackle and sand nail holes and like defects.
 - c. Wash existing painted surfaces with strong solution of biodegradable detergent and rinse with clean water.
 - d. Allow surfaces to dry thoroughly before paint is applied.
 - e. Clean and dust surfaces thoroughly and spot prime bare, abraded or touched-up areas.

- 3. Where existing paint is essentially sound, remove only loose and peeling paint, rust, oil, grease, dirt, and other substances which would affect bond or appearance of new paint.
- 4. Do not apply water-base paints over existing oil-based painted surfaces unless surface has been "scuff-sanded" and properly primed with paint manufacturer's recommended primer.
 - a. Test original surfaces to verify where oil-based paints were used.
- 5. Apply coatings conforming to respective schedules listed herein, except that pretreatments, sealers, fillers and prime coats need not be provided on surfaces where existing coatings are soundly adhered and in good condition.
- 6. Where patching occurs in painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch.
 - a. Provide additional coats until patch blends with adjacent surfaces.
 - b. Paint entire wall or ceiling surface to nearest outside or inside corner.

3.04 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.

3.05 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.
- 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, arrises, 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.

3.06 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 dropcloths 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.

3.07 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.

3.08 SCHEDULE OF EXTERIOR PAINT SYSTEMS

A. **Paint System Type 10:**

- 1. Type and Gloss: Enamel, Semi-Gloss, as indicated
- 2. Use Galvanized sheet metal flashing and trim.
 - a. Pretreatment:
 - 1) SC-ME-01 Krud Kutter Metal Clean & Etch
 - b. Primer (1st Coat):
 - 1) UGPR00 ULTRA-GRIP Premium, or
 - 2) ULGM00-WH ULTRASHIELD Interior/Exterior Galvanized Metal Primer
 - c. 2nd and 3rd Coats:
 - 1) ASHL50 ARISTOSHIELD Semi-Gloss Interior/Exterior.

3.09 SCHEDULE OF INTERIOR PAINT SYSTEMS

A. Paint System Type 29:

- 1. Type and Gloss: Eggshell
- 2. U se: Gypsum Board
 - a. Primer (1st Coat):
 - 1) VNPR00-1 VINYLASTIC Premium Interior Wall Sealer
 - b. 2nd and 3rd Coats:
 - 1) SWLL30 SPARTAWALL Low Odor, Zero VOC, Interior Eggshell

END OF SECTION 09 9100
SECTION 09 9600

HIGH PERFORMANCE COATINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Preparation, priming, and application of high performance field applied coatings, including but not necessarily limited to, following:
 - a. Architecturally Exposed Structural Steel (AESS) and related steel components
 - b. Exterior steel stairs and support framing
 - c. Exterior steel handrails and guardrails
- B. Related Sections:

1.	Section 05 0513:	Shop-Applied Coatings for Metal; factory applied high performance finishes on aluminum and coil-coated steel.
2.	Section 05 1200:	Structural Steel Framing; shop cleaning and priming of structural steel (AESS) and fireproofed steel specified to receive high performance coatings
3.	Section 05 3000:	Metal Decking
4.	Section 05 5000:	Metal Fabrications; shop cleaning and priming of miscellaneous metal specified to receive high performance coatings
5.	Section 09 9100:	Painting; ferrous metal not specified to be galvanized, or to receive high performance coating.

1.02 REFERENCES

- A. National Association of Architectural Metal Manufacturers (NAAMM):
 - 1. AMP 500 Metal Finishes Manual
- B. 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.
- C. South Coast Air Quality Management District (SCAQMD):
 - 1. Rule 1113 Architectural Coatings

1.03 SUBMITTALS

- A. Product Data:
 - 1. For each coating system specified; including 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 manufacturer's catalog number and coating material proposed for use.

