

Project Manual

TERRACE VIEW ELEMENTARY SCHOOL TK MODULAR ADDITION

Colton Joint Unified School District
22731 Grand Terrace Road, Grand Terrace, Ca 92313

BID SET NOT FOR CONSTRUCTION



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AUGUST 2025

SGH Project No. 22-12107-00

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SECTION 01 10 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Work included.
- B. Contractor use of site.
- C. Work Sequence.

1.2 WORK INCLUDED

- A. The components of work included in the scope of this contract are for the Terrace View Elementary School TK Modular Addition consisting of the following: (Note: this list is non-exclusive. Contractor shall refer to all plans and specifications for all work required under this contract)
 - 1. Installation of (1) New 72'x40' modular classroom building (building by District) on concrete foundation (foundation by this contract).
 - 2. Site improvements associated with the installation of the building, walkways, ramps, play structure and playground.
 - 3. Accessibility upgrades to (1) existing adult all gender toilet room.

The attached "Scope Responsibility Matrix" (Attachment "A") is added to this Specifications Section 01 10 00 to clarify work by Contractor (under this Contract (Bid No 25-017FAC), Modular Manufacturer, and the District. All work identified or required in the Contract Documents is to be performed by the Contractor if not specified to be performed by the Modular Manufacturer, or the District. Refer to the Contract Documents for work associated with this project.

1.3 CONTRACTOR USE OF THE SITE

- A. Contractor shall have use of the site throughout the construction period as regulated by the Owner.
- B. Construction operations: Limited to area indicated on drawings.

1.4 WORK SEQUENCE

- A. Construct work in accordance with the Schedules and Reports, Section 01 31 01.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not Used)

END OF SECTION

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SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Changes in the Work.
- B. Schedule of Values.

1.2 CHANGES IN THE WORK

- A. Approval by Division of the State Architect (DSA) Required: Changes in the Work affecting Structural Safety, Access or Fire and Life Safety, will be submitted for DSA approval, using Form DSA-140 (Application for Approval of Construction Change Document - Category A) in accordance with CAC Section 4-338(c), prior to commencing the work described therein. Changes not affecting Structural Safety, Access or Fire and Life Safety (Form DSA-140 Application for Concurrence of Construction Change Document - Category B) will not be submitted for approval, only if required by DSA in writing.
- B. Minor Changes in the Work: Architect will issue through Construction Manager supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on Architect's instruction bulletin form, accompanied by (if necessary) an approved DSA-140/CCD.
- C. Proposal Requests
 - 1. Owner-Initiated Proposal Requests - Work Change Proposal Request (WCPR): Architect will issue through Construction Manager a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time, on AIA Document G709 or Architect's instruction bulletin form, referencing Form DSA-140/CCD. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - a. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - b. Within time specified in the General Conditions after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - 1) Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 2) Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 3) Include costs of labor and supervision directly attributable to the change.

- 4) Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - 5) Quotation Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail."
 - a) The CSI Forms mentioned above are available for purchase at www.csiresources.org
 2. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect through Construction Manager.
 - a. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - b. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - d. Include costs of labor and supervision directly attributable to the change.
 - e. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - f. Comply with requirements in Section 01 60 00 "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.
 - g. Proposal Request Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail."
 - 1) The CSI Forms mentioned above are available for purchase at www.csiresources.org
- D. Construction Change Directive to the Contractor:
 1. Construction Change Directive: Architect will issue through District Representative a Construction Change Directive on Architect's form, accompanied by DSA-approved Form DSA-140/CCD, and completed WCPR (Work Change Proposal Request). Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Copy will be issued to the Project Inspector.

**SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES**

- a. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
2. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - a. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract, using CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail."
 - 1) The CSI Forms mentioned above are available for purchase at www.csiresources.org.
- E. Change Orders Procedures: On Owner's approval of a completed Construction Change Directive, Architect will prepare and issue through District Representative a Change Order for signatures of the Owner and Contractor on AIA Document G701 or Architect's instruction bulletin form. Copies of signed Change Order will be distributed to Architect, IOR and Contractor, and submitted for Board Approval.
 1. Stipulated Price Change Order: Based on Contractor's Change Order Request as approved by Architect.
 2. Time and Material Change Orders: Submit itemized account and supporting data after completion of change within time limits indicated in Conditions of Contract. Architect will determine change allowable in Contract Price and Contract Time as provided in Contract Documents.
 3. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in Work.
 4. Refer to the General Conditions for additional requirements.
 5. Execution of Change Orders: Architect will issue Change Orders for signature of parties as provided in Conditions of the Contract.

1.3 SCHEDULE OF VALUES

- A. Submit printed schedule on AIA Forms G702 and G703 - Application and Certificate for Payment and Continuation Sheet. Contractor's standard form or electronic media printout will be considered, submit sample forms to Architect for approval.
- B. Submit application for progress payment in accordance with the General Conditions.
- C. Submit Schedule of Values in duplicate within 10 calendar days after Notice to Proceed for Architect's approval.
- D. Format: Utilize Table of Contents of this Project Manual. Identify each line item with number and title of the major Specification Section. Identify site mobilization and bonds and insurance. On projects of more than one building, list buildings separately. List mechanical,

**SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES**

electrical, plumbing and fire protection Work separately for each building and for site Work.

1. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed. Each sheet of the Schedule of Values shall be titled and numbered sequentially.

- a. Line Item Number
- b. Description of Item
- c. Quantity
- d. Unit of Measure
- e. Unit of Price
- f. Value of Line Item
- g. Line Item Value Request this month
- h. Line Item Value previously completed.
- i. At the bottom of each sheet, the Total Amount shall be tabulated and carried forward on each page and the TOTAL AMOUNT presented at the end.

- E. Break down the plumbing and mechanical portions of the work at a minimum into a rough, finish, including air balance and electrical portion.
- F. Break out rough grading, fine grading, and underground utilities.
- G. Include separate line items, showing amount of General Contractor's overhead and profit, bonds and insurance, supervision, and then remainder of general items.
- H. Revise schedule to list approved Change Orders, with each Application for Payment.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.0 NOT USED

END OF SECTION

SECTION 01 25 00 – SUBSTITUTIONS

PART 1 - GENERAL

1.1 SUMMARY

This section covers procedures for submittal of requests for substitution for materials specified in this project manual by proprietary names. The Conditions of the Contract and other sections of Division 1 apply to this section as fully as if repeated herein.

1.2 GENERAL REQUIREMENTS

- A. Whenever in the specification products are by reference standard, any product meeting the standards referenced may be used. Information on such products shall be submitted in accordance with Section 01 30 00, administrative requirements.
- B. The Contractor shall submit a written request for proposed substitutions, as permitted by Article 3 of the General Conditions. Proposed substitutions relating to a particular subcontract or trade shall be submitted at one time on the Contractor's letterhead, listing proposed items for indicated or specified items, and stating amounts for all variations in costs. If the Architect approves any proposed substitution, such approval will be set forth in a Change Order. No substitution will be considered 10 (Ten) days prior to the close of bid.
- C. Drawings and Specifications have been detailed in compliance with the ICBO Report for material specified. If a proposed substitute material is approved as an equal by the Architect, the Contractor will assume the responsibility for construction modifications and additional costs required by reason of this acceptance.
- D. Where materials or items of manufacturer are specified in groups and are made or furnished by one manufacturer, no substitution will be considered that is not made and/or furnished similarly by one manufacturer. Where the Contractor proposes to use a system of equipment other than that specified or detailed on the drawings the substitution shall be proposed as a complete system.

1.3 REQUIREMENTS FOR SUBMITTING SUBSTITUTIONS

- A. The Contractor shall submit with his written request for a proposed substitution all data substantiating his request as well as a "Certificate of Suitability" certifying that the proposed substitution is equal or better in all respects to that specified and that it will, in all respects perform the function for which it is intended. The Contractor shall include with his request all required samples. All written requests and data for proposed substitutions shall be submitted digitally via .pdf file.
- B. It shall be the responsibility of the Contractor to submit complete information to the Architect so that proper evaluation can be made. The burden of proof of equality of the substituted item shall be on the Contractor. Acceptance of such substitutions is entirely at the discretion of the Architect and Owner. All materials or items of manufacture, which the Contractor proposes to substitute for those specified, must be approved by the Architect before they may be ordered.

- C. The Architect will issue to the Contractor a list setting forth those items for which substitutions are approved. No substitution will be approved for any materials or item of manufacture called for in the Contract Documents which is not of equal quality and utility and which does not possess equal design or color characteristics to those of the specified material or item.
- D. If, in the opinion of the Architect or Owner, the proposed substitution is not equal or better in every respect to that so indicated or specified or was not submitted for approval in the manner outlined above, the Contractor shall furnish the specified materials.
- E. It shall be the responsibility of the Contractor, in proposing a substitution for any item herein specified, to inform all other trades, vendors, and subcontractors of effects said substitution will have upon their work or products. Failure to so notify shall require that the Contractor bear all costs arising from alterations in specified materials or methods necessary to complete the work in an approved and acceptable manner.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. General administrative requirements.
- B. Electronic document submittal service.
- C. Preconstruction meeting.
- D. Site mobilization meeting.
- E. Progress meetings.
- F. Construction progress schedule.
- G. Contractor's daily reports.
- H. Progress photographs.
- I. Coordination drawings.
- J. Submittals for review, information, and project closeout.
- K. Number of copies of submittals.
- L. Requests for Interpretation or Information (RFI) procedures.
- M. Submittal procedures.

1.2 RELATED REQUIREMENTS

- A. Section 01 32 00 - Construction Progress Schedule: Form, content, and administration of schedules.
- B. Section 01 60 00 - Product Requirements: General product requirements.
- C. Section 01 77 00 - Contract Closeout: Project record documents; operation and maintenance data; warranties and bonds.
- D. Technical Product Sections: Procedures for specific submittals specified in those Sections to be made at Contract closeout.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires responsive action by Construction Manager and Architect or other responsible design professional.
- B. Informational Submittals: Written information that does not require responsive action by Construction Manager and Architect or other responsible design professional.
- C. Unsolicited Submittals: Action or informational submittals not required by the Contract Documents or not requested by the reviewer. Unsolicited submittals may be returned with notation "not reviewed."

Product Data: Standard published information ("catalog cuts") and specially prepared data for the Work of the Contract, including standard illustrations, schedules, brochures, diagrams, performance charts, instructions and other information to illustrate a portion of the Work.

- D. Request for Interpretation or Information (RFI): A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as an RFI.
- E. Samples: Physical examples that demonstrate the materials, finishes, features, workmanship and other characteristics of a portion of the Work. Accepted samples shall serve as quality basis for evaluating the Work.
- F. Shop Drawings, Product Data and Samples: Instruments prepared and submitted by Contractor, for Contractor's benefit, to communicate to Architect the Contractor's understanding of the design intent, for review and comment by Architect on the conformance of the submitted information to the general intent of the design. Shop drawings, product data and samples are not Contract Documents.
- G. Shop Drawings: Drawings, diagrams, schedules and illustrations, with related notes, specially prepared for the Work of the Contract, to illustrate a portion of the Work.
- H. Other Submittals: Technical data, test reports, calculations, surveys, certifications, special warranties and guarantees, operation and maintenance data, extra stock and other submitted information and products shall not be considered as Contract Documents but shall be information from Contractor to Architect to illustrate a portion of the Work for confirmation of understanding of design intent.

1.4 PROJECT COORDINATOR

- A. Project Coordinator: Contractor.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for material delivery access, traffic, and parking facilities.
 - 1. Comply with requirements of Section 01 77 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 10 00 - Summary.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
 - 1. Requests for Interpretation or Information.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.

4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Substantial Completion.
11. Closeout submittals.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
 1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation or Information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
 2. Contractor and Architect are required to use this service.
 3. It is Contractor's responsibility to submit documents in allowable format.
 4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
 5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
 6. Unless specifically requested, paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
- B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.
- C. Submittal Service: The selected service is:

1. Bluebeam Software Inc.; Bluebeam Revu Studio: www.bluebeam.com.
2. Other Service acceptable to both District and Architect.
 - a. Direct email with PDF copies.
- D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.
 1. Representatives of District are scheduled and included in this training.
- E. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for District.

3.2 PRECONSTRUCTION MEETING

- A. District will schedule a meeting after Notice of Award.
- B. Attendance Required:
 1. District.
 2. Architect.
 3. Contractor.
- C. Agenda:
 1. Execution of District-Contractor Agreement.
 2. Submission of executed bonds and insurance certificates.
 3. Distribution of Contract Documents.
 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 5. Submission of initial Submittal schedule.
 6. Designation of personnel representing the parties to Contract and Architect.
 7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 8. Scheduling.
 9. Scheduling activities of a Geotechnical Engineer.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.

3.3 SITE MOBILIZATION MEETING

- A. Schedule meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 1. Contractor.
 2. District.

3. Architect.
 4. Contractor's superintendent.
 5. Major subcontractors.
 6. Inspector of Record.
- C. Agenda:
1. Distribute and discuss list of subcontractors and suppliers.
 2. Project Communication Procedures: Review requirements and administrative requirements for written and oral communications.
 - a. Review requirements and administrative procedures Contractor may wish to institute for identification and reporting purposes.
 3. Change Procedures: Review requirements and administrative procedures for Change Orders, Construction Change Directives, Architect's supplemental instructions and Contractor's Requests for Interpretation or Information.
 4. Use of premises by District and Contractor.
 - a. Site access restrictions, if any, and requirements to avoid disruption of operations at adjoining facilities or operations.
 - b. Construction Facilities and Temporary Utilities: Designate storage and staging areas, construction office areas; review temporary utility provisions; present District's requirements for use of premises.
 5. District's requirements.
 6. Construction facilities and controls provided by District.
 7. Temporary utilities provided by District.
 8. Survey and building layout.
 9. Security and housekeeping procedures.
 10. Schedules.
 - a. Distribute and discuss initial construction schedule and critical work sequencing of major elements of Work;
 - b. Include coordination of District Furnished / Contractor Installed (OFCl) products.
 11. Application for payment procedures.
 12. Procedures for testing.
 13. Procedures for maintaining record documents.
 14. Requirements for start-up of equipment.
 15. Inspection and acceptance of equipment put into service during construction period.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.

3.4 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-weekly intervals.
- B. Meeting Time and Location: As mutually agreed by District, Architect, and Contractor, at on-site location.
- C. Special Meetings: As necessary, Construction Manager may convene special meetings to discuss specific construction issues in detail and to plan specific activities.
 - 1. See Section 01 77 00 – Contract Closeout
- D. Attendance Required:
 - 1. Contractor.
 - 2. District.
 - 3. Architect.
 - 4. Contractor's superintendent.
 - 5. Major subcontractors.
- E. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems that impede, or will impede, planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of RFIs log and status of responses.
 - 7. Review of off-site fabrication and delivery schedules.
 - 8. Maintenance of progress schedule.
 - 9. Corrective measures to regain projected schedules.
 - a. Develop corrective measures and procedures, including but not necessarily limited to additional personnel loading to regain planned schedule.
 - 10. Planned progress during succeeding work period.
 - 11. Coordination of projected progress.
 - 12. Maintenance of quality and work standards.
 - 13. Effect of proposed changes on progress schedule and coordination.
 - 14. Other business relating to work.
- F. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, District, participants, and those affected by decisions made.

3.5 CONSTRUCTION PROGRESS SCHEDULE

- A. Contractor's Review: All schedules shall be reviewed and approved by Contractor prior to submission for Architect's and Construction Manager's review.
- B. Reviews by Architect and Construction Manager will be to ascertain the general status of construction and shall not be interpreted to establish or approve the means, methods, techniques and sequences of construction.

3.6 DAILY CONSTRUCTION REPORTS

- A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.
- B. In addition to transmitting electronically a copy to District and Architect, submit two printed copies at weekly intervals.
 - 1. Submit in format acceptable to District.
 - 2. Submit using required form, a sample of which is appended to this section.
- C. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
 - 1. Date.
 - 2. High and low temperatures, and general weather conditions.
 - 3. List of subcontractors at Project site.
 - 4. List of separate contractors at Project site.
 - 5. Approximate count of personnel at Project site.
 - a. Include a breakdown for supervisors, laborers, journeymen, equipment operators, and helpers.
 - 6. Major equipment at Project site.
 - 7. Material deliveries.
 - 8. Safety, environmental, or industrial relations incidents.
 - 9. Meetings and significant decisions.
 - 10. Unusual events (submit a separate special report).
 - 11. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
 - 12. Meter readings and similar recordings.
 - 13. Emergency procedures.
 - 14. Directives and requests of Authority(s) Having Jurisdiction (AHJ).
 - 15. Change Orders received and implemented.
 - 16. Testing and/or inspections performed.
 - 17. List of verbal instruction given by District and/or Architect.

18. Signature of Contractor's authorized representative.

3.7 PROGRESS PHOTOGRAPHS

- A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.
- B. Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.
- C. Photography Type: Digital; electronic files.
- D. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Architect.
- E. In addition to periodic, recurring views, take photographs of each of the following events:
 - 1. Completion of site clearing.
 - 2. Excavations in progress.
 - 3. Foundations in progress and upon completion.
 - 4. Structural framing in progress and upon completion.
 - 5. Enclosure of building, upon completion.
 - 6. Final completion, minimum of ten (10) photos.
- F. Take photographs as evidence of existing project conditions as follows:
 - 1. Interior views: each elevation, floor and ceilings prior to demolition.
 - 2. Exterior views: each elevation, roof and areas adjacent to construction limits.
- G. Views:
 - 1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
 - 2. Consult with Architect for instructions on views required.
 - 3. Provide factual presentation.
 - 4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
 - 5. Point of View Sketch: Provide sketch identifying point of view of each photograph.
- H. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
 - 1. Delivery Medium: Via email.
 - 2. File Naming: Include project identification, date and time of view, and view identification.
 - 3. Point of View Sketch: Include digital copy of point of view sketch with each electronic submittal; include point of view identification in each photo file name.

4. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.
5. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.

3.8 COORDINATION DRAWINGS

- A. Provide information required by Project Coordinator for preparation of coordination drawings.
- B. Review drawings prior to submission to Architect.

3.9 REQUESTS FOR INTERPRETATION OR INFORMATION (RFI)

- A. Definition: A request seeking one of the following:
 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in the Contract Documents.
 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 2. Prepare in a format and with content acceptable to District.
 - a. Use the form provided in this project manual.
 - b. Use CSI/CSC Form 13.2A - Request for Interpretation.
 3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 - a. Submit RFIs from subcontractors and material suppliers through, be reviewed by and be attached to an RFI prepared, signed and submitted by Contractor.
 - 1) RFIs from subcontractors and material suppliers are to be:

- (a) Reviewed by Contractor.
 - (b) Corrected and rewritten to clarify as required by Contractor.
 - (c) Placed on the proper form, then signed, and submitted by Contractor.
 - (d) RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.
 - 2) RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.
 - b. Review all subcontractor- and supplier-initiated RFIs and take actions to resolve issues of coordination, sequencing and layout of the Work.
 - 1) RFIs submitted to request clarification of issues related to means, methods, techniques and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without response.
 - (a) Such issues are solely the Contractor's responsibility.
 - 2) Contractor is responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.
 - c. Unacceptable Uses for RFIs: Do not use RFIs to request the following: Approval of submittals (use procedures specified elsewhere in this section).
 - d. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
 - e. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
 - f. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
- 2. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
 - 3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
 - a. The District reserves the right to assess the Contractor for the costs (ontime-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
- 1. Official Project name and number, and any additional required identifiers established in Contract Documents.