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- 3. Manufacturer's Information:
 - a. Provide manufacturer's technical information, including 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. Applied finishes on steel, for color and finish.
 - 2. Provide minimum 4 by 8 inch pieces, and 8 inch lengths of larger sizes as required to show finished work.
- C. Qualification Data:
 - 1. For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience.
 - 2. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.04 QUALITY ASSURANCE

- A. Applicator Qualifications:
 - 1. Engage experienced applicator who has completed high performance coating system applications similar in material and extent to that indicated for this Project with record of successful in-service performance.
- B. Coating manufacturer's technical representative will perform following:
 - 1. Conduct periodic inspections of surface preparation and coating operations in shop and field, as required to obtain specified warranty.
 - 2. Coating contractor is responsible for contacting coating manufacturer's technical representative to arrange for required inspections.
 - 3. Notify Architect when Contractor fails to meet any portion of specification.

1.05 WARRANTIES

- A. Special Finish Warranty:
 - 1. Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period.
 - 2. Warranty does not include normal weathering.
 - 3. Warranty Period:
 - a. 10 years from date of Substantial Completion for Type A coating
 - b. 5 years from date of Substantial Completion for Type B coating system.
- B. Jointly warrant completed high performance coatings by respective coating manufacturer and coating applicator to meet weathering tests and performance requirements as specified.
 - 1. Coating applicator must apply for coating warranty at time of application.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis-of-Design Products:
 - 1. High Performance Coatings on steel are based on following systems as manufactured by The Carboline Company:
 - a. Type B: Organic Zinc-Rich EpoxylWaterborne Acrylic Polyurethane System.
- B. Alternate Basis-of-Design Products:
 - 1. High Performance Coatings on steel may be based on following systems as manufactured by Tnemec Company:
 - a. Type B: Zinc-Rich Aromatic UrethanelWaterborne Acrylic Polyurethane System
- C. 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 1600 and following:
 - 1. Submit items listed under Submittals and as specified in Section 01 3300, for evaluation of proposed system.
 - 2. Document that tests have been made for identical systems within ranges of specified performance standards and criteria for application to specified substrates.
 - 3. Acceptance is also subject to availability of acceptable color matching specified color.
 - 4. Copy of manufacturer's minimum 10 year finish and material warranty.

2.02 COATING MATERIALS – GENERAL

- A. Material Compatibility:
 - 1. Provide primers and finish coat materials that are compatible with one another and substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality:
 - 1. Provide manufacturer's highest grade of various high performance coatings specified; of uniform color throughout and color-fast.
 - 2. Materials not displaying manufacturer's product identification are not acceptable.
- C. Coating manufacturers and coating applicators are required to develop jointly methods and procedures for surface preparation, priming, and finish coating of materials.

2.03 HIGH-PERFORMANCE FIELD APPLIED COATING SYSTEMS

- A. High Performance Coating System Type B:
 - 1. High performance pigmented two component shop applied system consisting of organic zinc-rich epoxy primer and aliphatic acrylic polyurethane finish coat, as manufactured by Carboline Company, which meets or exceeds following performance provisions:
 - a. Resistant to abrasion, corrosion, and chemical exposure.
 - b. Repel surface dirt and contaminates.

- 2. Provide two coat system consisting of:
 - Primer Coat: Carbozinc 859 VOC Organic Zinc-Rich Epoxy Primer at 3.0 a. to 5.0 mils dry film thickness.
 - VOC Value: 95 g/l, as supplied/unthinned. 1)
 - Finish Coat: Carbothane 133 MC Aliphatic Acrylic-Polyester Polyurethane b. at 3.0 to 5.0 mils dry film thickness
 - VOC Value: 97 g/l, as supplied/unthinned. 1)
 - 2) Color: As selected by Architect.
- Apply Coating System Type B to: 3.
 - Architecturally Exposed Structural Steel (AESS) and related steel a. components exposed to view at completion of Work.
 - New decorative metal fence, including posts, pickets, and gates. b.
- Alternate High Performance Coating System Type B: Β.
 - High performance pigmented two component shop applied system consisting 1. of aromatic zinc-rich urethane primer and aliphatic acrylic polyurethane finish coat, as manufactured by Tnemec Company, which meets or exceeds following performance provisions:
 - Resistant to abrasion, corrosion, and chemical exposure. a.
 - Repel surface dirt and contaminates. b.
 - 2. Provide two coat system consisting of:
 - Primer Coat: Tnemec Hydro-Zinc Series 94-H₂O Zinc-Rich Aromatic a. Urethane Primer at 2.5 to 3.5 mils dry film thickness. VOC Value: 89 g/l, as supplied/unthinned. 1)
 - Finish Coat: Tnemec Endura-Shield Series 1081 Waterborne Acrylic
 - b. Polyurethane at 2.5 to 4.0 mils dry film thickness.
 - VOC Value: 88 g/l, as supplied/unthinned. 1)
 - Color: As scheduled. 2)

2.04 SOURCE QUALITY CONTROL

- Α. Source Limitations:
 - 1. Obtain primers for each coating system from same manufacturer as finish coats.

2.05 PERFORMANCE REQUIREMENTS

- Α. Provide coating systems suitable for shop and field application to steel.
- Β. Conform to applicable performance standards of following where referenced in specification:
 - National Association of Architectural Metal Manufacturers (NAAMM): "Metal 1. Finishes Manual"
 - 2. ASTM International (ASTM).
 - The Society for Protective Coatings (SSPC). 3.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- Surfaces to receive high performance coating must be free of grinding marks and Α. weld splatter.
 - Grind welds smooth. 1.

- B. Finish visible surfaces of exposed Work.
 - 1. Visible surfaces are defined as surfaces which will be exposed to view from exterior and in interior of completed building.
- C. Perform finishing after fabrication, forming, fitting, and welding have been completed.
- D. Finishes on Exposed Work:
 - 1. Be uniform in appearance
 - 2. Members are to match each other exactly throughout installed Work.
- E. Specified finishes establish type and quality required.
 - 1. Applied finishes are subject to Architect's acceptance.

3.02 SHOP CLEANING AND PRIMING OF EXPOSED STEEL

- A. Exposed Structural Steel:
 - 1. Comply with requirements of Sections 05 1200, 05 5000, and following:
 - a. Clean surfaces just prior to painting in accordance with SSPC-SP1 Solvent Cleaning to remove dirt and contaminants, followed by dry-blast cleaning in accordance with SSPC-SP 6 – Commercial Blast Cleaning.
 - 2. Fill small pit marks in otherwise smooth, sound surfaces with metallic compound, finish flush and smooth.
 - 3. Apply one coat of specified zinc-rich primer after fabrication and cleaning.
 - a. Apply two coats to surfaces that will be inaccessible after fabrication or after installation.

3.03 FIELD CLEANING AND PAINTING OF EXPOSED STEEL

- A. Surfaces to receive high performance coating must be free of grinding marks and weld splatter.
 - 1. Welds are to be ground smooth.
- B. Clean surfaces in accordance with SSPC-SP 2 or SP 3 as required and touch up primer as necessary.
- C. Field apply one coat of Type B high performance finish specified, to exposed surfaces of interior and exterior stair support framing, and exterior steel handrails and guardrails, in accordance with coating manufacturer's recommendations and instructions.

3.04 CLEANING

- A. Comply with Section 01 7423 and following:
 - 1. Clean in accordance with coating manufacturer's recommendations.
 - 2. Do not use materials or methods which may damage finishes or surrounding construction.

3.05 PROTECTION

A. Protect finished surfaces from damage until acceptance by Owner.

END OF SECTION 09 9600

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 and exterior room signs and directional signs
 - b. Geometric restrooms signs
 - c. Exterior directional signage other than accessible route sign.
 - 3. Engaging independent Braille reading consultant.
- B. Related Sections:

1.	Section 01 4100:	Regulatory Reguirements; current Code edition.

- 2. Section 05 5000: Metal Fabrications; accessible route sign framing.
 - Section 05 5800: Formed Metal Fabrication; accessible route sign cladding.
- 4. Section 32 1723: Pavement Markings; accessible parking striping

1.02 REFERENCES

3

- 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.

1.03 DEFINITIONS

- A. Accessible Route:
 - 1. Continuous unobstructed path that complies with 2019 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.