2. District's, Architect's, and Contractor's names.
3. Discrete and consecutive RFI number, and descriptive subject/title.
4. Issue date, and requested reply date.
5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 - a. Inability to determine from the Contract Documents the exact material, process, or system to be installed;
 - b. Or when the elements of construction are required to occupy the same space (interference);
 - c. Or when an item of Work is described differently at more than one place in the Contract Documents.
7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
 - a. In all cases, furnish all information required for the Architect to analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to proceed for RFIs issued to request clarification of issues related to:
 - 1) Means, methods, techniques and sequences of construction, for example
 - 2) Pipe and duct routing, clearances;
 - 3) Specific locations of Work shown diagrammatically;
 - 4) Apparent interferences and similar items.
 - 5) If information included with this type RFI by the Contractor is insufficient, the RFI will be returned unanswered.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
 1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 2. Note dates of when each request is made, and when a response is received.
 3. Highlight items requiring priority or expedited response.
 4. Highlight items for which a timely response has not been received to date.
 5. Identify and include improper or frivolous RFIs.
- H. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.

1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to District.
 1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
 3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
 4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.10 SUBMITTAL SCHEDULE

- A. Submit to Architect for review a schedule for submittals in tabular format.
 1. Submit at the same time as the preliminary schedule.
 - a. Submit initial Submittals Schedule within 14 days of date of Notice of Award of construction.
 - b. After review and return by Architect, resubmit Submittals Schedule within 10 days and thereafter submit updated Submittals Schedules at each Construction Progress Meeting.
 - c. Submit one copy each to Owner and Architect.
 2. Coordinate with Contractor's construction schedule and schedule of values.
 3. Format schedule to allow tracking of status of submittals throughout duration of construction.
 - a. Prepare schedules in Gantt format using software at Contractor's option, providing clear indication of sequencing and scheduling of Work, for determination of "critical path" of construction progress.
 - 1) Submittals shall be connected to the related construction element by a graphically indicated critical path on the same page.
 - 2) Present schedules using opaque reproductions on substantial paper, with sheet size a multiple of 8-1/2 by 11 inches and large enough to clearly read characters.
 4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.

5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.

3.11 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 1. Product data.
 2. Shop drawings.
 3. Samples for selection.
 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.12 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 1. Design data.
 2. Certificates.
 3. Test reports.
 4. Inspection reports.
 5. Manufacturer's instructions.
 6. Manufacturer's field reports.
 7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for District.

3.13 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 77 00 – Contract Closeout.
 1. Project record documents.
 2. Operation and maintenance data.
 - a. Include operation and maintenance data submittals in Submittals Schedule specified above.

- b. Provide space for review action stamps and, if required by governing authorities having jurisdiction, license seal of design Professional, if applicable.
- 3. Warranties.
- 4. Bonds.
- 5. Other types as indicated.
- D. Submit for District's benefit during and after project completion.

3.14 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format with renderable text; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Small Size Sheets, Not Larger Than 11 by 17 inch: Submit one copy; the Contractor shall make his own copies from original returned by the Architect after making his own file copy.
- C. Extra Copies at Project Closeout: See Section 01 77 00.
- D. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. After review, produce duplicates.
 - 2. Retained samples will not be returned to Contractor unless specifically so stated.
 - 3. Quantity:
 - a. Submit minimum of six (6) samples of each of color, texture and pattern.
 - b. Submit one item only of actual assembly or product.
 - c. Unless otherwise noted, full-size and complete samples will be returned and may be incorporated into field mock-ups and the Work.

3.15 SUBMITTAL PROCEDURES

- A. General Requirements:
 - 1. Use a separate transmittal for each item.
 - 2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
 - 3. Transmit using approved form.
 - 4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
 - 5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
 - a. *For example:*
 - 1) 1.0_09 21 16 - First submittal for Section 09 21 16 - Gypsum Board Assemblies.

- 2) 2.0_09 21 16 - Second submittal for Section 09 21 16 - Gypsum Board Assemblies.
 - b. Use same number for resubmittals as original submittal, preceded by a number indicating sequential resubmittal. For example:
 - 1) 2.1_09 21 16 - Resubmission of second submittal for Section 09 21 16 - Gypsum Board Assemblies.
 - 2) 2.2_09 21 16 - Second resubmission of second submittal for Section 09 21 16 - Gypsum Board Assemblies.
6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
- a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
 - b. Field measurements have been determined and verified.
 - c. Conformance with requirements of Contract Drawings and Specifications is confirmed.
 - d. Catalog numbers and similar data are correct.
 - e. Work being performed by various subcontractors and trades is coordinated.
 - f. Field construction criteria have been verified, including confirmation that information submitted has been coordinated with the work being performed by others for District and actual site conditions.
 - g. All deviations from requirements of Drawings and Specifications have been identified and noted.
7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
- a. Send submittals in electronic format via email to Architect.
 - b. Upload submittals in electronic form to Electronic Document Submittal Service website.
8. Schedule submittals to expedite the Project, and coordinate submission of related items.
- a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
 - b. For sequential reviews involving Architect's consultants, District, or another affected party, allow an additional 7 days.
9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
- a. Changes in the Work shall not be authorized by submittals review actions.
 - b. No review action, implicit or explicit, shall be interpreted to authorized changes in the Work.
 - c. Changes shall only be authorized by separate written Contract

Change Order or Construction Change Directive, in accordance with the Conditions of the Contract and Section 01 20 00 - Price and Payment Procedures.

10. Provide space for Contractor and Architect review stamps.
 11. When revised for resubmission, identify all changes made since previous submission.
 12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
 13. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
 14. Submittals not requested will be recognized, but will be returned without comment.
- B. Product Data Procedures:
1. Submit only information required by individual specification sections.
 2. Collect required information into a single submittal.
 3. Submit concurrently with related shop drawing submittal.
 4. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 2. Use of reproductions of the Contract Documents in digital data form to create shop drawings is only permitted as defined in Division 01 and individual product sections.
 3. Coordination: Show all field dimensions and relationships to adjacent or critical features of Work.
 4. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
1. Transmit related items together as single package.
 2. Samples will be reviewed for aesthetic, color, or finish selection.
 3. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
 4. Color Selection Samples: Architect will review and select colors for Project only after all colors are received, so that colors may be properly coordinated.
 5. Copies: Submit actual samples. Photographic or printed reproductions will not be accepted.
 6. Review of Field Samples: Review by Architect of field samples will be made for the following example products, as applicable, if not otherwise required and if requested by Contractor.
 - a. Concrete wall finishes and detailing (edges, corners and reveals).
 - b. Concrete paving colors and textures.

- c. Gypsum board textures and finishes.
- d. Field-applied paint colors and finishes.

3.16 SUBMITTAL REVIEW

- A. Submittals for Review: Architect will review each submittal, and/or take other appropriate action.
- B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
- C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
 - 1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.
- D. Architect's and consultants' actions on items submitted for review:
 - 1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. "No Exception Taken", or language with same legal meaning.
 - b. "Make Corrections Noted" resubmittal not required, or language with same legal meaning.
 - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
 - c. "Make Corrections Noted, Resubmit for Record", or language with same legal meaning.
 - 1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
 - 2) Non-responsive resubmittals may be rejected.
 - 2. Not Authorizing fabrication, delivery, and installation:
 - a. "Revise and Resubmit".
 - 1) Resubmit revised item, with review notations acknowledged and incorporated.
 - 2) Non-responsive resubmittals may be rejected.
 - b. "Rejected".
 - 1) Submit item complying with requirements of Contract Documents.
- E. Architect's and consultants' actions on items submitted for information:
 - 1. Items for which no action was taken:
 - a. "Received" - to notify the Contractor that the submittal has been received for record only.
 - 2. Items for which action was taken:
 - a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

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SECTION 01 31 00 - COORDINATION AND MEETINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Coordination
- B. Pre-construction conference
- C. Progress meetings
- D. Pre-installation conferences

1.2 COORDINATION

- A. Coordinate scheduling, submittals and work of the various sections of the specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Prior to commencement of a particular type or kind of work, examine relevant information, contract documents and subsequent data issued to the project.
- C. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to and placing in service, such equipment.
- D. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on drawings. Follow routing shown for pipes, ducts and conduit as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, maintenance, and repairs.
- E. In finished areas, except as otherwise indicated, conceal pipes, ducts and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. In locations where several elements of mechanical and electrical work must be sequenced and positioned with precision in order to fit into available space, prepare coordination drawings showing the actual conditions required for the installation. Prepare coordination drawings prior to purchasing, fabricating or installing elements required to be coordinated.
- G. Closing up of walls, partitions or furred spaces, backfilling and other covering up operations shall not proceed until all enclosed or covered work and inspections have been completed. Verify before proceeding.
- H. Coordinate completion and clean-up of work of separate sections in preparation for substantial completion (and for portions of work designated for Owner's full and/or partial occupancy).
- I. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with contract documents to minimize disruption of Owner's activities.
- J. Coordinate all utility company work in accordance with the General Conditions.

1.3 PRE-CONSTRUCTION CONFERENCE

- A. Contractor will schedule a conference immediately after receipt of fully executed contract documents prior to project mobilization.

- B. Mandatory Attendance: Contractor, Owner, Owner's Testing Laboratory Representative, Architect, Sub Contractor/s and Sub Contractor's Job Superintendent.
- C. Optional Attendance: Architect's consultants, subcontractors and utility company representatives.
- D. Owner will preside at conference. Architect shall record meeting minutes and distribute copies through the Owner.
- E. Agenda:
 - 1. Execution of Owner-Contractor Agreement
 - 2. Issue Notice to Proceed
 - 3. Submission of executed bonds and insurance certificates
 - 4. Distribution of Contract Document
 - 5. Submission of list of Subcontractors, list of products, schedule of values and progress schedule
 - 6. Designation of responsible personnel representing the parties
 - 7. Procedures and processing of field decision, submittals, substitutions, applications for payments, proposal request, change orders and contract closeout procedures
 - 8. Scheduling

1.4 PROGRESS MEETINGS

- A. The Contractor will schedule and administer meetings throughout the progress of the work as needed.
- B. The Contractor will make arrangements for meetings, prepare agenda and preside at meetings. The Contractor will record minutes and distribute copies.
- C. Attendance required: Owner, Architect, Prime Contractor and appropriate Sub-Contractors (when requested by the General Contractor, Architect or Owner). Sub-Contractors are welcome to attend at any time; however, their attendance is mandatory only when requested by the Contractor, Architect or Owner.
- D. Agenda:
 - 1. Review minutes of previous meetings (Field Reports).
 - 2. Review work progress.
 - 3. Field observations, problems, and decisions
 - 4. Identification of problems which impede planned progress
 - 5. Review of submittals, schedule, and status of submittals
 - 6. Review of off-site fabrication and delivery schedules
 - 7. Maintenance of progress schedule
 - 8. Corrective measures to regain projected schedules
 - 9. Planned progress during succeeding work period

10. Coordination of projected progress
11. Maintenance of quality and work standards
12. Effect of proposed changes on progress schedule and coordination
13. Other business relating to work

1.5 PRE-INSTALLATION CONFERENCE

- A. When required in individual specification section, convene a pre-installation conference prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect at least 5 days in advance of meeting date.
- D. Prepare agenda, preside at conference, record minutes and distribute copies within two days after conference to participants.
- E. Review conditions of installation, preparation and installation procedures and coordination with related work.

1.7 FOREMAN'S MEETINGS

- A. The Contractor will schedule and administer meetings throughout progress of the work at weekly intervals as needed.
- B. The Contractor will make arrangements for meetings, prepare agenda and preside at meetings. The Contractor will record minutes and distribute copies.
- C. Attendance required: Inspector (if applicable), Contractor, appropriate Sub Contractors (when requested by the Architect, or Owner). Sub-Contractors are welcome to attend at any time; however, their attendance is mandatory only when requested by the Contractor, Architect or Owner.
- D. Agenda:
 1. Review minutes of previous meetings (Field Reports).
 2. Review work progress.
 3. Field observations, problems, and decisions
 4. Identification of problems which impede planned progress
 5. Review of submittals, schedule, and status of submittals
 6. Review of off-site fabrication and delivery schedules
 7. Contractor to submit 3 week look ahead schedule
 8. Corrective measures to regain projected schedules
 9. Planned progress during succeeding work period
 10. Coordination of projected progress

11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to work

END OF SECTION

SECTION 01 31 01 - SCHEDULES AND REPORTS

PART 1 - GENERAL

1.1 SUMMARY

- A. The work includes the preparation and submission of the schedules and reports specified herein, including the up-to-date maintenance thereof as required. The Conditions of the Contract and the other sections of Division 1 apply to this section as fully as if repeated herein.

1.2 CONSTRUCTION SCHEDULE

- A. The following schedule is used for purposes of establishing a preliminary project schedule for bidding purposes.

Bid Invitation:	TBD
Pre Bid Job Walk:	TBD
Pre-Bid RFI's Due:	TBD
Issue Addendum / Clarifications:	TBD
Receive Bids:	TBD
Bid Review:	TBD
Contract Award:	TBD
Contractor to pull permits:	TBD
Pre-Construction Meeting:	TBD
Construction:	TBD
Submittal Deadline:	TBD
Occupancy:	TBD
Project Contingency:	TBD

- B. Contractor shall include in their bid package, an acknowledgement of the proposed project schedule and any deviations / changes determined to be unobtainable or unreasonable.
- C. Immediately upon being awarded the Contract and before request for a partial payment, the Contractor shall prepare and submit to the Architect a construction progress schedule. The schedule shall be prepared in chart form according to the Critical Path Method (CPM) with the dates for beginning and completion of each trade and activity included. Computer prepared CPM charts are acceptable. The schedule shall conform to the working time and the time of completion established under the terms of the Contract and shall be subject to modification by and approval of the Owner. When, in the opinion of the Owner, it becomes necessary to accelerate the work, the Contractor, when so ordered, shall modify the schedule to conform to such requirements.
- D. The Construction Schedule shall be continuously updated and, if necessary, redrawn and submitted simultaneously with the application for progress payments. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.
- E. A copy of the most recent updated Construction Schedule shall be posted in the Contractor's job office, and copies of all out-of-date schedules shall be kept at the job office at all times for perusal by the Owner.

1.3 SUBMITTAL SCHEDULE

- A. The Contractor shall also furnish a separate schedule along with the Construction Schedule specified above, showing the proposed dates for submittal of all samples, shop drawings and product data.
- B. Submit two copies of the submittal schedule to the Architect.

1.4 SCHEDULE OF VALUES

- A. Immediately upon being awarded the Contract, and before request for payment, prepare and submit to the Architect a Schedule of Values allocated to the various portions of the work. This Schedule of Values, unless objected to by the Architect, shall be used only as the basis for the Contractor's Applications for Payment.
- B. The schedule shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress payments during construction. Follow the table of contents of this Project Manual as the format for listing component items. For each major line item list sub-values of major products or operations under the item, where applicable.
- C. Each item shall include a directly proportional amount of the Contractors overhead and profit.
- D. For items on which progress payments will be requested for stored materials, break down the value into (1) the cost of the materials, delivered and unloaded, with taxes paid and (2) the total installed value.
- E. The sum of all values listed in the schedule shall equal the total Contract sum.

1.5 MEETING MINUTES

- A. The contractor shall be required to document and prepare all construction meeting minutes. Minutes shall be prepared in a timely manner and be issued to all attendees within 24 hours after meeting date. Contractor shall be responsible for setting meetings and scheduling time and location.

END OF SECTION

SECTION 01 31 13 - PROJECT COORDINATION

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDE

- A. Prime Contractor will coordinate the work of the Sub-Contractors for the project.
- B. Each Contractor shall:
 - 1. Coordinate work of their own employees and sub-contractors.
 - 2. Expedite their work to assure compliance with schedules.
 - 3. Coordinate their work with that of other Sub-Contractors and work by Owner.
 - 4. Comply with orders and instructions of the Architect, and Owner, through the Architect.

1.2 RELATED REQUIREMENTS

- A. Section 01 31 01 – Schedules and Reports
- B. Section 01 50 00 – Temporary Facilities

1.3 CONSTRUCTION ORGANIZATION AND START-UP

- A. The Prime Contractor shall establish on-site lines of authority and communications:
 - 1. Schedule & conduct pre-construction meeting and progress meetings as required.
 - 2. Establish procedures for intra-project communications:
 - a. Submittals
 - b. Schedules
 - c. Resolution of conflicts
 - 3. Interpret contract documents:
 - a. Consult with the Architect to obtain interpretation
 - b. Assist in resolution of questions or conflicts which may arise
 - c. Transmit written interpretations to prime contractors and to other concerned parties
 - 4. Assist in obtaining permits and approvals:
 - a. Building permits and special permits required for work or for temporary facilities
 - b. Verify that contractors and sub-contractors have obtained inspections for work and for temporary facilities
 - 5. Control the use of the site:
 - a. Allocate space for each contractor's use for field offices, sheds, work and work storage areas
 - b. Establish access, traffic & parking allocations and regulations
 - c. Monitor use of site during construction

1.4 PRIME CONTRACTOR DUTIES

- A. Construction Schedule:
 - 1. Prepare a detailed schedule of basic operations to be reviewed by the owner:
 - a. Prime contractor shall prepare sub-schedules to comply with critical phases
 - b. Recommend to Owner adjustments in schedule to meet required completion dates
 - c. Adjust schedules as required
 - d. Document changes in schedule and submit to Owner with recommendations for changes (if any).
- B. Process Shop Drawings, Product Data and Samples.
- C. Monitor the use of temporary utilities:
 - 1. Verify that adequate services are provided and maintained.
 - 2. Coordinate use of Owner's facilities.
- D. Prime Contractor shall preform periodic cleaning:
 - 1. Enforce compliance with specifications.
- E. Arrange for delivery of Owner-furnished products.
- F. Changes and substitutions:
 - 1. Recommend necessary or desirable changes to Owner and to Architect if required.
 - 2. Changes and substitutions; submit recommendations to Owner and to Architect.
 - 3. Assist Architect in negotiating change orders from sub contractors.
- G. Payments:
 - 1. Implement procedures for review and processing of Sub-Contractor's payment applications for progress payments and for final payments:
 - a. Review each application for payment, submit recommendations to Architect.
- H. Maintain reports and records at the job site available to the Architect and the Owner:
 - 1. Daily log of the progress of work.
 - 2. Records:
 - a. Contracts
 - b. Purchase orders
 - c. Applicable handbooks, codes and standards
 - 3. Obtain information from sub-contractors and maintain file of record documents.

1.5 PRIME CONTRACTOR CLOSE-OUT DUTIES

- A. Mechanical and electrical equipment start-up:
 - 1. Coordinate check-out of utilities, operational systems and equipment.

2. Record dates of start of operation of systems and equipment.
 3. Submit to Owner written notice of beginning of warranty period for equipment put into service.
- B. At completion of work of each contract, conduct inspection to assure that:
1. Specified cleaning has been completed.
 2. Temporary facilities (if any), tools and equipment have been completely removed from the site.
- C. Substantial completion:
1. Conduct an inspection to confirm or supplement Sub-contractor's list of work to be completed or corrected.
 2. Assist Architect with inspection.
 3. Supervise correction and completion of work as established in Certificate of Substantial Completion.
- D. When Owner occupies a portion of the Project prior to final completion, coordinate established responsibilities of sub-contractor with Owner.
- E. Final Completion:
1. When Sub-Contractor determines that work is finally complete, conduct pre-inspection to verify completion of work.
 2. Assist Architect in Final Inspection.
- F. Administration of contract closeout:
1. Submit final submittals for O&M manuals and warranties.
 2. Transmit to Architect with recommendations for action.

END OF SECTION

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SECTION 01 31 19 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section covers the requirements for a pre-construction meeting, progress meetings, specially called meetings and post-construction meeting. The Conditions of the Contract and the other sections of Division 1 apply to this section as fully as if repeated herein.

1.2 CONTRACTOR'S RESPONSIBILITIES

- A. Prepare agenda, notify participants and make physical arrangements for all meetings.
- B. Record minutes, including all significant proceedings and decisions for each meeting. Reproduce and distribute copies of minutes within 5 days after each meeting. Provide copies to the Architect, all other participants in the meeting and all other parties affected by decisions made at the meeting.

1.3 PRE-CONSTRUCTION MEETING

- A. Prior to issuance of notice to proceed, a pre-construction meeting will be held at a time and location designated by the Architect.
- B. Attendance: The meeting shall be attended by the Owner's representative, the Owner's Inspector, the Architect and his professional consultants, the Contractor and his superintendent, all major sub-contractors and other persons designated by the Owner.
- C. Agenda: The agenda for the meeting shall include the following items as a minimum.
 - 1. Distribution and discussion of the construction schedule including all critical work sequencing.
 - 2. Designation of persons authorized to represent and sign documents for the Owner, Architect and Contractor, with examples of official signature of each.
 - 3. Procedures and forms for processing submittals, field decisions, proposal requests, change orders, applications for payment and revised progress schedules.
 - 4. Procedures for maintaining record documents.
 - 5. Contractor's use of premises, including location of office, work and storage areas.
 - 6. Temporary barricades, utilities, sanitary facilities, signs and other temporary facilities required.
 - 7. Safety and first-aid procedures, including designation of Contractor's safety officer.
 - 8. Security procedures.
 - 9. Housekeeping procedures.
 - 10. Communication procedures between parties.
 - 11. List names, addresses and telephone numbers of those persons authorized to act for the Contractor in emergencies.
 - 12. Construction permit requirements, procedures and posting.
 - 13. Testing laboratory or agency and testing procedures.

- 14. Establish schedule for progress meetings.
- 15. Other administrative items as appropriate.

1.4 PROGRESS MEETINGS

- A. Progress meetings shall be held as needed throughout the course of the Project.
- B. Attendance: The meeting will be attended by the Architect, the Contractor's Superintendent, and the Owner's Representative. When requested by the Owner, the Architect or the contractor, sub-contractors and the Architect's Consultants may also attend.

1.5 SPECIAL MEETINGS

- A. Upon appropriate notice to other parties, special meetings may be called by the Owner or Architect, at times agreed to by all parties involved.

1.6 POST-CONSTRUCTION CONFERENCE

- A. A post-construction conference will be held prior to final inspection of the work to discuss and resolve all unsettled matters. Bonds and insurance are to remain in force and the other documents required to be submitted by the Contractor will be reviewed and all deficiencies determined. Schedules and procedures for the final inspection process and for the correction of defects and deficiencies shall be discussed and agreed upon.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. The work includes the preparation and submission of the schedules and reports specified herein, including the up-to-date maintenance thereof as required. The Conditions of the Contract and the other sections of Division 1 apply to this section as fully as if repeated herein.

1.2 CONSTRUCTION SCHEDULE

- A. Immediately upon being awarded the Contract and before request for a partial payment, the Contractor shall prepare and submit to the Architect a construction progress schedule. The schedule shall be prepared in chart form according to the Critical Path Method (CPM) with the dates for beginning and completion of each trade and activity included. Computer prepared CPM charts are acceptable. The schedule shall conform to the working time and the time of completion established under the terms of the Contract and shall be subject to modification by and approval of the Owner. When, in the opinion of the Owner, it becomes necessary to accelerate the work, the Contractor, when so ordered, shall modify the schedule to conform to such requirements.
- B. The Construction Schedule shall be continuously updated and, if necessary, redrawn and submitted simultaneously with the application for progress payments. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.
- C. A copy of the most recent updated Construction Schedule shall be posted in the Contractor's job office, and copies of all out-of-date schedules shall be kept at the job office at all times for perusal by the Owner.

1.3 SUBMITTAL SCHEDULE

- A. The Contractor shall also furnish a separate schedule along with the Construction Schedule specified above, showing the proposed dates for submittal of all samples, shop drawings, and product data.
- B. Submit two copies of the submittal schedule to the Architect.

1.4 SCHEDULE OF VALUES

- A. Immediately upon being awarded the Contract, and before request for payment, prepare and submit to the Architect a Schedule of Values allocated to the various portions of the work. This Schedule of Values, unless objected to by the Architect, shall be used only as the basis for the Contractor's Applications for Payment.
- B. The schedule shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress payments during construction. Follow the table of contents of this Project Manual as the format for listing component items. For each major line item list sub-values of major products or operations under the item, where applicable.
- C. Each item shall include a directly proportional amount of the Contractors overhead and profit.

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

D. For items on which progress payments will be requested for stored materials, break down the value into (1) the cost of the materials, delivered and unloaded, with taxes paid, and (2) the total installed value.

E. The sum of all values listed in the schedule shall equal the total Contract sum.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submittal Procedures
- B. Shop Drawings
- C. Product Data
- D. Samples
- E. Manufacturers' Instructions
- F. Manufacturers' Certificates
- G. Coordinated Drawings

1.2 SUBMITTAL PROCEDURES

Project submittals shall be submitted by contractor in electronic format – hard copies of final stamped approved submittals shall be provided to the district by contractor.

- A. Transmit separate request for each submittal directly to the General Contractor.
 - 1. Bind submittals sturdily, neatly label covers.
 - 2. Include Architect job number as it appears on Contract Documents.
 - 3. Include state agency application or approval number.
- B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and Specification Section number, as appropriate.
 - 1. Provide name and telephone number of individuals who may be contacted for further information.
- D. Apply Contractor's dated stamp with Contractor's original signature or initials affixed thereto, certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents. Stamped signatures or initials are not acceptable.

- E. Schedule submittals to expedite the Project. Coordinate submission of related items.
 - 1. Make all submittals in accordance with the progress schedule and far enough in advance of scheduled dates of installation to provide required time for reviews for securing necessary approvals for possible revision and resubmittal and for placing orders and securing delivery.
- F. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- G. State effect of substitution on construction schedule, and changes required in other work or products.
- H. Provide space for Contractor and Architect review stamps.
- I. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- J. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- K. Determine and verify all field dimensions and conditions, materials, catalog numbers and similar data.
- L. Coordinate as required with all trades and all public agencies involved.
- M. Unless otherwise specifically authorized by Architect, make all submittals in groups containing all associated items. Architect may reject partial submittals as not complying with the provisions of this section.

1.3 SHOP DRAWINGS

- A. Submit a schedule of the shop drawings, listing their required submission and review dates to the Architect for review and acceptance. The schedule shall allow sufficient time for checking by the Architect. In addition, the shop drawing submission and review dates shall be incorporated into the progress schedule required in the General Conditions.
- B. Submit newly prepared information, drawn to accurate scale. Highlight, encircle or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project will not be approved as Shop Drawings.
- C. Shop Drawings shall include fabrications and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the 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.
- D. Sheet Size: Except for templates, patterns and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 inch x 11 inch, but not larger than 30 inch x 42 inch.
- E. The Contractor shall review, stamp with his approval as herein required, and submit with reasonable promptness and in orderly sequence, in accordance with the submittal schedule, all shop drawings required by the Contract Documents or subsequently by the Architect as covered by modifications. Shop drawings shall be properly identified. At the time of submission, the Contractor shall inform the Architect in writing of any deviation in the shop drawings from the requirements of the Contract Documents.
- F. Stamp: Each page of shop drawings shall bear the Contractor's stamp, which shall signify the Contractor's representation that he has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained in the shop drawings. Each stamp shall be accompanied by a wet signature or initial of an employee of the Contractor who may be contacted for information. Stamped signatures or initials are not acceptable.
- G. Method of Review: Make initial submittal of two blueline prints and one sepia transparency of the shop drawings. Comments or corrections will be noted on the transparency and returned to the Contractor, who shall identify all changes made since the previous submittal and resubmit in the same manner. When reviewed, the transparency will be stamped and returned to the Contractor who shall make distribution of copies as required.
- H. The Architect will review shop drawings with reasonable promptness so as not to cause any delay, but only for conformance with the design concept of the project and with the information given in the Contract Documents. The Architect's favorable review of a separate item shall not indicate acceptance of an assembly in which the item functions.
- I. Submittal of shop drawings to the Architect shall be made by the Contractor with a dated transmittal form or letter, and not by subcontractors or suppliers.
- J. The Architect's review of shop drawings shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Architect in writing of such deviation at the time of submission and the Architect has given written acceptance to the specific deviation, nor shall the Architect's favorable review relieve the Contractor from responsibility for errors or omissions in the shop drawings.
- K. No portion of work requiring shop drawings shall be commenced until the shop drawings have been returned with a favorable review by the Architect.

1.4 PRODUCT DATA

- A. Submit data in electronic format. Hard copies of final stamped approved submittals shall be provided to the district by contractor.
- B. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. After review, distribute and provide copies for Record Documents.

1.5 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures and patterns for Architect selection, or in custom colors selected.
- C. Include identification on each sample with full Project information.
- D. Submit a minimum of six (6) samples or as specified in individual sections of the specifications, three of which will be retained by the Architect.
- E. Reviewed samples which may be used in the Work are indicated in individual specification Sections.
- F. Selection or rejection of samples will be made by the Architect in writing.

1.6 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.7 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification Sections, submit manufacturers' certificate to Architect for review in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to Architect.

1.8 COORDINATED DRAWINGS

- A. Submit drawings which indicate routing, locations, sizes, types and numbers of components in concealed spaces where potential conflict may occur between structures, mechanical, electrical, fire sprinklers, communications and ceiling suspension systems.
- B. Indicate locations of all ceiling penetrations and surface-mounted items. Provide cross sections at all areas to indicate proper support of ceilings and non-interference with work of other sections of the specifications. Cross sections shall indicate coordination required and proposed solutions for routing of elements where potential conflict exists. Reproduction of Architect's reflected ceiling plan is not acceptable.
- C. Drawings shall be based on field measurements, shop drawings and product data.
- D. Conflicts shall be brought to Architect's attention immediately.
- E. Submit to the General Contractor, in writing, requests for clarification or interpretations that will affect the intent of the Contract Documents.

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SUBMITTAL PROCEDURES**

- F. The coordinated drawings shall indicate each class of work in the affected area. The drawing or written submittal shall include Contractor's recommendations for the solution of any potential conflicts as well as recommendations tendered by any work of any section of the specifications which may be affected thereby.
- G. Submit the coordinated drawings in a scale of not less than 1/8" = 1' - 0" with necessary sections and profiles at an appropriate, clearly readable enlarged scale. Submit the coordinated drawings as one reproducible and two blue-line prints.
- H. The Architect will review the submittals, make appropriate notations and comments to ensure the solution meets the intent of the Contract Documents and then return to Contractor for implementation.
- I. The Contractor shall be responsible for the proper coordination of the work of all sections of the specifications in the execution of coordinated drawing. Any installation of materials, components or equipment under one section of the specifications without full and complete, agreement, knowledge and consent by fabricators of adjacent or otherwise related or affected work will not be approved.
- J. It shall be incumbent upon the Contractor that all fabricators of work involved in the execution of coordinated drawings be informed, consulted and advised in sufficient advance time to arrive at solutions where no extension of contract time or extra cost to the Owner will be approved due to Contractor's negligence in the expeditious, timely submittal of coordinated drawings.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

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SECTION 01 35 42 – CALGREEN REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section includes general requirements and procedures for compliance with 2022 CALGreen nonresidential mandatory requirements.
- B. Related Sections:
 - 1. Divisions 01 through 33 Sections, as applicable, for CALGreen requirements specific to the work of each of those Sections.

1.2 SUBMITTALS

- A. CALGreen submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CALGreen requirements.
- B. Contractor shall develop a spreadsheet or use one furnished by the Architect building department to track submittals required by CALGreen.
- C. CALGreen Submittals:
 - 1. Furnish documentation showing verification of CALGreen compliance as required by enforcing agency.
 - 2. Section 5.106.1 - Storm Water Loss Prevention Plan: Newly constructed projects and additions which disturb less than one acre of land shall prevent the pollution of stormwater runoff from the construction activities through one or more of the following measures:
 - a. Local ordinance, 5.106.1.2.
 - b. Best management practices (BMP) complying with Section 5.106.1.2.
 - 3. Section 5.106.10 - Grading and Paving: Furnish drawing showing grading and paving designed to keep surface water from entering buildings.
 - 4. Section 5.408.2 - Construction Waste Management Plan: Furnish a construction waste management plan complying with specified requirements.
 - 5. Section 5.504.4.5 - Composite Wood Products: Furnish documentation showing compliance with Section 5.504.4.5.
 - 6. Section 5.504.5.6 - Resilient Flooring: Furnish documentation showing resilient flooring materials meet the pollutant emission limits.

1.3 SUMMARY OF CALGREEN REQUIREMENTS

- A. Division 5.1 - Planning and Design:
 - 1. Site Development Requirements: Comply with the applicable requirements of Section 5.106.
 - a. Section 5.106.1 - Storm Water Pollution Program: Newly constructed projects and additions which disturb less than one acre of land shall prevent

the pollution of stormwater runoff from the construction activities through one or more of the following measures:

- 1) Local ordinance, 5.106.1.2.
 - 2) Best management practices (BMP) complying with Section 5.106.1.2.
- b. Section 5.106.4 - Bicycle Parking: Comply with Section 5.106.4.1 or 5.106.4.2, as applicable, for short-term and long-term bicycle parking.
- c. Section 5.106.5.2 - Designated Parking: Comply with Section 5.106.5.2 for designated parking for low-emitting, fuel-efficient and carpool/van pool vehicles.
- d. Section 5.106.8 - Light Pollution Reduction: Comply with Section 5.106.8.1 for outdoor lighting systems.
- e. Section 5.106.10 - Grading and Paving: Construction and grading plans shall comply with Section 5.106.10.
- B. Division 5.3 - Water Efficiency and Conservation:
1. Section 5.303 - Indoor Water Use: Comply with the applicable requirements of Section 5.303 and Table 5.303.2.2 for Indoor Water Use Baseline.
 2. Section 5.304 - Outdoor Water Use: Comply with the applicable requirements of Section 5.304.
- C. Division 5.4 - Material Conservation and Resource Efficiency:
1. Section 5.407 - Water Resistance and Moisture Management: Comply with requirements specified in Section 5.407 for Weather Protection and Moisture Control.
 2. Section 5.408 - Construction Waste Reduction, Disposal and Recycling: Comply with requirements specified in Section 5.408.
 - a. Recycled and/or salvage for reuse a minimum of 50-percent of the nonhazardous construction and demolition waste or meet a local construction and demolition waste management ordinance, whichever is more stringent.
 - b. Where the local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan with the following:
 - 1) Identify the materials to be diverted from disposal by efficient usage, recycling, reuse on the Project or salvage for future use or sale.
 - 2) Determine if materials will be sorted on-site or mixed.
 - 3) Identify diversion facilities where material collected will be taken.
 - 4) Indicate the amount of materials diverted, calculated by weight or volume, but not by both.
 - c. Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with Section 5.408.1.2.
 - d. The combined weight of new construction disposal that does not exceed 2-pounds per sq. ft. of building area may be deemed to meet the 50-percent minimum requirement.

- e. Documentation shall be provided to the enforcing agency which demonstrated compliance with Section 5.408.1 thru 5.408.1.3. The waste management plan shall be updated as required and shall be accessible during construction for examination by the enforcing agency.
 - f. 100-percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled.
3. Section 5.410 - Building Maintenance and Operation: Comply with the Requirements specified in Section 5.410.
- a. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including paper, corrugated cardboard, glass, plastics and metals.
 - b. For new buildings of 10,000-sq. ft. or more, comply with the commissioning requirements specified in Section 5.410.2. Commissioning shall be performed by trained personnel with experience on projects of comparable size and complexity. General commissioning requirements include the following. The specific requirements of each item are specified in Section 5.410.2.1 thru 5.410.2.6.
 - 1) Owner's or Owner Representative's project requirements.
 - 2) Basis of design.
 - 3) Commissioning measures shown in the Construction Documents.
 - 4) Commissioning plan.
 - 5) Functional performance testing.
 - 6) Documentation and training.
 - 7) Commissioning report.
 - c. For new buildings less than 10,000-sq. ft., test and adjust systems as specified in Sections 5.410.4.2 thru 5.410.4.5.
- D. Division 5.5 - Environmental Quality:
1. Section 5.504 - Pollutant Control: Comply with the requirements specified in Section 5.504.
- a. The permanent HVAC system shall only be used during construction if necessary, to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a minimum MERV of 8.
 - b. Cover duct openings and protect mechanical equipment during construction as specified in Section 5.504.3.
 - c. Finish materials shall comply with the requirement specified in Sections 5.504.4.1 thru 5.504.4.4, as follows:
 - 1) Adhesives, adhesive bonding primers, adhesive primers and caulks shall meet the following requirements:
 - a) Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable or SCAQMD Rule 1168 VOC limits as shown in Tables 5.504.4.1 and 5.504.2.