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- F. ISA:
 - 1. International Symbol of Accessibility
- 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 2019 CBC, Chapter 11B for following:
 1. Tactile character type and size.
 - 2. Finish and contrast.
 - 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 inst allation height and location.
 - 7. Parking lot entrance signs and accessible parking space identification signs.
 - 8. Circulation path signs leading from public right of ways, public transportation, and parking lots.
 - 9. Identify accessible building entrances with ISA per CBC Section 11B-216.6.
 - 10. 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.
 - 11. Tactile Exit Signs: Required per CBC Section 1013.4
 - 12. Signs indicating provision of special equipment for hearing impaired (i.e. TTY phone, volume control phones, and Assistive Listening Systems (ALS).

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.
 - 2. Provide tactile exit signage complying with CBC Section 1013.4.
- C. Independent Braille Reading Consultant:
 - 1. Engage independent Braille reading consultant to read and confirm that Braille on signage matches words on signs.
 - 2. Fabricate signs prior to Braille reading consultant reading signs.
 - a. Physical fingertip to sign verification is required.
 - b. Exceptions to this requirement are not permitted and will not be approved.
 - 3. When signs have been fabricated, they are to be sent to Braille reading consultant for verification and confirmation of compliance.
 - a. Signs not in compliance are to be brought to attention of District and Architect prior to refabrication.
 - b. Upon completion of review of non-compliant signs by District and Architect, those signs are to be refabricated at no additional cost to the District.
 - c. A final review of newly fabricated signs are to be verified and confirmed in compliance by the Braille reading consultant prior to installation.
 - 4. The Contractor is to provide a letter from the Braille reading consultant to the District and Architect that the review of all Braille signage has been performed per the requirements set in the specifications.
 - 5. Braille Reading Consultant:
 - a. Following agency has been approved by District:
 - 1) Wayfinder Family Services, 5300 Angeles Vista Blvd., Los Angeles, CA 90043.
 - 2) Contact:
 - a) Allison Burdett, 323-295-4555, aburdett@wayfinderfamily.org
 - b. Other Braille reading consultants may be used but will require prior approval by Architect before award of Contract.
 - 1) No consultants will be approved after award of Contract.

PART 2 PRODUCTS

2.01 GENERAL

- A. Letter Style:
 - 1. ITC Franklin Gothic Medium, unless indicated otherwise.

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2. Upper and Lower Case Letters.

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 Manufacturing Co., 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.
- 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 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 INFORMATIONAL SIGNS

- A. Exterior Directional Signage:
 - 1. Fabrication of accessible route (path of travel) sign and support framing is specified in Section 05 5000.
 - 2. Provide applied graphics complying with requirements of this Section.
 - a. Graphics to consist of reflective white vinyl for each sign as follows:
 - 1) Directional Arrows: Orientation as indicated on Drawings.
 - 2) ISA symbol.
- B. 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.

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 of door at entry or exit, and allow for reach within 0 inches of required clear floor space oer 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

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 following:
 - 1) Exterior concrete paving for walkways (sidewalks).
 - 2) Exterior ramps and footings.
- B. Related Sections:
 - 1. Section 01 4100: Regulatory Requirements; current Code edition.
 - 2. Section 01 4500: Quality Control; soil testing requirements
 - 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 31 1000: Site Clearing
 - 7. Section 32 0117: Asphalt Paving Repair
 - 8. Section 32 1100: Base Course
 - 9. Section 32 1313: Concrete Paving

1.02 REFERENCES

3.

- 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):
 - 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))
 - 2. ASTM D 2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
 - 3. 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):
 - 1. AASHTO Standard Specifications for Highway Materials and Methods of Sampling and Testing.
- 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.

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 Civil Engineer to make inspection of conditions.
 - 2. Should Civil Engineer determines 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 subbase, 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. 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:
 - 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.

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.
 - 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.
- 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

1.

- A. Imported Soil Materials:
 - 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. Base Material:
 - 1. Provide base material under asphalt pavements classified as Class II Aggregate Base as specified in Section 32 1100, or Section 26-1, 02B of SSPWC.