- b) Aerosol adhesives and smaller unit sizes of adhesives, and sealant or caulking compounds shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of CCR Title 17, commencing with Section 94507.
- 2) Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3 unless more stringent local limits apply.
 - a) Aerosol paints and coatings shall meet the PWMIR Limits for VOC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of CCR, Title 17, commencing with Section 94520 and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.
- 3) Carpet shall meet the testing and product requirements of one of the following, as required by Section 5.504.4.4:
 - a) Carpet and Rug Institute's Green Label Plus Program.
 - b) California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350).
 - c) NSF/ANSI 140 at the Gold level.
 - d) Scientific Certifications Systems Sustainable Choice.
- 4) Carpet cushion shall meet the requirements of the Carpet and Rug Institute Green Label program.
- 5) Carpet adhesive shall meet the requirements of Table 5.504.4.1.
- 6) Composite wood products, including hardwood plywood, particleboard and medium density fiberboard, used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.) by or before the dates specified in those sections, as shown in Table 5.504.4.5.
- 7) For 80% of floor area receiving resilient flooring, installed resilient flooring shall meet at least one of the following:
 - a) Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.
 - b) Compliant with the VOC emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010.
 - c) Compliant with CDPH criteria as certified under the Greenguard Children's & Schools Programs.
- d. Provide regularly occupied areas of the building with air filtration media for outside and return air prior to occupancy that provides at least a MERV of 8 as specified in Section 5.504.5.3.

- e. Where outdoor areas are provided for smoking, prohibit smoking within 25-feet of building entries, outdoor air intakes and operable windows and in buildings; or as enforced by ordinances, regulations or policies of any city or County, whichever are more stringent. Post signage to inform building occupants of the prohibitions.
 - 2. Indoor Moisture Control: Comply with the requirements specified in Section 5.505.
 - 3. Indoor Air Quality: Comply with the requirements specified in Section 5.506.
 - 4. Environmental Comfort: Comply with the requirements specified in Section 5.507.
 - 5. Outdoor Air Quality: Comply with the requirements specified in Section 5.508.
- E. Summary:
- 1. Certain CALGreen Measures needed to comply with code are dependent on material selections, documentation and means and methods of the work. Each item related to CALGreen may not be specifically identified as CALGreen requirements in this Section. Refer to CALGreen Code, CCR Title 24, Part 11 for complete descriptions of measures and submittal requirements.
 - 2. Designate an onsite field staff person contact for all CALGreen prerequisites and credit documentation, subcontractor supervision and submittal coordination and to manage the Contractor's portions of the CALGreen submittal process.
 - 3. Documentation for CALGreen Measures shall be submitted in the format required by the CALGreen code.
 - 4. A copy of the CALGreen code, CCR Title 24, Part 11 shall be available on-site at all times.
 - 5. Additional information on CALGreen can be found at <http://www.bsc.ca.gov>.
- F. Meetings:
- 1. Contractor shall conduct CALGreen compliance meetings as required. Contractor personnel who shall attend CALGreen compliance meetings include, but are not limited to:
 - a. Contractor's project manager.
 - b. Owner's Representative.
 - c. Other attendees designated by Owner's Representative.
 - d. Subcontractor representatives as appropriate to stage of work.
 - 2. At a minimum, CALGreen compliance issues shall be discussed at the following meetings:
 - a. Preconstruction meetings.
 - b. Progress meetings.
 - c. Subcontractor meetings.
 - d. Meetings shall be scheduled as part of regularly scheduled job meetings on-site.

PART 2 - PRODUCTS

2.1 NOT USED.

PART 3 - EXECUTION

3.1 NOT USED.

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Contractor Quality assurance submittals.
- B. Quality assurance.
- C. Testing and inspection agencies and services.
- D. Contractor's construction-related professional design services.
- E. Control of installation.
- F. Mock-ups.
- G. Tolerances.
- H. Manufacturers' field services.
- I. Defect Assessment.

1.2 RELATED REQUIREMENTS

- A. Section 01 33 00 - Submittal procedures.
- B. Section 01 60 00 - Product Requirements: Requirements for material and product quality.
 - 1. Product options, substitutions, transportation and handling requirements, storage and protection requirements, and system completeness requirements.

1.3 REFERENCE STANDARDS

- A. [IAS AC89](#) - Accreditation Criteria for Testing Laboratories; 2017.

1.4 DEFINITIONS

- A. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.

1.5 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:
 - 1. Temporary sheeting, shoring, or supports.
 - 2. Temporary scaffolding.
 - 3. Temporary bracing.
 - 4. Temporary falsework for support of spanning or arched structures.
 - 5. Temporary stairs or steps required for construction access only.

6. Temporary hoist(s) and rigging.
7. Investigation of soil conditions to support construction equipment.

1.6 SUBMITTALS

- A. See Section 01 33 00 – Submittal Procedures.
- B. Designer's Qualification Statement: Submit for Architect's knowledge as contract administrator, or for District's information.
 1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
 - a. Full name.
 - b. Professional licensure information.
 - c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.
- C. Quality Control Submittals Schedule
 1. Schedule Format: Include quality control submittals on Submittals Schedule specified in accordance with General Conditions
 2. Schedule Content: List all tests, inspections and reports specified to be submitted, indicating submittal number, submittal type (field test, field inspection, fabrication inspection, etcetera), scheduled date of quality control activity and date report should be made.
- D. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for District's information.
 1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
 2. Include required product data and shop drawings.
 3. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
 4. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.
- E. Test Reports: After each test/inspection, promptly submit two copies of report to Architect, DSA, and to Contractor.
 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.

- f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Compliance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.
 - 2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for District's information.
- F. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
- 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- G. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the District's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- H. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for District.
- 1. Submit report in duplicate within 30 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
- I. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for District.
- 1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
 - 2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or District.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications:
- 1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

3. Qualification Statement: Provide documentation showing testing laboratory is approved by Division of the State Architect.
4. Qualification Statement: Provide documentation showing testing laboratory is accredited under [IAS AC89](#).
- B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in California.
- C. Contractor's Quality Control (CQC) Plan:
 1. Prior to start of work, submit a comprehensive plan describing how contract deliverables will be produced. Tailor CQC plan to specific requirements of the project. Include the following information:
 - a. Management Structure: Identify personnel responsible for quality. Include a chart showing lines of authority.
 - 1) Include qualifications (in resume form), duties, responsibilities of each person assigned to CQC function.
 - b. Management Approach: Define, describe, and include in the plan specific methodologies used in executing the work.
 - 1) Management and control of documents and records relating to quality.
 - 2) Communications.
 - 3) Coordination procedures.
 - 4) Resource management.
 - 5) Process control.
 - 6) Inspection and testing procedures and scheduling.
 - 7) Control of noncomplying work.
 - 8) Tracking deficiencies from identification, through acceptable corrective action, and verification.
 - 9) Control of testing and measuring equipment.
 - 10) Project materials certification.
 - 11) Managerial continuity and flexibility.
 - c. District will not make a separate payment for providing and maintaining a Quality Control Plan. Include associated costs in Bid price.
 - d. Acceptance of the plan is required prior to start of construction activities not including mobilization work. District's acceptance of the plan will be conditional and predicated on continuing satisfactory adherence to the plan. District reserves the right to require Contractor to make changes to the plan and operations, including removal of personnel, as necessary, to obtain specified quality of work results.
- D. Quality-Control Personnel Qualifications. Engage a person with requisite training and experience to implement and manage quality assurance (QA) and quality control (QC) for the project.

1.8 REGULATORY REQUIREMENTS FOR TESTING AND INSPECTION

- A. Inspections, testing and approvals as required by authorities having jurisdiction. Refer to Section 01 41 00 - Regulatory Requirements.

- B. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report requirements in preparing, fabricating, erecting, installing, applying, connecting and finishing Work.
- C. Deviations from Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.

1.9 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. District will employ and pay for services of an independent testing agency approved by DSA to perform other specified testing.
- B. As indicated in individual specification sections, District or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- D. Contractor Employed Agency:
 - 1. Laboratory Qualifications: Accredited by IAS according to [IAS AC89](#).
 - 2. Laboratory: Authorized to operate in California.
 - 3. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
 - 4. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 CONTRACTOR'S QUALITY ASSURANCE

- A. Quality Requirements: Work shall be accomplished in accordance with quality requirements of the Drawings and Specifications, including, by reference, all Codes, laws, rules, regulations and standards. When no quality basis is prescribed, the quality shall be in accordance with the best accepted practices of the construction industry for the locale of the Project, for projects of this type.
- B. Quality Control Personnel: Contractor shall employ and assign knowledgeable and skilled personnel as necessary to perform quality control functions to ensure that the Work is provided as required.

3.2 CONTROL OF INSTALLATION

- A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects and fit for the intended use.

- B. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- C. Comply with manufacturers' instructions, including each step in sequence.
- D. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- E. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- F. Have work performed by persons qualified to produce required and specified quality.
- G. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.
- I. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements.
- J. Protection of Existing and Completed Work: Take all measures necessary to preserve and protect existing and completed Work free from damage, deterioration, soiling and staining, until Acceptance by the District.
- K. Verification of Quality: Work shall be subject to verification of quality by District, or Architect in accordance with provisions of the General Conditions of the Contract.
 - 1. Contractor shall cooperate by making Work available for inspection by District, Architect or their designated representatives.
 - 2. Such verification may include mill, plant, shop, or field inspection as required.
 - 3. Provide access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.
 - 4. Provide all information and assistance as required, including that by and from subcontractors, installers, fabricators, materials suppliers and manufacturers, for verification of quality by District, or Architect.
 - 5. Contract modifications, if any, resulting from such verification activities shall be governed by applicable provisions in the General Conditions.

3.3 MOCK-UPS

- A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.

- B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
- C. Integrated Exterior Mock-ups: Construct integrated exterior mock-up as indicated on drawings. Coordinate installation of exterior envelope materials and products as required in individual Specification Sections. Provide adequate supporting structure for mock-up materials as necessary.
- D. Notify Architect fifteen (15) working days in advance of dates and times when mock-ups will be constructed.
- E. Provide supervisory personnel who will oversee mock-up construction. Provide workers that will be employed during the construction at Project.
- F. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
- G. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- H. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
 - 1. Architect will issue written comments within seven (7) working days of initial review and each subsequent follow up review of each mock-up.
 - 2. Make corrections as necessary until Architect's approval is issued.
- I. Accepted mock-ups shall be a comparison standard for the remaining Work.
- J. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.
- K. Where possible salvage and recycle the demolished mock-up materials.

3.4 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.5 TESTING AND INSPECTION

- A. See individual specification sections for testing required.
- B. Testing Agency Duties:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.

4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
6. Perform additional tests and inspections required by Architect.
7. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the Work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 6. Arrange with District's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 7. Inspections and Tests by Authorities Having Jurisdiction:
 - a. Contractor shall cause all tests and inspections to be made for Work under this Contract, as required by Building Departments, Department of Public Works, Fire Department, Health Department and similar agencies having jurisdiction.
 - b. Excepted as specifically noted, scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.
8. Inspections and Tests by Serving Utilities:

- a. Contractor shall cause all tests and inspections required by serving utilities to be made for Work under this Contract.
- b. Scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.
- E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.6 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
 - 1. Observer subject to approval of Architect.
 - 2. Observer subject to approval of District.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.7 FIELD QUALITY CONTROL SUBMITTALS

- A. Administration: Make all submittals to the Architect, unless otherwise directed.
- B. Submittal Identification: Identify each submittal by Specification Section number followed by a number indicating sequential submittal for that Section. Coordinate submittal numbers with submittals specified in Section 01 30 00 - Administrative Requirements.
 - 1. Resubmittals shall use same number as original submittal, followed by a number indicating sequential resubmittal.

03 30 00 - 1	First submittal for Section 03 30 00 - Cast in Place Concrete.
03 30 00 - 2	Second submittal for Section 03 30 00 - Cast in Place Concrete.
03 30 00 - 2.1	Resubmittal of second submittal for Section 03 30 00 - Cast in Place Concrete.
03 30 00 - 2.2	Second resubmittal of second submittal for Section 03 30 00 - Cast in Place Concrete.

- C. Project Identification: Title each submittal with Project name, submittal date and Architect's Project number.
- D. Copies: Provide PDF copies electronically transmitted or submit 6 copies, minimum, of reports of quality control reports on dry-process xerographic copies only.

- E. Contractor's Review:
 - 1. Submittals shall be made in accordance with requirements specified herein and in individual Sections.
 - 2. Indicate clearly on each submittal the specified or referenced values for each quality control activity and the values obtained.
 - 3. Note clearly and sign each submittal certifying that reported quality control activity "Conforms" or "Does Not Conform".
- F. Changes and Deviations:
 - 1. Identify all deviations from requirements of Drawings and Specifications.
 - 2. Changes in the Work shall not be authorized by submittals review actions.
 - 3. No review action, implicit or explicit, shall be interpreted to authorized changes in the Work.
 - 4. Changes shall only be authorized by separate written Change Order or Construction Change Directive, in accordance with the General Conditions and 01 20 00 - Price and Payment Procedures.
- G. Record Submittals: When record submittals are specified, submit three copies or sets only. Record submittals will not be reviewed but will be retained for historical and maintenance purposes.
- H. Unsolicited Submittals: Unsolicited submittals will be returned unreviewed.

3.8 ARCHITECT'S REVIEW

- A. General:
 - 1. Submitted Report review by Architect and Architect's consultants shall be only for general conformance with the design concept and requirements based on the information presented.
 - 2. Neither Architect nor Architect's consultants shall verify submitted quality control data.
- B. Contract Requirements:
 - 1. Review by Architect and Architect's consultants shall not relieve the Contractor from compliance with requirements of the Drawings and Specifications.
 - 2. Changes shall only be authorized by separate written Change Order or Construction Change Directive, in accordance with the General Conditions and 01 20 00 - Price and Payment Procedures.
- C. Observations by Architect and Architect's Consultants: Periodic and occasional observations of Work in progress will be made by Architect and Architect's consultants as deemed necessary to review progress of Work and general conformance with design intent.

3.9 DEFECT ASSESSMENT

SECTION 01 40 00
QUALITY REQUIREMENTS

- A. Replace Work or portions of the Work not conforming to specified requirements, at no change in Contract Sum or Contract Time.
- B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.
- C. Architect's Acceptance and Rejection of Work: Architect reserves the right to reject all Work not in conformance to the requirements of the Drawings and Specifications.
- D. Acceptance of Non-Conforming Work: Acceptance of non-conforming Work, without specific written acknowledgement and approval of the District, shall not relieve the Contractor of the obligation to correct such Work.
 - 1. Acceptance of structurally related non-conforming work shall be submitted to DSA for review and approval.
- E. Contract Adjustment for Non-conforming Work:
 - 1. Should Architect or District determine that it is not feasible or in District's interest to require non-conforming Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between District and Contractor.
 - 2. If equitable amount cannot be agreed upon, a Construction Change Directive will be issued and the amount in dispute resolved in accordance with applicable provisions of the General Conditions.
- F. Non-Responsibility for Non-Conforming Work: Architect and Architect's consultants disclaim any and all responsibility for Work produced not in conformance with the Drawings and Specifications.

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SECTION 01 40 54 - CONTRACTOR SAFETY

PART 1 – GENERAL

A. HEALTH AND SAFETY POLICY

1. The policy of the Owner is to promote safety at a level to minimize personal injury and potential property damage.
2. Employees of contractors working on this project are required to meet or exceed all established and recognized codes and standards for safety and protection of personnel and property.
3. The safety guidelines included here are made available to the Prime Contractor as an extension of the safety clause in your Contract General Conditions Article 10.
4. These guidelines are not intended to be complete in every detail but are merely of a general nature. The separate contractors are in no way relieved of their responsibilities for safety of persons and property, and compliance with all statutes, rules, regulations and orders applicable to the conduct of the work.
5. The possession use or sale of any alcoholic beverage or illegal controlled drug substance will not be permitted on or immediately adjacent to the job site by any prime contractor, contractor employee, subcontractor employer or associate.
6. The abuse of prescribed medication will not be permitted on or immediately adjacent to the job site by any prime contractor, contractor employee, subcontractor employee or associate.
7. This Contractor, and other contractors, share the responsibility of monitoring and enforcing, as necessary, A.5 and A.6 above. Any known, (or with due cause believed to be), violator of A.5 or A.6 shall be immediately reported to the General Contractor.
8. The Owner reserves the right to take corrective action, as deemed in the best interest of the project and the Owner, for violation of any health or safety standard.

This corrective action may include but is not limited to; removal (from the job site) any unsafe tools/equipment, temporary work stoppage for any unhealthy or unsafe condition, immediate removal (from the job site) any person that is unwilling or incapable of conducting themselves in a manner that promotes a healthy and safe working atmosphere. Any person found to be repeatedly in violation of health and/or safety standards will be permanently removed from the site.

B. RESPONSIBILITIES

1. The Owner demands that all project contractors perform in a reasonable and safe manner.
2. The contractors working on this project have the ultimate and total responsibility to conduct a sound accident control program as it pertains to their work and their employees, as well as to ensure safe working conditions for employees of other contractors.
3. The Contractor will ensure his employees cooperate with and coordinate safety matters with other contractors to form a joint safety effort.

4. Employees who have been or will be exposed to excessive (measured against applicable standards) levels of toxic materials or harmful physical agents shall be notified by the Contractor. Notice of corrective action being taken shall be provided to the employees. Accurate records must be kept of all exposures which are required to be monitored under the State and Federal Codes.
5. In the event of a defense by the Contractor against unsafe independent employee actions, the Appeals Board requires that you must show evidence of the following:
 - a. That the employee was experienced in the job being performed;
 - b. That you as the employer have a well devised safety program which includes training employees in safety matters relating to their individual job assignments;
 - c. That you effectively enforce your safety program;
 - d. That you have and enforce a policy of sanctions against employees who violate your safety program; and
 - e. That the employee caused a safety infraction which he or she knew was in violation of your safety requirement.

C. SAFETY ACTIVITIES

1. Contractors will conduct or initiate:
 - a. Safety program as required by current State of California requirements.
 - b. Weekly "tool box" safety meetings between Contractor and Contractor's supervisors, foremen, employees and subcontractors working on the project; and
 - c. Weekly safety inspections of your work area and those areas of work under your responsibility or shared responsibility as well as taking any other necessary safety precautions.

D. REPORTS

1. Submit all preliminary, periodic and special reports to the Architect. The Sub-Contractor is in no way relieved of the requirements for submission of reports to any agency or authority.
 - a. All reports listing deficiencies, accidents or injuries shall show corrective action taken.
 - b. A weekly status and summary report of each "tool box" meeting held and items discussed.
 - c. A weekly status report of inspection results. The attached status forms are for your convenience only.
 - d. A continuing list of deficiencies found including the date identified, responsible party, corrective action and date corrected.
 - e. Accident reports and injury forms. Submit a copy of one of the following to the Owner for each case:
 - i. California Division of Labor Statistics and Research Form 5020 (latest rev.), or;
 - ii. Federal OSHA Form 101, or;
 - iii. Insurance Company form similar to 1 or 2 above.
 - f. A copy of CAL/OSHA Form 200 "Log and Summary of Occupational Injuries and Illness."

2. Special Reports
 - a. Notify the Owner immediately of any accident involving injury to personnel or property and complete written reports within 24 hours of a death or injury of five (5) or more employees as a result of one accident.
 - b. Copies of all toxic or harmful agent reports (See paragraph B.4.)
3. Governmental Reports
 - a. Notification of governmental authorities is the responsibility of each affected contractor.

E. SAFETY DEFICIENCY CORRECTION

1. All safety deficiencies will be corrected by Contractors in accordance with the following priorities.
 - a. Immediate correction of items with any probability of major or minor injury to people.
 - b. Correction immediately of any accident probability which could involve people and/or equipment.
 - c. Correction within one day (or sooner) of potential injury or damage to property.

F. OUTSIDE SAFETY INSPECTIONS

1. Unannounced inspections by city, state or federal safety agencies or insurance companies may occur.
 - a. Sub-Contractors are to escort representatives of these agencies or companies directly to the Prime Contractor and assist him as required or directed.
 - b. If the Contractor is not available, the Prime Contractor's foreman or representative shall accompany the inspector on the inspection.

G. INVESTIGATING

1. All injuries are to be investigated by the contractors and reported.
2. The Prime Contractor shall be notified prior to proceeding with an investigation.

H. SAFETY STANDARDS AND CODE

1. All contractors are to provide their job supervision with applicable safety code publications and ensure they are familiar with the contents.
2. Occupation Safety and Health Administration Standards (latest applicable edition) on the designated applicable safety standards.
3. In states with OSHA approved plans, state codes will take precedence unless federal standards are more stringent, in which case federal standards shall apply.
4. On General Services Administration (GSA) projects, applicable sections of the GSA Manual Accident & Fire Prevention on Construction and Alteration Work will apply in addition to all other codes and standards.

5. All code and standard conflicts will be resolved by applying the most restrictive code and/or standard.
6. Suggested references for contractors are:
 - a. Safety & Health Regulation for construction, U.S. Department of labor, OSHA, Volume 37, No. 243
 - b. Construction safety orders, State Standard, CAL/OSHA, state of California, latest edition
 - c. GSA Manual - GSA -PBSP 5900.3
 - d. U.S. Army Engineering Manual - BM 385-1
 - e. Accident Prevention, Associated General Contractors
 - f. A Short Guide to the California Occupational Safety and Health Act. -National Federation of Independent Business, 150 West 20th Avenue, San Mateo, California 94403

I. REQUIRED NOTICES: TO BE VISIBLY DISPLAYED

1. Workers' Compensation Insurance Notice
2. OSHA poster: Safety and Health Protection on the job
3. State of California Department of Human Resources: Notice to Employees Unemployment Insurance - Disability Insurance
4. Hard Hat Area Signs
5. List of ambulances, doctors and hospitals with telephone numbers which can be called during an emergency.
6. Name and title of the safety representative from each contractor's organization.
7. Any other safety signs, slogans, etc. that will improve the general awareness of a joint safety program.

J. PERMITS

1. Permits from the Division of Industrial Safety are required before contractors may undertake the following kinds of work:
 - a. Construction of trenches or excavations which are 5 feet or more deep, into which a person is required to descend.
 - b. Construction of any building, structure, falsework or scaffolding more than three stories high.
 - c. Demolition of any building, structure, falsework or scaffolding more than three stories high.
2. The Division of Industrial Safety may investigate or confer with the employer before the start of work. If a pre-job safety conference between the Division of Industrial Safety personnel and the employer is a requirement specified by the Division of Industrial Safety at the time the permit is issued, employees or their representatives are to be included at the conference.

**SECTION 01 40 54
CONTRACTOR SAFETY**

3. Permits must be posted at or near each place of employment requiring a permit. If posting at the actual job site is not possible, the permit must be available for inspection at all times at the site, or, in the case of a mobile unit, at the employer's head office in the area.
4. Additional permits may be required from the Division of Industrial Safety or other applicable governmental agencies. It is the responsibility of each contractor to determine, procure, and pay for their own such permits.

SAFETY STATUS FORMS

THIS REPORT IS TO SERVE AS A MINIMUM STANDARD GUIDELINE AND DOES NOT INCLUDE JOB OR TRADE SPECIFIC ITEMS OR CONDITIONS. SAID ITEMS OR CONDITIONS SHOULD BE ADDED BY CONTRACTOR ON THE LAST PAGE ENTITLED "COMMENTS AND REMARKS".

#:	QUESTION / CHECK LIST COMMENT:	YES	NO	N/A
A. FIRE PROTECTION AND PREVENTION:				
1.	Are all flammable liquid containers clearly identified?			
2.	Are all flammable liquid containers UL or FM listed?			
3.	Have proper storage practices for flammables been observed?			
4.	Have the proper type & adequate number of fire extinguishers been observed at the job site?			
5.	Are extinguishers readily accessible and serviced regularly?			
6.	Are hydrants clear and accessible for Fire Department personnel?			
B. ELECTRICAL				
1.	Are all switch gear, panels, and devices that are energized marked and / or guarded to prevent accidental contact?			
2.	Are lockout devices available and used on all circuits and equipment that could become energized while work is being performed?			
3.	Are all temporary circuits properly guarded and grounded?			
4.	Are all extension cords in continuous lengths without splices or tape?			
5.	Are GFCI's being used? If not, is Assured Equipment Grounding Conductor Program being followed?			
6.	If temporary lighting is provided, are bulbs protected against accidental breakage?			
7.	Are there a sufficient number of temporary outlets on the job site?			
8.	Are there any visual signs of outlet overloading?			
C. HAZARD COMMUNICATION				

#:	QUESTION / CHECK LIST COMMENT:	YES	NO	N/A
1.	Does the Hazard Communication Program include a list of hazardous chemicals?			
2.	Does the Hazard Communication Program include container labeling?			
3.	Does the Hazard Communication Program include "Material Safety Data Sheets" (MSDS)?			
4.	Does the Hazard Communication Program include employee training?			
5.	Does the Hazard Communication Program include personal protective equipment (PPE)?			
6.	Does the Hazard Communication Program include emergency response procedures, information, & phone numbers?			
7.	Does the Hazard Communication Program include a list of hazards for non-routine tasks?			
8.	Does the Hazard Communication Program include procedures for informing other contractors of hazardous conditions and / or procedures?			
9.	Does the Hazard Communication Program include adequate posting of signage & warning labels?			
10.	Is a copy of the Hazardous Communication Program at this job site?			
D. EXCAVATION / TRENCHING				
1.	Have utility companies been notified of proposed excavation work (one-call system)?			
2.	Are overhead utility lines noted and precautions taken to avoid contact by cranes, backhoes, or other heavy equipment?			
3.	Is the excavation inspected daily or more frequently when there is a change in weather or environment that could affect the soil?			
4.	If needed, are barricades, stop logs, etc. properly located?			
5.	Are excavations five (5) feet or deeper correctly sloped, benched, shored, or is a trench box (shield) used?			
6.	Is a ladder or other means of exit (egress) provided in trenches or excavations four (4) feet or deeper?			
7.	When ladders are used, do they extend three (3) feet above the surface and are they secured?			
8.	Are shoring and shielding systems inspected daily by a competent person?			
E. SCAFFOLDING				
1.	Are scaffold components visibly free of any physical damage (no bent supports or cross bracing)?			
2.	Is scaffolding properly erected with all pins and braces in place and locked?			

#:	QUESTION / CHECK LIST COMMENT:	YES	NO	N/A
3.	Are rolling scaffolds equipped with locking wheels?			
4.	Are wheels locked when scaffold is in use?			
5.	Is scaffold erected on a firm and substantial surface?			
6.	Is planking of a scaffold grade?			
7.	Is planking in good condition and properly installed?			
8.	Are toeboards and guardrails in place on scaffolds over 10 feet?			
9.	Are workers on scaffolding protected from falling objects if overhead hazards exist?			
10.	Is a ladder provided for access to scaffold work platform?			
F.	BARRICADING			
1.	Are floor openings planked and secured or barricaded?			
2.	Is a flag person provided to direct traffic when needed?			
3.	Are open excavation, road drop offs, manholes, & uneven surfaces barricaded?			
G.	LADDERS			
1.	Is the proper ladder for the job being used?			
2.	Are ladders in good condition (no missing or broken rungs, etc.)?			
3.	Is there a need for and / or are there safety shoes / cleats on the bottom of ladders?			
4.	Are non-conductive ladders available for use around live wiring?			
5.	Are ladders tied-off at top or otherwise secured?			
6.	Do side rails extend 36 inches above the top of the landing?			
7.	Are step ladders fully opened when in use?			
H.	PERSONAL PROTECTIVE EQUIPMENT			
1.	Is hearing protection available for personnel that may be exposed to noisy conditions?			
2.	Is respiratory protection available to personnel and is it being used when conditions require same			
3.	Are safety harnesses, belts, lifelines, and lanyards available and being used?			
4.	Are personnel using gloves when handling sharp or rough material?			
I.	MEDICAL			
1.	Are first-aid kits available and properly stocked?			

#:	QUESTION / CHECK LIST COMMENT:	YES	NO	N/A
2.	Are all emergency phone numbers posted?			
3.	Are all employees aware of the address of the site or capable of giving proper directions to emergency personnel?			
4.	Is anyone trained in first-aid and CPR?			
J. TOOLS: (hand & power)				
1.	Are tools free of any obvious physical damage?			
2.	Are tools inspected for frayed and damaged cords?			
3.	Are tools and cords properly grounded and are ground pins in good condition?			
4.	Are the handles on all tools in good condition (not bent, splintered, or broken)?			
5.	Are all hoses on air or hydraulic tools in good condition?			
6.	Are all shields and guards in place on the tools and in good condition?			
7.	Has each tool and / or equipment operator received proper operating and safety instruction for each tool and / or piece of equipment which he or she is using?			
8.	Has each user of a powder actuated tool been properly certified and are their certifications current?			
K. WELDING AND CUTTING				
1.	Welding goggles / helmet, gloves, and clothing being used by each welder			
2.	Inspection for fire hazards after welding stops			
3.	Are gas cylinders, hoses, regulators, torches, torch tips, and welding carts in good working order and are same being properly secured?			
L. HOIST, CRANES, AND DERRICKS				
1.	Are cables and sheaves checked?			
2.	Are slings hooks, eyelets, and chokes inspected?			
3.	Are load capacities posted in cab?			
4.	Are power lines at a safe distance?			
5.	Are crane inspection logs with crane?			
M. FLOOR, WALL OPENINGS, STAIRWAYS				
1.	Are floor and roof openings guarded by properly constructed guardrails or a properly reinforced and secured cover?			
2.	Are open-sided floors and platforms six feet or more above the ground guarded with a properly constructed railing?			

#:	QUESTION / CHECK LIST COMMENT:	YES	NO	N/A
3.	Are stairs with four or more risers equipped with standard hand rail construction?			
4.	Are runways four feet or more above the ground properly guarded?			

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SECTION 01 41 00 - REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 AUTHORITY AND PRECEDENCE OF CODES, ORDINANCES AND STANDARDS

- A. Authority: All codes, ordinances and standards referenced in the Drawings and Specifications shall have the full force and effect as though printed in their entirety in the Specifications.
- B. Precedence:
 - 1. Where specified requirements differ from the requirements of applicable codes, ordinances and standards, the more stringent requirements take precedence.
 - 2. Where the Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, the Drawings and Specifications take precedence so long as such increase is legal.
 - 3. Where no requirements are identified in the Drawings or Specifications, comply with all requirements of applicable codes, ordinances and standards of authorities having jurisdiction.
- C. Applicable Codes, Laws and Ordinances: Refer also to Section 01 10 00 - Summary, regarding permits and licenses.
 - 1. Performance of the Work is be governed by all applicable laws, ordinances, rules and regulations of Federal, State and local governmental agencies and jurisdictions having authority over the Project, including accessibility requirements.
 - 2. Performance of the Work shall be accomplished in conformance with all rules and regulations of public utilities, utility districts and other agencies serving the development.
 - 3. Where such laws, ordinances, rules and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to the Contract Time and Contract Sum, except where changes in laws, ordinances, rules and regulations occur subsequent to the execution date of the Agreement.
- D. Applicable Building Codes: References on the Drawings or in the Specifications to "code" or "building code" not otherwise identified shall mean the codes specified below, together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction having authority over the Project.
- E. Performance of the Work shall meet or exceed the minimum regulatory requirements applicable to this project are summarized in this section, as adopted by Division of the State Architect:
 - 1. Part 1, Title 24 CCR - 2025 California Building Standards Administrative Code.
 - 2. Part 2, Title 24 CCR - 2022 California Building Code (CBC).

3. Part 3, Title 24 CCR - 2022 California Electrical Code (CEC, NFPA 70-NEC 2014).
 4. Part 4, Title 24 CCR - 2022 California Mechanical Code (CMC).
 5. Part 5, Title 24 CCR - 2022 California Plumbing Code (CPC).
 6. Part 6, Title 24 CCR - 2022 California Energy Code.
 7. Part 7 - (No longer published in Title 24. See Title 8, CCR).
 8. Part 9, Title 24 CCR - 2022 California Fire Code (CFC).
 9. Part 10, Title 24 CCR - 2022 California Existing Buildings Code.
 10. Part 11, Title 24 CCR - 2022 California Green Building Standards Code (CALGreen).
 11. Part 12, Title 24 CCR - 2022 California Referenced Standards Code.
 12. Elevator Code: See Title 8, CCR.
- F. Erosion and Sedimentation Control Regulations:
1. California Codes and Regulations; Title 24, California Building Code, Parts 1 & 2.
 2. State of California State Water Resources Control Board Regulations.
 3. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; current edition.

1.2 SUMMARY OF REFERENCE STANDARDS

- A. Regulatory requirements applicable to this project are the following:
- B. UL 300 - Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment; 2005 (R2010).
- C. [28 CFR 35](#) - Nondiscrimination on the Basis of Disability in State and Local Government Services; Final Rule; Department of Justice; current edition.
- D. [28 CFR 36](#) - Nondiscrimination by Public Accommodations and in Commercial Facilities; Final Rule; Department of Justice; current edition.
- E. [36 CFR 1191](#) - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- F. [ADA Standards](#) - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- G. [29 CFR 1910](#) - Occupational Safety and Health Standards; current edition.

1.3 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 45 16 – FIELD QUALITY CONTROL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements and limitations for cutting and patching of work.

1.2 SCOPE

- A. Where the work requires that a particular existing building element such as a partition, wall, paving, window, or similar element of existing building construction be removed, it is the intention of this specification that such work be a part of the demolition section and not a part of cutting and patching. Refer to individual category scope of work sheets to determine the limits of demolition work for each contractor.
- B. New work required to replace such removals is considered as a part of the separate sections of the specifications covering similar new construction.
- C. Where incidental cutting and patching is required for the installation of a specific item or piece of equipment (including piping, ductwork, conduit, etc.), all such cutting and patching is considered to be specified as a part of the section requiring the cutting and patching.
- D. Contractor shall verify and check all areas to be cut and patched and shall coordinate the work of the various trades involved.
- E. Where doubt exists as to the size, location, or method of cutting concrete or any other structural element, Contractor shall contact the Architect before proceeding.
- F. Where doubt exists, Contractor shall distinguish between "cutting and "demolition".
- G. Unless specifically designated otherwise, existing work cut, altered, or revised to accommodate new work shall be patched to duplicate undisturbed adjacent finishes, colors, textures, and profiles; new work in existing portions shall also be finished to match adjacent existing work unless noted otherwise.

1.3 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather-exposed or moisture-resistant element.
 - 3. Efficiency, maintenance or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
- B. Include in request:
 - 1. Identification of Project.
 - 2. Location and description of affected work.
 - 3. Necessity for cutting or alteration.
 - 4. Description of proposed work and products to be used.

5. Alternatives to cutting and patching.
6. Effect on work of Owner or separate Contractor.
7. Written permission of affected separate Contractor.
8. Date and time work will be executed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Primary Products: Those required for original installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. Confirm status and current warranties and guarantees.
- B. After uncovering existing work, inspect conditions affecting performance of work.
 1. Prior to cutting, boring or drilling through new or existing structural members or elements including reinforcing bars, Contractor shall prepare detailed drawings for review by the Architect. Agency approvals shall be obtained by the Structural Engineer and Architect, not Contractor.
- C. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Provide temporary support to ensure structural integrity of the work. Provide devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work.
- C. Maintain excavations free of water.

3.3 CUTTING AND PATCHING

- A. Execute cutting, fitting, and patching to complete work.
- B. Fit products together, to integrate with other work.
- C. Uncover work to install ill-timed work
- D. Remove and replace defective or non-conforming work.
- E. Provide openings in the work for penetration of mechanical and electrical work.

3.4 PERFORMANCE

- A. Execute work by methods to avoid damage to other work and which will provide appropriate surfaces to receive patching and finishing.
- B. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- C. Restore work with new products in accordance with requirements of Contract Documents.

- D. Fit work air tight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- E. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

3.5 SLEEVES AND HANGERS

- A. Provide conduit, outlets, piping sleeves, boxes, inserts or other materials or equipment necessary to be built into work. Promptly furnish same and set such sleeves or other materials as construction program required.
- B. In the event delays occur in delivery of sleeves or other materials, arrange to have boxes or other forms set at locations where piping or other material is to pass through or into slabs or other work.
- C. Upon subsequent installation of sleeves or other material, install fill materials as required. Necessary expenditures incurred for boxing out or filling shall be without extra cost to the Owner.

END OF SECTION

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SECTION 01 45 33 - CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Division of the State Architect (DSA) Procedures for construction oversight and inspections required during the course of construction.
- B. Code-required special inspections.
 - 1. Division of the State Architect (DSA) approved testing laboratory services and inspections required during the course of construction.
 - 2. Approved DSA 103 Inspection and Testing should be executed.
- C. Testing services incidental to special inspections.
- D. Submittals.
- E. Manufacturers' field services.
- F. Fabricators' field services.

1.2 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- C. Section 01 40 00 - Quality Requirements.
- D. section 01 60 00 - Product Requirements: Requirements for material and product quality.

1.3 DEFINITIONS

- A. Code or Building Code: California Building Code and, more specifically, Chapter 17A - Structural Tests and Special Inspections, of same.
- B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located. AHJ for this Project is Division of the State Architect.
- C. Special Inspection:
 - 1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the CBC that also require special expertise to ensure compliance with the approved contract documents and the referenced standards.
 - 2. Special inspections are separate from and independent of tests and inspections conducted by District or Contractor for the purposes of quality assurance and contract administration.

1.4 REFERENCE STANDARDS

- A. [ACI 318](#) - Building Code Requirements for Structural Concrete and Commentary; 2022.