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) 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 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. 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.

3.05 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:
 - 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.

3.06 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. Walks:
 - 1) Shape surface of areas under walks to line, grade and crosssection, with finish surface not more than 0.10 foot above or below required subgrade elevation.
 - b. Pavements:
 - 1) Shape surface of areas under pavement to line, grade, and crosssection, with finish surface not more than 1/2 inch above or below required subgrade elevation.

3.07 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,

3.08 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.

3.09 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. Additioal 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.
 - Protection of existing materials to remain.
 a. Includes tree protection fences.
- B. Related Sections:

1.	Section 01 4100:	Regulatory Reguirements: current Code edition	on.
		riegalater, riegalienter, earrent eeue eare	••••

- 2. Section 01 5000: Temporary Facilities and Controls; barriers and
- 3. Section 01 5713: temporary controls.
 3. Section 01 5713: Temporary Erosion and Sediment Controls; maintenance of controls during site clearing operations.
 4. Section 31 0000: Earthwork; excavation, backfilling, and grading 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.

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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 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.

3.02 CLEANING

- A. Material Disposal:
 - 1. Remove cleared and grubbed materials, rubbish, debris, and other waste materials and legally dispose of them off Project Site.

END OF SECTION 31 1000

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 .
 - 2. Section 32 0117: Asphalt Pavement 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

1.02 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.
- B. Samples:
 - 1. Minimum 5 pound container of proposed base course material.

1.03 QUALITY ASSURANCE

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.

1.01 SUMMARY

- Α. Section Includes:
 - Exterior concrete paving for:
 - Walkways (sidewalks) a.
 - 2. Work Includes:
 - Formwork a.
 - b. Reinforcing
 - Portland cement C.
- **Related Sections** Β.
 - Section 01 5000: Temporary Facilities and Controls; barriers and 1. temporary controls. 2.
 - Joint Sealants: traffic sealants. Section 07 9200:
 - Earthwork; excavation, backfilling, and grading 3 Section 31 0000: requirements.
 - Base Course 4. Section 32 1100:
 - Asphalt Paving Section 32 1216: 5.
 - **Pavement Markings** 6. Section 32 1723:
 - Tactile Warning Surfacing 7. Section 32 1726:

1.02 REFERENCES

- **ASTM International (ASTM):** Α.
 - ASTM A 615 Standard Specification for Deformed and Plain Carbon-Steel 1. Bars for Concrete Reinforcement
 - ASTM A767 Standard Specification for Zinc-Coated (Galvanized) Steel Bars 2. for Concrete Reinforcement
 - ASTM A 1064 Standard Specification for Carbon-Steel Wire and Welded 3. Wire Reinforcement, Plain and Deformed, for Concrete
 - ASTM C31 Standard Practice for Making and Curing Concrete Test 4. Specimens in the Field
 - 5. ASTM C 33 – Standard Specification for Concrete Aggregates
 - ASTM C39 Standard Test Method for Compressive Strength of Cylindrical 6. Concrete Specimens.
 - ASTM C 94 Standard Specification for Ready-Mixed Concrete 7.
 - 8. ASTM C150 – Standard Specification for Portland Cement
 - ASTM C171 Standard Specification for Sheet Materials for Curing Concrete 9.
 - 10. ASTM C 260 Standard Specification for Air-Entraining Admixtures for Concrete
 - 11. ASTM C 494 Standard Specification for Chemical Admixtures for Concrete
 - 12. ASTM C 1059 Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete

- ASTM D 1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- 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. West Coast Lumber Inspection Bureau (WCLIB):
 - 1. Standard Grading Rules No. 17, 2004.
- E. 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 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixes: For each concrete pavement mix.
 - 1. 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.
- 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. 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.

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 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 40, 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.
 - 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

1.

- A. Moisture-Retaining Cover:
 - Conforming to ASTM C 171
 - a. Non-staining, reinforced, waterproof sheet.
- B. Water: Potable.

2.07 RELATED MATERIALS

- A. Control Joint Material:
 - 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. 3,250 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

1.