SECTION 01 45 33
CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

- B. [ASCE 7](#) - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
1. Use 2010 with Supplements No. 1 and 2, excluding Chapter 14 and Appendix 11A, as indicated in 2022 CBC Referenced Standards.
- C. [ASTM A615/A615M](#) - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2018.
1. Use as indicated in 2022 CBC Referenced Standards.
- D. [ASTM A706/A706M](#) - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2019.
- E. [ASTM A706/A706M](#) - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2019.
1. Use as indicated in 2022 CBC Referenced Standards.
- F. [ASTM C143/C143M](#) - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2015a.
- G. [ASTM C31/C31M](#) - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2018b.
1. Use as indicated in 2022 CBC Referenced Standards.
- H. [ASTM C172/C172M](#) - Standard Practice for Sampling Freshly Mixed Concrete; 2017.
1. Use as indicated in 2022 CBC Referenced Standards.
- I. [ASTM C94/C94M](#) - Standard Specification for Ready-Mixed Concrete; 2018.
1. Use as indicated in 2022 CBC Referenced Standards.
- J. [ASTM D1556/D1556M](#) - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2015, with Editorial Revision (2019).
- K. [ASTM D1557](#) - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2012, with Editorial Revision (2015).
1. Use as indicated in 2022 CBC Referenced Standards.
- L. [ASTM D3740](#) - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.
- M. [ASTM E329](#) - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2018.
- N. [ASTM E543](#) - Standard Specification for Agencies Performing Nondestructive Testing; 2015.
- O. [ASTM E2174](#) - Standard Practice for On-Site Inspection of Installed Firestops; 2018.
1. Use as indicated in 2022 CBC Referenced Standards.

- P. [ASTM E2393](#) - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2010a (Reapproved 2015).
- Q. [ASTM E2570/E2570M](#) - Standard Test Methods for Evaluating Water-Resistive Barrier (WRB) Coatings Used under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage; 2007, with Editorial Revision (2014).
 - 1. Use as indicated in 2022 CBC Referenced Standards
- R. [AWS D1.4/D1.4M](#) - Structural Welding Code - Reinforcing Steel; 2011.
 - 1. Use as indicated in 2022 CBC Referenced Standards
- S. [ICC-ES AC308](#) - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2019.
- T. [NFPA 80](#) - Standard for Fire Doors and Other Opening Protectives; 2016.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
 - 1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 - 3. Submit certification that Special Inspection Agency is acceptable to AHJ.
- C. Testing Agency Qualifications: Prior to the start of work, the Testing Agency is required to:
 - 1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Testing and inspections will be performed by an independent testing laboratory selected and employed by the District and approved by the Division of the State Architect (DSA).
 - a. Qualification of a testing agency or laboratory will be under the jurisdiction of the DSA Structural Safety Section (SSS). Procedural and acceptance criteria are set forth in the California Administrative Code (CBC) Chapter 4.
- D. Manufacturer's Qualification Statement: Manufacturer is required to submit documentation of manufacturing capability and quality control procedures. Include documentation of AHJ approval.
- E. Fabricator's Qualification Statement: Fabricator is required to submit documentation of fabrication facilities and methods as well as quality control procedures. Include documentation of AHJ approval.

- F. Distribution List: The Testing Laboratory will make the following distribution of test and inspection reports:
- | | | |
|----|---------------------------------|---|
| 1. | District | 1 |
| 2. | Architect | 2 |
| 3. | Structural Engineer | 1 |
| 4. | Contractor | 1 |
| 5. | District's Inspector | 1 |
| 6. | Division of the State Architect | 1 |
| 7. | Construction Manager | 1 |
- G. Each and every test or inspection report shall bear the File Number and Application Number assigned to this project by the DSA.
- H. DSA Form 291 shall be from the engineering manager of the laboratory of record.
- I. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one each to the distribution list.
1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of Special Inspector.
 - d. Date and time of special inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of special inspection.
 - h. Date of special inspection.
 - i. Results of special inspection.
 - j. Compliance with Contract Documents.
 2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.
- J. Fabricator Special Inspection Reports: After each special inspection of fabricated items at the Fabricator's facility, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one each to the distribution list.
1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of Special Inspector.
 - d. Date and time of special inspection.
 - e. Identification of fabricated item and specification section.
 - f. Location in the Project.

- g. Results of special inspection.
 - h. Verification of fabrication and quality control procedures.
 - i. Compliance with Contract Documents.
 - j. Compliance with referenced standard(s).
- K. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to Architect and one each to the distribution list.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test or inspection.
 - h. Date of test or inspection.
 - i. Results of test or inspection.
 - j. Compliance with Contract Documents.
 - k. Test reports shall be signed by a Civil Engineer licensed in the State of California.
 - 2. Test reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory.
 - a. Samples taken but not tested shall also be reported.
 - b. Records of special sampling operations as required shall also be reported.
 - c. Reports shall show that the material or materials were sampled and tested in accordance with the requirements of the CBC, and with the approved specifications.
 - d. They shall also state definitely whether or not the material or materials tested comply with requirements.
 - e. Test reports shall be issued within 14 days of finding being known, to all parties listed above.
 - 3. At the completion of the project, Testing Laboratory shall certify in writing and on all required DSA forms, that all work specified or required to be tested and inspected conforms to drawings, specifications and applicable building codes.
 - 4. Verification of Test Reports:
 - a. The Testing Laboratory of record shall submit to the Division of the State Architect (DSA) a verified report covering all tests which are required to be made by that agency during the progress of the project.
 - 1) Such report shall be furnished each time that work on the project is suspended, covering the tests up to that time, and at the completion of the project.
 - b. DSA Form 292 - Special Inspection Verified Report shall be from all special inspectors contracting directly and individually with the school board.

- L. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to Architect and AHJ, in quantities specified for Product Data.
 - 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect and AHJ.
- M. Manufacturer's Field Reports: Submit reports to Architect and AHJ.
 - 1. Submit report in duplicate within 7 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.
- N. Fabricator's Field Reports: Submit reports to Architect and AHJ.
 - 1. Submit report in duplicate within 30 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.

1.6 SPECIAL INSPECTION AGENCY

- A. District will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with 1 and required by the building code.
- B. The Special Inspection Agency may employ and pay for services of an independent testing agency to perform testing and sampling associated with special inspections and required by the building code.
- C. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.7 TESTING AND INSPECTION AGENCIES

- A. District is to employ services of an independent inspection and testing agency to perform observation, testing and sampling associated with special inspections including those not required by the building code. CAC
 - 1. Project Inspector and testing lab are employed by the District and approved by:
 - a. A/E of Record.
 - b. Structural Engineer (when applicable).
 - c. DSA.
- B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.8 QUALITY ASSURANCE

- A. Special Inspection Agency Qualifications:

1. Independent firm specializing in performing testing and inspections of the type specified in this section.
- B. Testing Agency Qualifications:
 1. Independent firm specializing in performing testing and inspections of the type specified in this section.
- C. Testing and inspection services which are performed shall be in accordance with requirements of the CBC, and as specified herein. Testing and inspection services shall verify that work meets the requirements of the Construction Documents.
- D. In general, tests and inspections for structural materials shall include all items enumerated on the Structural Tests and Inspections list for this project as prepared and distributed by the Architect.
- E. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document.

1.9 INSPECTION BY THE DISTRICT

- A. The District shall have the right to reject materials and workmanship which are defective, or to require their correction.
 1. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without charge to the District.
 2. If the Contractor does not correct such rejected work within a reasonable time, the District may correct such rejected work and charge the expense to the Contractor.
- B. Should it be considered necessary or advisable by the District at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out the completed work; the Contractor shall on request promptly furnish necessary facilities, labor and materials.
 1. If such work is found to be defective in any respect due to fault of the Contractor or his subcontractor, he shall defray all expenses of such examinations and of satisfactory reconstruction. .
 2. If, however, such work is found to meet the requirements of the Contract, the additional cost of labor and material necessarily involved in the examination and replacement shall be allowed the Contractor.

1.10 DISTRICT'S INSPECTOR

- A. An Inspector employed by the District and approved by Architect, Structural Engineer and DSA in accordance with the requirements of the California Building Code will be assigned to the work.
 1. IOR duties are specifically defined in CCR Title 24 Part 1, Sec. 4-211(b), 4-214, 4-219, and Group 1 Sec. 4-342.

- B. The District's Inspector shall at all times have access for the purpose of inspection to all parts of the work and to the shops where the work is in preparation, and the Contractor shall at all times maintain proper facilities and provide safe access for such inspection.
- C. The work of construction in all stages of progress shall be subject to the personal continuous observation of the District's Inspector.
 - 1. The Contractor shall furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials.
 - 2. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.
 - 3. Inspector of Record is required to work a normal 40 hour week on this project only. Any overtime required will be at the expense of the Contractor and sub-contractor requiring the inspection.

1.11 PAYMENTS

- A. Costs of initial testing and inspection, except as specifically modified herein, or specified otherwise in technical sections, will be paid for by the District, providing such testing and inspection indicates compliance with Contract Documents. Initial tests and inspections are defined as the first tests and inspections as herein specified.
- B. In the event a test or inspection indicates failure of a material or procedure to meet requirements of Contract Documents, costs for retesting and reinspection will be paid by the District and backcharged to the Contractor.
- C. Additional tests and inspections not herein specified but requested by District or Architect, will be paid for by District, unless results of such tests and inspections are found to be not in compliance with Contract Documents, in which case the District will pay all costs for initial testing as well as retesting and reinspection and backcharge the Contractor.
- D. Costs for additional tests or inspections required because of change in materials being provided or change of source or supply will be paid by District and backcharged to the Contractor.
- E. Costs for tests or inspections which are required to correct deficiencies will be paid by the District and backcharged to the Contractor.
- F. Cost of testing which is required solely for the convenience of Contractor in his scheduling and performance of work will be paid by the District and backcharged to the Contractor.
- G. Overtime costs for testing and inspections performed outside the regular work day hours, including weekends and holidays, will be paid for by the District and backcharged to the Contractor. Such costs include overtime costs for the District's Inspector.
- H. Testing Laboratory shall separate and identify on the invoices, the costs covering all testing and inspections which are to be backcharged to the Contractor as specified above.
- I. Testing Laboratory shall furnish to District a cost estimate breakdown covering initial tests and inspections required by Contract Documents. Estimate shall include number of tests, man-hours required for tests, field and plant inspections, travel time, and costs.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

- A. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
 - 1. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.
 - 2. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.
- B. Tests and inspections for the following will be required in accordance with DSA IR 17-6 and the current CBC, unless otherwise specified.

3.2 SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION (CHAPTER 17A AND 19A)

- A. Inspection:
 - 1. Job Site Inspection: CBC 1705A.3, 1705A.3.5 (Conc. Preplacement), 1705A.3.6 (Placing Record), and 1910A.
 - 2. Batch Plant or Weighmaster Inspection: CBC 1705A.3.3.
 - a. Waiver of Batch Plant Inspection:
 - 1) Batch plant inspection may be waived if the concrete plant complies fully with the requirements of CBC 1705A.3.3 subject to approval of DSA complying with either of these conditions:
 - (a) The plant must comply fully with the requirements of [ASTM C94/C94M](#), Sections 8 and 9, and has a current certificate from the National Ready Mixed Concrete Association or another agency acceptable to the enforcement agency. The certification shall indicate that the plant has automatic batching and recording capabilities.
 - b. Prior to waiving of batch plant inspection, the testing lab must certify and submit evidence of compliance to the Architect and DSA and obtain agency approval prior to mixing concrete.
 - 1) Qualified technician of the testing laboratory shall check the first batching at the start of the day.
 - 2) Licensed weigh-master to positively identify materials as to quantity and certify to each load by a batch ticket.
 - 3) Batch tickets, including material quantities and weights shall accompany the load, shall be transmitted to the Inspector of

Record by a truck driver with load identified thereon. The load shall not be placed without a batch ticket identifying the mix.

The inspector will keep a daily record of placements, identifying each truck, its load and time of receipt, and approximate location of deposit in the structure and will transmit a copy of the daily record to the enforcement agency.

- B. Reinforcing Steel, Including: Verify compliance with approved contract documents and [ACI 318](#), Sections 20.2, 25.2 through 25.6, and 26.6.
1. Reinforcing Bars: CBC 1901A.6; 1910A.
 2. Tests:
 - a. Tests shall be performed before the delivery of steel to Project site. Steel not meeting specifications shall not be shipped to the Project.
 - b. Testing procedure shall conform to [ASTM A615/A615M](#) or [ASTM A706/A706M](#).
 - c. Sample at the place of distribution, before shipment:
 - 1) Make one tensile test and one bending test from samples out of 10 tons, or fraction thereof, of each size and kind of reinforcing steel, where taken from bundles as delivered from the mill and properly identified as to heat number.
 - 2) Mill analysis shall accompany report.
 - 3) Where identification number cannot be ascertained, or where random samples are taken, make one series of tests from each 2-1/2 tons, or fraction thereof, of each size and kind of reinforcing steel.
 - 4) Tests on unidentified reinforcing steel will be paid by the District and backcharged to the Contractor.
 - 5) Samples shall include not fewer than 2 pieces, each 18 inches long, of each size and kind of reinforcing steel.
 - d. District's Inspector will inspect all reinforcement for concrete work for size, dimensions, locations and proper placement.
- C. Reinforcing Bar Welding: Verify compliance with [AWS D1.4/D1.4M](#) and [ACI 318](#), 26.6.4; continuous.
1. Verify weldability of reinforcing bars other than those complying with [ASTM A706/A706M](#); periodic.
 2. Inspect single-pass fillet welds, maximum 5/16 inch; periodic.
 3. Inspect all other welds; continuous.
 4. Reinforcing Bar Welding Inspection: CBC 1705A.3.1; Table 1705A.3, Item 2; 1903A.8.
- D. Bolts Installed in Concrete: Where allowable loads have been increased or where strength design is used, verify compliance with approved Contract Documents and [ACI 318](#) approved report prior to and during placement of concrete; continuous.

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1. Comply with CBC Section 1910A.5; Table 1705A.3, items 4a & 4b, [ASCE 7](#), Section 13.4, and DSA Bulletin 14-02, 2/20/14.
- E. Anchors Installed in Hardened Concrete: Verify compliance with [ACI 318](#); periodic.
- F. Design Mix: Verify plastic concrete complies with the design mix in approved contract documents and with [ACI 318](#), Chapter 19A, 26.4.3, 26.4.4; periodic.
 1. Portland Cement Tests: CBC 1705A.3.2, 1910A.
 2. Concrete Aggregates: CBC 1705A.3.2, 1903A.5.
 3. Batch Plant Inspection: CBC 1705A.3.2.
 4. Waiver of Batch Plant Inspection and Tests: CBC 1705A.3.3.
 5. Admixtures: CBC 1910A.1.
- G. Concrete Sampling Concurrent with Strength Test Sampling: Each time fresh concrete is sampled for strength tests, verify compliance with [ASTM C172/C172M](#), [ASTM C31/C31M](#) and [ACI 318](#), Chapter 26.5, 26.12, and record the following, continuous:
 1. Slump.
 2. Air content.
 3. Temperature of concrete.
 4. Strength Tests of Concrete: CBC 1905A.1.16; Table 1705A.3 Item 6; ACI 318-14 Sec. 26.13..
- H. Concrete and Shotcrete Placement: Verify application techniques comply with approved Contract Documents and [ACI 318](#), Chapter 26.5; continuous.
- I. Specified Curing Temperature and Techniques: Verify compliance with 1, Chapter 26.5.3-26.5.5; continuous.
- J. Specified Curing Temperature and Techniques: Verify compliance with approved contract documents and [ACI 318](#), Sections 5.11 through 5.13; continuous.
- K. Concrete Strength in Situ: Verify concrete strength complies with approved Contract Documents, CBC Table 1705A.3, and modified [ACI 318](#), Chapter 26.12.2,1(a).
- L. Concrete Strength in Situ: Verify concrete strength complies with approved contract documents, CBC Table 1705A.3 and ACI 318,Section 6.2, for the following.
- M. Formwork Shape, Location and Dimensions: Verify compliance with approved Contract Documents and [ACI 318](#), Chapter 26.11.1.2(b); periodic.
- N. Materials: If the Contractor cannot provide sufficient data or documentary evidence that concrete materials conform to the quality standards of [ACI 318](#), the AHJ will require that the Special Inspector verify compliance with the appropriate standards and criteria in [ACI 318](#), Chapter 3. CBC 1705A3.
- O. District Inspector (IOR) will do the following:
 1. Inspect placing of reinforcing steel and concrete at Project.

2. Obtain weighmaster's certificate and identify mix before accepting each load.
3. Keep daily record of concrete placement, identifying each truck load, time of receipt, and location of concrete in structure.
4. Keep record until completion of Project and make available for inspection by DSA Field Engineer or representative.
5. See also subparagraph on Waiver of Batch Plant Inspection above.
6. During progress of work, take an additional number of test cylinders as directed by Architect. Conform to CBC 1905A.1.16 (modified [ACI 318](#)). Test cylinders need not be made for concrete used in exterior flatwork.
 - a. [ACI 318](#) Section 26.12.2.1 shall be replaced and the Contractor shall comply with the following:
 - 1) Samples for strength test of each class of concrete placed each day shall not be taken less than once for each 50 cubic yards (38.3m³) of concrete, or not less than once for each 2,000 square feet (186 m²) of surface area of for slabs or walls.
 - 2) Additional samples for seven day compressive strength tests shall be taken for each class of concrete at the beginning of the concrete work or whenever the mix or aggregate is changed.
7. One set of cylinders shall consist of 4 samples all taken from same batch, one to be tested at age of 7 days and two at 28 days.
8. Make and store cylinders according to [ASTM C31/C31M](#).
9. Deliver cylinders to laboratory or store cylinders in a suitable protected environment for pick up by laboratory personnel.
10. Make slump test of wet concrete according to test for slump of portland cement concrete, [ASTM C143/C143M](#), at least at the same frequency that the cylinders are taken.

3.3 SPECIAL INSPECTIONS FOR SOILS

- A. Materials and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
 1. Design bearing capacity of material below shallow foundations; periodic.
 2. Design depth of excavations and suitability of material at bottom of excavations; periodic.
 3. Materials, densities, lift thicknesses; placement and compaction of backfill: continuous.
 4. Subgrade, prior to placement of compacted fill verify proper preparation; periodic.
- B. Testing: Classify and test excavated material; periodic.
- C. Excavations, Foundations and Retaining Walls (Chapters 17A, 18A, and 33):

1. Earth Compaction: CBC 1705A.6; Table 1705A.6, continuous; 1804A.6.
 2. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of compacted fill: CBC 1705A.6.1; Table 1705A.6, periodic; 1804A.6.
- D. The Geotechnical Engineer of record or a Geotechnical Engineer selected by the District will provide continuous inspection of fill and will field test fill and earth backfill as placed and compacted, and inspect excavations and subgrade before concrete is placed and provide periodic inspection of open excavations, embankments, and other cuts or vertical surfaces of earth.
1. The Geotechnical Engineer will submit a Verified Report indicating observations, tested fills, and opinion the fills were placed in accordance with the project specifications.
- E. Contractor shall remove unsatisfactory material, re-roll, adjust moisture, place new material, or in the case of excavations, provide proper protective measures, perform other operations necessary, as directed by the Geotechnical Engineer whose decisions and directions will be considered final.
- F. Soils Test and Inspection Procedure:
1. Allow sufficient time for testing, and evaluation of results before material is needed. The Geotechnical Engineer shall be sole and final judge of suitability of all materials.
 2. Laboratory compaction tests to be used will be in accordance with [ASTM D1557](#).
 3. Field density tests will be made in accordance with [ASTM D1556/D1556M](#).
 4. Number of tests will be determined by Geotechnical Engineer. Materials in question may not be used pending test results.
 5. Excavation and embankment inspection procedure. Geotechnical Engineer will visually or otherwise examine such areas for bearing values, cleanliness and suitability.
 6. Earthwork Test Reports: In order to avoid misinterpretations by the reviewing agencies, all retest results shall be reported on the same sheet, immediately following the previous failure test to which it is related. Retests shall be clearly noted as such.

3.4 SPECIAL INSPECTIONS FOR FIRE RESISTANT PENETRATIONS AND JOINTS

- A. Verify penetration firestops in accordance with [ASTM E2174](#).
- B. Verify fire resistant joints in accordance with [ASTM E2393](#).
- C. Inspection: Comply with CBC 1705A.17.

3.5 SPECIAL INSPECTIONS FOR FIRE DOOR ASSEMBLIES

- A. Per [NFPA 80](#) 5.2.1:
 1. Provide a third party inspector not associated with the construction, supply or installation of this project to develop a field survey of the doors and hardware.

2. Survey is to be done by a member certified as a FDAI (Fire Door Assembly Inspector), Certified AHC (Architectural Hardware Consultant) or a certified testing laboratory: UL or Intertek.
3. Certified Inspectors may be found at DHI.org, Intertek, or CAFDI.org.

3.6 SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE

- A. Architectural Components: Erection and fastening of components below; periodic.
 1. Exterior cladding; per ICC ESR Report when applicable.
 2. Interior and exterior veneer.
 3. Interior and exterior non-loadbearing walls and partitions.
 4. Suspended ceiling systems and their anchorage, per ICC ESR Report. CBC Section 1705A.12.5 and 1705A.13.2.
- B. Mechanical and Electrical Components:
 1. Anchorage of electric equipment required for emergency or standby power systems; periodic.
 2. Installation and anchorage of other electrical equipment; periodic.
 3. Vibration isolation systems where the approved Contract Documents require a nominal clearance of 1/4 inch or less between support frame and seismic restraint; periodic.
- C. Structural Observations for Seismic Resistance: Visually observe structural system for general compliance with the approved Contract Documents; periodic.

3.7 SPECIAL INSPECTIONS FOR WIND RESISTANCE

- A. Structural Wood:
 1. Nailing, bolting, anchoring and other fastening of components within the main wind force-resisting system; periodic.
- B. Wind Resisting Components:
 1. Roof covering, roof deck, and floor framing connections; periodic.
 2. Exterior wall covering and wall connections to roof and floor diaphragms and framing; periodic.

3.8 SPECIAL ARCHITECTURAL INSPECTIONS

- A. Signs and/or identification devices:
 1. Prior to issuance of a final Certificate of Occupancy, Enforcing Agency shall verify installation of signs for information content, appearance, location and Braille per CBC 11B-703.1.1.2.
 - a. Inspection shall include, but not limited to:

- 1) Braille dots and cells are properly spaced and the size proportion and type raised characters are in compliance with these regulations.
 - 2) Tactile exit signage per CBC 1013.4 and 11B-216.4.1 Exit doors.
 - 3) Sanitary facilities signage per CBC 11B-216.8 Toilet rooms and bathing rooms; and 11B-703.7.2.6 Toilet and bathing facilities geometric symbols.
- B. Water-resistive barrier coating:
1. Installation over sheathing substrate per [ASTM E2570/E2570M](#).
- C. Glass and glazing identification:
1. Verify installation of manufacturer's material mark inspection per CBC 2403.1.
 - a. Safety glazing shall be labeled per CBC 2406.3.

3.9 OTHER SPECIAL INSPECTIONS

- A. Provide for special inspection of work that, in the opinion of the AHJ, is unusual in nature.
- B. For the purposes of this section, work unusual in nature includes, but is not limited to:
1. Construction materials and systems that are alternatives to materials and systems prescribed by the building code.
 2. Materials and systems required to be installed in accordance with the manufacturer's instructions when said instructions prescribe requirements not included in the building code or in standards referenced by the building code.
- C. Alternative Test Procedures: Where approved rules and standards do not exist, test materials and assemblies as required by AHJ or provide AHJ with documentation of quality and manner in which those materials and assemblies are used.

3.10 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

- A. Special Inspection Agency shall:
1. Verify samples submitted by Contractor comply with the referenced standards and the approved Contract Documents.
 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 3. Perform specified sampling and testing of products in accordance with specified reference standards.
 4. Ascertain compliance of materials and products with requirements of Contract Documents.
 5. Promptly notify Architect, SEOR, IOR, DSA, District and Contractor of observed irregularities or non-conformance of work or products.
 6. Perform additional tests and inspections required by Architect.
 7. Submit reports of all tests or inspections specified.
- B. Limits on Special Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the work.
- C. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.11 TESTING AGENCY DUTIES AND RESPONSIBILITIES

- A. Testing Agency Duties:
1. Test samples submitted by Contractor.
 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 3. Perform specified sampling and testing of products in accordance with specified standards.
 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
 6. Perform additional tests and inspections required by Architect.
 7. Attend preconstruction meetings and progress meetings.
 8. Submit reports of all tests or inspections specified.
- B. Limits on Testing or Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the work.
- C. Immediately upon determination of a test failure, the Laboratory shall telephone the results to the Architect. On the same day, Laboratory shall send test results by email to the Architect and to all relevant responsible parties of the project team, and District's Inspector

- D. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.
- E. Contractor will pay for re-testing required because of non-compliance with specified requirements.
- F. At the completion of the project, Testing Laboratory shall certify in writing and on all required DSA forms, that all work specified or required to be tested and inspected conforms to drawings, specifications and applicable building codes.
 - 1. See DSA Procedure PR 13-01.
- G. Duties of the Laboratory of Record related to the use of form DSA 152 are as follows:
 - 1. Meet with the Project Inspector, design professionals, and contractor as needed to mutually communicate and understand the testing and inspection program and the methods of communication appropriate for the project.
 - 2. Obtain a copy of the DSA approved construction documents from the design professional in general responsible charge prior to the commencement of construction
 - 3. Obtain a copy of the DSA approved Statement of Structural Tests and Special Inspections (form DSA 103) from the design professional in general responsible charge prior to the commencement of construction.
 - 4. Report all project related activities to the Project Inspector. The Project Inspector is responsible for monitoring the work of the Laboratory of Record and Special Inspectors to ensure the testing and special inspection program is satisfactorily completed
 - 5. Provide material testing as identified in the DSA approved construction documents.
 - 6. Submit test reports to the Project Inspector on the day the tests were performed for any tests performed on-site
 - 7. Submit material test reports in a timely manner such that construction is not delayed and not to exceed 14 days from the date the material tests were performed. Test reports are to be submitted to DSA, the Architect, structural engineer, Project Inspector and school district.
 - a. As a convenience, and if agreed upon by involved parties, the test reports may be submitted electronically as identified in Section 4 of this procedure.
 - 8. Immediately submit reports of material tests not conforming to the requirements of the DSA approved construction documents. These reports shall be submitted to the DSA, Architect, structural engineer, Project Inspector and school district.
 - 9. The Engineering Manager shall submit an interim Laboratory of Record Verified Report (form DSA 291) and the Geotechnical Engineer shall submit an interim Geotechnical Verified Report (form DSA 293) to DSA, the project inspector, school district and the Design Professional in General Responsible Charge.

- a. The reports are required to be submitted upon any of the following events occurring:
 - 1) Within 14 days of the completion of the material testing/special inspection program.
 - 2) Work on the project is suspended for a period of more than one month.
 - 3) The services of the laboratory of record are terminated for any reason prior to completion of the project.
 - 4) The DSA requests a Verified Report. (See interim verified reports below. This is a "DSA request.")
- 10. The Engineering Manager shall submit an interim verified report (form DSA 291) and the Geotechnical Engineer shall submit form DSA 293 to DSA and a copy to the project inspector for each of the applicable sections of the form DSA 152, prior to the project inspector signing off that section of the project inspection card, if that section required material testing. The sections are:
 - a. Initial Site Work
 - b. Foundation Prep
 - c. Vertical Framing
 - d. Horizontal Framing
 - e. Appurtenances
 - f. Finish Site Work
 - g. Other Work
 - h. Final
- H. Duties of Special Inspectors, employed by the Laboratory of Record, related to the use of form DSA 152 are as follows:
 - 1. Meet with the Project Inspector, design professionals, and contractor as needed to mutually communicate and understand the testing and inspection program and the methods of communication appropriate for the project.
 - 2. Report all project related activities to the Project Inspector. The Project Inspector is responsible for monitoring the work of the Laboratory of Record and Special Inspectors to ensure the testing and special inspection program is satisfactorily completed.
 - 3. Perform work under the supervision of the Engineering Manager for the Laboratory of Record
 - 4. Perform inspections in conformance with the DSA approved construction documents, applicable codes and code reference standards
 - 5. Prepare detailed daily inspection reports outlining the work inspected and provide the Project Inspector a copy of the reports on the same day the inspections were performed.

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6. Prepare detailed daily inspection reports outlining the work inspected and provide the Project Inspector a copy of the reports on the same day the inspections were performed.
 7. Immediately submit reports of materials or work not conforming to the requirements of the DSA approved construction documents. These reports shall be submitted to the DSA, Architect, structural engineer, Project Inspector and school district.
 8. Submit daily special inspection reports in a timely manner such that construction is not delayed and not to exceed 14 days from the date the special inspections were performed. The reports are to be submitted to the Architect, structural engineer, Project Inspector and school district.
 9. Submit Verified Report forms DSA 292 to the DSA, Project Inspector, district and design professional in responsible charge.
 10. The reports are required to be submitted upon any of the following events occurring:
 11. Within 14 days of the completion of the special inspection work.
 12. Work on the project is suspended for a period of more than one month.
 13. The services of the special inspector are terminated for any reason prior to completion of the project.
 14. The DSA requests a Verified Report. (See interim verified reports below. This is a "DSA request")
 15. Submit an interim Verified Report (form DSA 292) to the DSA and a copy to the Project Inspector for each of the applicable sections of the form DSA 152, prior to the Project Inspector signing off that section of the project inspection card, if that section required special inspections. The sections are:
 - a. Initial Site Work
 - b. Foundation
 - c. Vertical Framing
 - d. Horizontal Framing
 - e. Appurtenances
 - f. Non-Building Site Structures
 - g. Finish Site Work
 - h. Other Work
 - i. Final
 16. The Verified Reports shall be sent electronically to the DSA.
- I. Duties of Special Inspectors, not employed by the Laboratory of Record, related to the use of form DSA 152 are as follows:
1. Meet with the project inspector, Laboratory of Record, the design professionals, and the contractors as needed to mutually communicate and understand the testing and inspection program, and the methods of communication appropriate for the project.

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2. Report all project related activities to the project inspector. The project inspector is responsible for monitoring the work of the Laboratory of Record and special inspectors to ensure the testing and special inspection program is satisfactorily completed.
3. Perform work under the direction of the design professional in general responsible charge, as defined in Section 4-335(f)1B of the California Administrative Code (Title 24, Part 1).
4. Perform inspections in conformance with the DSA approved construction documents, applicable codes and code reference standards.
5. Prepare detailed daily inspection reports outlining the work inspected and provide the project inspector a copy of the reports on the same day the inspections were performed.
6. Immediately submit reports of materials or work not conforming to the requirements of the DSA approved construction documents. These reports shall be submitted to DSA, the Architect, structural engineer, project inspector and the school district.
7. Submit daily special inspection reports in a timely manner such that construction is not delayed and not to exceed 14 days from the date the special inspections were performed. The reports are to be submitted to DSA, the Architect, structural engineer, project inspector and the school district.
8. Submit Special Inspection Verified Report forms DSA 292 to DSA, the project inspector, the school district and the Design Professional in General Responsible Charge.
 - a. The reports are required to be submitted upon any of the following events occurring:
 - 1) Within 14 days of the completion of the special inspection work.
 - 2) Work on the project is suspended for a period of more than one month.
 - 3) The services of the special inspector are terminated for any reason prior to completion of the project.
 - 4) DSA requests a verified report. (See interim verified reports below. This is a "DSA request.")
9. Submit an interim Special Inspection Verified Report (form DSA 292) to DSA and a copy to the project inspector for each of the applicable sections of the form DSA 152, prior to the project inspector signing off that section of the project inspection card, if that section required special inspections.
 - a. The sections are:
 - 1) Initial Site Work
 - 2) Foundation Prep
 - 3) Vertical Framing
 - 4) Horizontal Framing
 - 5) Appurtenances
 - 6) Finish Site Work

- 7) Other Work
- 8) Final

3.12 CONTRACTOR DUTIES AND RESPONSIBILITIES

A. DSA Requirements:

1. Each Multi-Prime Contractor or Subcontractor shall comply with DSA Construction Oversight Procedure PR 13-01. California Code of Regulations (CCR), Title 24, Part 1, CCR, Chapter 4, Article 1 (Sections 4-211 through 4-220) and Group1, Articles 5 and 6 (Sections 4-331 through 4-344) which provide regulations governing the construction process for projects under the jurisdiction of the Division of the State Architect (DSA).
 - a. Assist the Project Inspector (IOR) and complete and fill out the following forms during the course of construction.
 - 1) Form-102-IC: Construction Start Notice/ Inspection Card Request: Verify Project Inspector has an active form issued by DSA.
 - 2) Form-151: Project Inspector Notifications: Contractor to notify IOR and assist.
 - 3) Form-152: Project Inspection Card: See below.
 - 4) Form-154: Notice of Deviations/ Resolution of Deviations: Contractor to verify all deviations are reviewed, corrected, and accepted by the design professional, and filed with DSA through the Project Inspector (IOR).
 - (a) When the Project Inspector identifies deviations from the DSA approved construction documents the inspector must verbally notify the contractor. If the deviations are not corrected within a reasonable time frame, the inspector is required to promptly issue a written notice of deviation to the contractor, with a copy sent to the design professional in general responsible charge and the DSA.
 - (b) When the noticed deviations are corrected, the inspector is required to promptly issue a written notice of resolution to the contractor, with a copy sent to the design professional in general responsible charge and the DSA.
 - (c) Deviations include both construction deviations and material deficiencies.
 - (d) The written notice of deviations shall be made using form DSA 154.
 - (e) The notice of resolution of deviations shall be made using the original form DSA 154 that reported the deviations.
 - 5) Form-156: Commencement/Completion of Work Notification

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- 6) Form-6.C: Verified Report – Contractor: From each contractor having a contract with the school board.
2. Duties of Contractor related to the use of form DSA 152 are as follows:
 - a. The Contractor shall carefully study the DSA approved documents and shall plan a schedule of operations well ahead of time.
 - b. If at any time it is discovered that work is being done which is not in accordance with the DSA approved construction documents, the Contractor shall correct the work immediately.
 - c. Verify that forms DSA 152 are issued for the project prior to the commencement of construction.
 - d. Meet with the design team, the Laboratory of Record and the Project Inspector to mutually communicate and understand the testing and inspection program and the methods of communication appropriate for the project.
 - e. Notify the Project Inspector, in writing, of the commencement of construction of each and every aspect of the work at least 48 hours in advance by submitting form DSA 156 (or other agreed upon written documents) to the Project Inspector.
 - f. Notify the Project Inspector of the completion of construction of each and every aspect of the work by submitting form DSA 156 (or other agreed upon written documents) to the Project Inspector.
 - g. Consider the relationship of the signed off blocks and sections of the form DSA 152 and the commencement of subsequent work. Until the Project Inspector has signed off applicable blocks and sections of the form DSA 152, the Contractor may be prohibited from proceeding with subsequent construction activities that cover up the unapproved work. Any subsequent construction activities, that cover up the unapproved work, will be subject to a “Stop Work Order” from the DSA or the district and are subject to removal and remediation if found to be in non-compliance with the DSA approved construction documents.
 - h. Submit the final verified report. All prime contractors are required to submit final Contractor Verified Reports (form DSA 6-C) to DSA and the project inspector.
 - 1) The reports are required to be submitted upon any of the following events occurring:
 - (a) The project is substantially complete. DSA considers the project to be complete when the construction is sufficiently complete in accordance with the DSA approved construction documents so that the owner can occupy or utilize the project.

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- (b) Work on the project is suspended for a period of more than one month.
 - (c) The services of the contractor are terminated for any reason prior to the completion of the project.
 - (d) DSA requests a verified report.
- B. Contractor Responsibilities, General:
 - 1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
 - 2. Availability of Samples
 - a. Contractor shall make materials required for testing available to Laboratory and assist in acquiring these materials as directed by the District's Inspector. The samples shall be taken under the immediate direction and supervision of the Testing Laboratory or District's Inspector.
 - b. If work which is required to be tested or inspected is covered up without prior notice or approval, such work may be uncovered at the discretion of Architect at no additional cost to the District. Refer to paragraph "Payments" herein.
 - c. Unless otherwise specified, Contractor shall notify Testing Laboratory a minimum of 10 working days in advance of all required tests, and a minimum of 2 working days in advance of all required inspections. All extra expenses resulting from a failure to notify the Laboratory will be paid by the District and backcharged to the Contractor.
 - d. Contractor shall give sufficient advance notice to Testing Laboratory in the event of cancellation or time extension of a scheduled test or inspection. Charges due to insufficient advance, notice of cancellations, or time extension will be paid for by the District and backcharged to the Contractor.
 - 3. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
 - 4. Provide incidental labor and facilities:
 - a. To provide access to work to be tested or inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
 - c. To facilitate tests or inspections.
 - d. To provide storage and curing of test samples.
 - 5. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
 - 6. Arrange with District's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 7. The Contractor shall notify the District's Inspector a minimum of 5 working days in advance of the manufacture of material to be supplied by him under the Contract

Documents, which must be by terms of the Contract be tested, in order that the District may arrange for the testing of such material at the source of supply.