- A. Ready-Mixed Concrete:
 - 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: 1/4 inch wide at surface, tapered, with top edges rounded to 1/4 inch radius.
 - 3. Location: As shown on Drawings, but not more than 15 feet on center both ways.
 - a. Typical sidewalk joints shall be 5 feet on center, or as directed by Architect.
- C. Sawed Joinls: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades.
 - 1. 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.
 - 2. Prior approval of Architect is required for sawed joints.
- D. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with edging tool to specified radius.
 - 1. Repeat tooling of edges after applying surface finishes.
 - a. Eliminate tool marks on concrete surfaces.
 - 2. Radius: 1/4 inch.
- E. Construction Joints (CJ): 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.
 - 1. Continue reinforcement across construction joints unless indicated otherwise.
 - 2. Do not continue reinforcement through sides of strip paving unless indicated.
 - 3. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- F. Expansion Joints (EJ): Form expansion joints of preformed joint filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of 30 feet, unless indicated otherwise.
 - 2. Extend joint fillers full width and depth of joint, not less than 1/2 inch or more than 1 inch below finished surface where joint sealant is indicated.
 - a. Place top of joint filler flush with finished concrete surface when no joint sealant is required.
 - 3. Furnish joint fillers in one-piece lengths for full width being placed wherever possible.
 - a. Where more than one length is required, lace or clip joint filler sections together.

- b. Do not leave gaps between ends of joint filler units.
- 4. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap.
 - a. Remove protective cap after concrete has been placed on both sides of joint.
- 5. 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: Comply with requirements of Section 07 9200 and. following:
 - 1. Install sealant to depths recommended by sealant manufacturer but within the following general limitations, measured at center section of bead:
 - a. 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 neither more than 1/2 inch deep nor less than 3/8 inch deep.
 - 2. Tool joints to form smooth, uniform beads with slightly concave surfaces, with finished joints straight, uniform, smooth and neatly finished.
 - a. Remove excess sealant from adjacent surfaces of joint, leaving Work in neat, clean condition.
 - b. Do not use tooling agents unless recommended by sealant manufacturer.

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.
- C. Sawed Joinls:
 - 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 handspading, 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.
 - 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
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 fil1low spots.
 - 5. Refloat surface immediately to uniform granular texture.
 - 6. Portland cement concrete paving shall be stable, firm, and slip resistant and shall comply with CBC Sections 11B-302 and 11B-403.
- 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:
 - 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 lest, 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 compressivestrength 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.
- 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 compressivestrength 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 compressivestrength 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

SECTION 32 1726

TACTILE WARNING SURFACING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Cast In Place Detectable/Tactile Warning Surface Tiles (truncated domes) 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, 2019 California Building Code (CBC), Volumes 1 and 2, 2019 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 595 Colors Used in Government Procurement, current version.

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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/tactile 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/tactile warning surface tiles as certified by qualified independent testing laboratory.
 - 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/tactile warning surface tiles

1.04 QUALITY ASSURANCE

- A. Provide cast in place detectable/tactile warning surface tiles and accessories as produced by single manufacturer with minimum of three years experience in manufacturing of cast in place detectable/tactile warning surface tiles.
- B. Installer's Qualifications:
 - 1. Engage experienced installer certified in writing by detectable/tactile 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-inplace 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. Tactile Warning Surfacing:
 - 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 cutthrough 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 surfacing that differs from adjoining surfaces in resiliency or sound-oncane 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

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- B. Basis-of-Design Product:
 - 1. Vitrified Polymer Composite (VPC) Cast in Place Detectable/Tactile Warning Surface Tiles specified is based on Armor-Tile as manufactured by Engineered Plastics Inc.
 - 2. Vitrified Polymer Composite (VPC) Surface-Mounted Detectable/Tactile Warning Surface Tiles specified is based on Armor-Tile as manufactured by Engineered Plastics Inc.
 - 3. 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/tactile 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/tactile 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 to7 inches to permit solid placement of cast in place detectable/tactile 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.
- 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 nonmarring rubber mallet are specific to installation of cast-in-place detectable/tactile 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