8. Material shipped by the Contractor from the source of supply before having satisfactorily passed such testing and inspection or before the receipt of notice from said Inspector that such testing and inspection will not be required, shall not be incorporated in the Project.
 9. The District will select and pay testing laboratory costs for all tests and inspections, but may be reimbursed by the Contractor for such costs under the Contract conditions. Any direct payments by the Contractor to the testing laboratory on this project is prohibited.
- C. Contractor shall submit a written statement of responsibility to comply with CBC section 1704A.4.
1. Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:
 - a. Acknowledgment of awareness of the special requirements contained in the statement of special inspections;
 - b. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official;
 - c. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and
 - d. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.
- D. Contractor Responsibilities, Seismic Force-Resisting System, Designated Seismic System, and Seismic Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and District prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.
- E. Contractor Responsibilities, Wind Force-Resisting System and Wind Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and District prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.
- F. Unless otherwise directed, materials not conforming to the requirements of Contract Documents shall be promptly removed from the Project site.

3.13 MANUFACTURERS' AND FABRICATORS' FIELD SERVICES

- A. When specified in individual specification sections, require material suppliers, assembly fabricators, or product manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of

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CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

equipment, to test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
 - 1. Observer subject to approval of Architect.
 - 2. Observer subject to approval of District.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

END OF SECTION

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SECTION 01 50 00 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish and install all required temporary facilities as shown or specified herein plus such facilities as required for proper performance of the Contract. All such temporary facilities shall be located where directed and maintained in a safe and sanitary condition at all times until completion of the Contract. The Conditions of the Contract and the other sections of Division 1 apply to this section as fully as if repeated herein.

1.2 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with governing regulations and utility company regulations and recommendations.
- B. Comply with pollutions and environmental protection regulations for use of water and energy, for discharge of wastes and storm drainage from project site, and for control of dust, air pollution and noise.
- C. Temporary work shall conform to all the requirements of State, County, and local authorities and underwriters which pertain to operation, health, safety, and fire hazard. Contractor shall furnish and install all items necessary for conformity with such requirements, whether or not called for under the separate divisions of these specifications.

PART 2 – PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 TEMPORARY SANITARY FACILITIES

- A. Provide temporary sanitary facilities to serve all construction workers on site. No contractors are allowed to utilize existing restrooms.

3.2 TEMPORARY ELECTRIC FACILITIES

- A. Contractor to Provide and maintain during the progress of the work all electrical lighting and power requirements to facilitate the work of all trades and services connected with the work. Lighting levels shall be adequate to permit workmen to properly perform their work, to permit detection of flaws in finishes, and to allow for reading of specifications.

3.3 TEMPORARY WATER

- A. Contractor to Provide for all water required for construction purposes and for testing, disinfection and flushing of the water supply system. Furnish and install piping or hose to carry water to every point where needed on the project. All water used on the project shall be potable water. Closest availability of water shall be determined by the Contractor.

3.4 TEMPORARY HEATING AND VENTILATING

- A. Provide all temporary heat as necessary for the drying out of the building, the proper installation of all work and materials, and the protection of all work and materials against injury from dampness and cold.

3.5 CONSTRUCTION EQUIPMENT

- A. Contractor shall erect, equip, and maintain construction equipment in strict accordance with applicable statutes, laws, ordinances, rules and regulations of authority having jurisdiction.
- B. Contractor shall provide, maintain and remove upon completion of the work all temporary rigging, scaffolding, hoisting equipment, rubbish chutes, ramps, stairs, runways, platforms, ladders, railings, and other temporary work as required for all work hereunder.

3.6 FENCES AND BARRICADES

- A. Prior to start of work at the project site, install a 6-foot high chain link fence or solid plywood and wood frame enclosure fence with locked entrance gates. Locate the fence to enclose substantially the entire project site, or that portion the Contractor establishes as required to encompass the entire project construction operation.
- B. Construct and maintain planking, barricades, lights, and warning signs as required by local authorities and State safety ordinances, and as necessary for the protection of the public. Provide walks around obstructions made in a public place for carrying on the work covered in this contract. Leave protection in place and maintain in good condition until removal is authorized.
- C. Provide barriers to protect trees and plants on the site and immediately adjacent to the site which are designated to remain. Construct temporary barriers to a height of 6 feet around each tree or plant, or each group of trees or plants.

3.7 STORAGE

- A. Operations of the Contractor, including storage of materials, shall be confined to areas approved. Contractor shall be liable for damage caused by him during such use of property of the Owner or other parties. Contractor shall save the Owner, its officers and agents, and the Architect and his employees free and harmless from liability of any nature or kind arising from any use, trespass, or damage occasioned by his operations on premises of third persons. Storage facilities shall provide protection of products from excessive cold, heat, moisture, humidity or physical abuse as specified in the respective sections for the products stored.

3.8 TEMPORARY JOB OFFICE

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Locate offices at a minimum distance of 30 feet from existing and new structures.

3.9 TEMPORARY OFFICE FOR OWNERS INSPECTOR

- A. Office: Minimum size 10'x20'. Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
- B. Locate office at a minimum distance of 30 feet from existing and new structures.

3.10 PROJECT SIGN

A. N/A

3.11 REMOVAL AT COMPLETION

A. N/A

END OF SECTION

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SECTION 01 57 00- TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Water Control
- B. Dust Control
- C. Erosion and Sediment Control
- D. Noise Control
- E. Pollution Control

1.2 WATER CONTROL

- A. Do not permit surface or subsurface water or other liquids to accumulate in or about the premises and vicinity thereof. Should such conditions be encountered or develop, control the water or other liquid and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams or other methods as approved by the Architect and/or the authority having jurisdiction.

1.3 DUST CONTROL

- A. Conduct earthwork operations in a manner to prevent windblown dust and dirt from interfering with the progress of the Work, the Owner's activities and the existing occupied structures in the areas immediately adjacent as well as adjacent properties.
- B. Periodically water construction areas as required to minimize accumulation of dust and dirt.
- C. Water spray or cover with tarpaulins truckloads of soil to additionally minimize generation of dust and dirt from construction operations.
- D. Prevent dust and dirt from accumulating on walks, roadways, parking areas and from washing into sewer and storm drain lines.

1.4 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize amount of bare soil exposed at one time.
- C. Provide temporary measures such as berms, dikes and drains to prevent water flow over adjacent properties or City rights-of-way.
- D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.5 NOISE CONTROL

- A. Avoid excessive noise where adjacent operations may be detrimentally affected.
- B. Provide sound blankets/acoustic barriers in coordination with the Owner as needed as part of phasing and fencing plan.

1.6 POLLUTION CONTROL

- A. Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.
- B. Burning of refuse, debris or other materials will not be permitted on the Site.
- C. Comply with regulatory requirements and anti-pollution ordinances during the course of construction and disposal operations.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 REMOVAL

- A. Remove all temporary control measures in accordance with regulatory requirements at the completion of construction.

END OF SECTION

SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. General product requirements.
 - 1. System Completeness.
 - 2. Installation of Products.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations.
- E. Procedures for District-supplied products.
- F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
- B. Section 01 74 00 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging, and substitutions.

1.3 REFERENCE STANDARDS

- A. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; 2017, v1.2.
- B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
 - 1. Use California Electrical Code.

1.4 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 15 days after date of Agreement.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

1.5 QUALITY ASSURANCE

- A. CAL (CDPH SM) v1.1: California Department of Public Health (CDPH) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, v. 1.1–2010, for the emissions testing and requirements of products and materials.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Drawings and Specifications:
 1. If a conflict exists between the Drawings and the Specifications (Project Manual), then the Contractor shall submit a Request for Interpretation from the Architect. See Section 01 30 00 - Administrative Requirements.
 - a. As noted in the General Conditions, the more stringent requirements shall govern, including cost of materials and/or installation.
 2. If a specific product is indicated on the Drawings for use, then that product shall be used without exception in the location identified.
 3. If the Contractor proposes the use of another product other than the item indicated, whether or not listed in these specifications, the Contractor shall submit the product using the complete substitution process. See Section 01 25 00 Substitutions.
 4. DSA (Division of the State Architect) approval is also required prior to the use or installation of any substitution, on any product or location of product (requiring a revision to the Drawings or Specifications), included in these construction documents.
 - a. Installation of a non-approved product may result in the Contractor removing and replacing the non-approved product at the Contractor's own expense. See Division 01 General Conditions.
- B. General: Items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock, and include materials, equipment, assemblies, fabrications and systems.
 1. Named Products: Items identified by manufacturer's product name, including make or model designations indicated in the manufacturer's published product data.
 2. Materials: Products that are shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed or installed to form a part of the Work.
 3. Equipment: A product with operating parts, whether motorized or manually operated, that requires connections such as wiring or piping.
- C. Specific Product Requirements: Refer to requirements of Section 01 60 00 – Product Requirements and individual product Specifications.
- D. Minimum Requirements: Specified requirements for products are minimum requirements.

- E. Standard Products:
 - 1. Where specific products are not specified, provide standard products of types and kinds that are suitable for the intended purposes and that are usually and customarily used on similar projects under similar conditions.
 - 2. Products shall be as selected by Contractor and subject to review and acceptance by the District and Architect.
- F. Product Completeness:
 - 1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
 - 2. Comply with additional requirements specified herein in Article titled "SYSTEM COMPLETENESS".
- G. Code Compliance:
 - 1. All products, other than commodity products prescribed by Code, shall have a current ICC Evaluation Service Research Report (ICC ESR), CABO National Evaluation Report (NER), or other testing agencies as accepted by the Division of the State Architect.
 - 2. Refer to additional requirements specified in Section 01 41 00 - Regulatory Requirements.

2.2 SYSTEM COMPLETENESS

- A. The Contract Drawings and Specifications are not intended to be comprehensive directions on how to produce the Work. Rather, the Drawings and Specifications are instruments of service prepared to describe the design intent for the completed Work.
- B. It is intended that all equipment, systems and assemblies be complete and fully functional even though not fully described. Provide all products and operations necessary to achieve the design intent described in the Contract Documents.
- C. Omissions and Misdescriptions: Contractor shall report to Architect immediately when elements essential to proper execution of the Work are discovered to be missing or misdescribed in the Drawings and Specifications or if the design intent is unclear.
 - 1. Should an essential element be discovered as missing or misdescribed prior to receipt of Bids, an Addendum will be issued so that all costs may be accounted for in the Contract Sum.
 - 2. Should an obvious omission or misdescription of a necessary element be discovered and reported after execution of the Agreement, Contractor shall provide the element as though fully and correctly described, and a no-cost Change Order shall be executed.
 - 3. Refer to related General Conditions or general requirements specified in Section 01 30 00 - Administrative Requirements and 01 31 13 - Project Coordination regarding construction interfacing and coordination.

2.3 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
 - 1. Provide products that fully comply with the Contract Documents, are undamaged and unused at installation.
 - 2. Comply with additional requirements specified herein in Article titled "PRODUCT OPTIONS".
- B. Use of products having any of the following characteristics is not permitted:
 - 1. Made outside the United States, its territories, Canada, or Mexico.
 - 2. Containing lead, cadmium, or asbestos.
- C. Where other criteria are met, Contractor shall give preference to products that:
 - 1. If used on interior, have lower emissions, as defined in Section 01 61 16.
 - 2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.
 - 3. Are extracted, harvested, and/or manufactured closer to the location of the project.
 - 4. Have longer documented life span under normal use.
 - 5. Result in less construction waste. See Section 01 74 00.
- D. Provide interchangeable components of the same manufacture for components being replaced.
 - 1. To the fullest extent possible, provide products of the same kind from a single source. Products required to be supplied in quantity shall be the same product and interchangeable throughout the Work.
 - 2. When options are specified for the selection of any of two or more products, provide product selected to be compatible with products previously selected.
- E. Product Nameplates and Instructions:
 - 1. Except for required Code-compliance labels and operating and safety instructions, locate nameplates on inconspicuous, accessible surfaces. Do not attach manufacturer's identifying nameplates or trademarks on surfaces exposed to view in occupied spaces or to the exterior.
 - 2. Provide a permanent nameplate on each item of service-connected or power-operated equipment. Nameplates shall contain identifying information and essential operating data such as the following example:
 - a. Name of manufacturer
 - b. Name of product
 - c. Model and serial number
 - d. Capacity
 - e. Operating and Power Characteristics
 - f. Labels of Tested Compliance with Codes and Standards
 - 3. Refer to additional requirements which may be specified in various sections, as included in this Project Manual.
 - 4. For each item of service-connected or power-operated equipment, provide

operating and safety instructions, permanently affixed and of durable construction, with legible machine lettering. Comply with all applicable requirements of authorities having jurisdiction and listing agencies.

- F. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
- G. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.4 PRODUCT OPTIONS

- A. Unless the specifications state that no substitution is permitted, whenever the Contract Documents indicate any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction or any specific name, make, trade name, or catalog number, with or without the words "or equal," such specification shall be deemed to be used for the purpose of facilitating description of the material, process, or article desired and shall be deemed to be followed by the words "or equal."
- B. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
 - 1. Reference Standards:
 - a. Where Specifications require compliance with a standard, provided product shall fully comply with the standard specified.
 - 2. Product Description:
 - a. Where Specifications describe a product, listing characteristics required, with or without use of a brand name, provide a product that has the specified attributes and otherwise complies with specified requirements.
 - 3. Performance Requirements:
 - a. Where Specifications require compliance with performance requirements, provide product(s) that comply and are recommended by the manufacturer for the intended application.
 - b. Verification of manufacturer's recommendations may be by product literature or by certification of performance from manufacturer.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
- D. Products Specified by Identification of Manufacturer and Product Name or Number:
 - 1. "Specified Manufacturer": Provide the specified product(s) of the specified manufacturer.
 - a. If only one manufacturer is specified, without "acceptable manufacturers" being identified, provide only the specified product(s) of the specified manufacturer.
 - b. If District standard is indicated make all efforts to provide that product.
 - c. If the phrase "or equal" or "approved equal" is stated or reference is

made to the "or equal provision," products of other manufacturers may be provided if such products are equivalent to the specified product(s) of the specified manufacturer.

2. "Acceptable Manufacturers":
 - a. Product(s) of the named manufacturers, if equivalent to the specified product(s) of the specified manufacturer.
 - 1) Exception: Considerations regarding changes in Contract Time and Contract Sum will be waived if no increase in Contract Time or Contract Sum results from use of such equivalent products.
 3. Unnamed manufacturers: Product(s) of unnamed manufacturers will be acceptable when disclosed during the bidding period and only as follows:
 - a. Unless specifically stated that substitutions will not be accepted or considered, the phrase "or equal" shall be assumed to be included in the description of specified product(s).
 - b. Equivalent products of unnamed manufacturers will be accepted in accordance with the "or equal" provision specified herein, below.
 4. Quality basis:
 - a. Specified product(s) of the specified manufacturer shall serve as the basis by which products by named acceptable manufacturers and products of unnamed manufacturers will be evaluated.
 - b. Where characteristics of the specified product are described, where performance characteristics are identified or where reference is made to industry standards, such characteristics are specified to identify the most significant attributes of the specified product(s) which will be used to evaluate products of other manufacturers.
- E. Products Specified by Combination of Methods: Where products are specified by a combination of attributes, including manufacturer's name, product brand name, product catalog or identification number, industry reference standard, or description of product characteristics, provide products conforming to all specified attributes.
- F. "Or Equal" Provision: Where the phrase "or equal" or the phrase "or approved equal" is included, equivalent product(s) of unnamed manufacturer(s) may be provided as specified above in subparagraph titled "Unnamed manufacturers" and Section 01 25 00 - Substitution Procedures with the following conditions:
1. Substitution Procedures shall apply to products provided under the "or equal" provision.
 - a. Exception: If the proposed product(s) are determined to be equivalent to the specified product(s) of the specified manufacturer, the requirement specified for substitutions to result in a net reduction in Contract Time or Contract Sum will be waived.
 2. Use of product(s) under the "or equal" provision shall not result in any delay in completion of the Work, including completion of portions of the Work for use by District or for work under separate contract by District.
 3. Use of product(s) under the "or equal" provision shall not result in any costs to the District, including design fees and permit and plan check fees.

4. Use of product(s) under the "or equal" provision shall not require substantial change in the intent of the design, in the opinion of the Architect.
 - a. The intent of the design shall include functional performance and aesthetic qualities.
 5. The determination of equivalence will be made by the Architect and District, and such determination shall be final.
- G. Visual Matching:
1. Where Specifications require matching a sample, the decision by the Architect on whether a proposed product matches shall be final.
 2. Where no product visually matches but the product complies with other requirements, comply with provisions for substitutions for selection of a matching product in another category.
- H. Visual Selection of Products:
1. Where requirements include the phrase "as selected from manufacturer's standard colors, patterns and textures", or a similar phrase, selections of products will be made by indicated party or, if not indicated, by the Architect. The will select color, pattern and texture from the product line of submitted manufacturer, if all other specified provisions are met.
 2. The Architect will select color, pattern and texture from the product line of submitted manufacturer, if all other specified provisions are met.

2.5 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 - EXECUTION

3.1 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
 1. Schedule delivery to minimize long-term storage and prevent overcrowding construction spaces.
 2. Coordinate with installation to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport products by methods to avoid product damage.
- F. Transport materials in covered trucks to prevent contamination of product and

littering of surrounding areas.

- G. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- H. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- I. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.2 STORAGE AND PROTECTION

- A. Provide protection of stored materials and products against theft, casualty, or deterioration.
- B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 00.
 - 1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.
- C. Inspection Provisions: Arrange storage to provide access for inspection and measurement of quantity or counting of units.
- D. Structural Considerations: Store heavy materials away from the structure in a manner that will not endanger supporting construction.
- E. Store and protect products in accordance with manufacturers' instructions.
- F. Store with seals and labels intact and legible.
- G. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.
- H. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- I. For exterior storage of fabricated products, place on sloped supports above ground.
 - 1. Place products on raised blocks, pallets or other supports, above ground and in a manner to not create ponding or misdirection of runoff.
- J. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- K. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
 - 1. Periodically inspect to ensure products are undamaged and are maintained under required conditions.
 - 2. Remove and replace products damaged by improper storage or protection with new products at no change in Contract Sum or Contract Time.
 - 3. Weather-Resistant Storage:
 - a. Store moisture-sensitive products above ground, under cover in a weathertight enclosure or covered with an impervious sheet

- covering. Provide adequate ventilation to avoid condensation.
- b. Maintain storage within temperature and humidity ranges required by manufacturer's instructions.
- c. Store loose granular materials on solid surfaces in a well-drained area. Prevent mixing with foreign matter.
- L. Comply with manufacturer's warranty conditions, if any.
- M. Do not store products directly on the ground.
- N. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- O. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- P. Prevent contact with material that may cause corrosion, discoloration, or staining.
- Q. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- R. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

3.3 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products, except where more stringent requirements are specified, are necessary due to Project conditions or are required by authorities having jurisdiction.
- B. Anchor each product securely in place, accurately located and aligned with other Work.
- C. Clean exposed surfaces and provide protection to ensure freedom from damage and deterioration at time of Substantial Completion review. Refer to additional requirements specified in General Conditions, Section 01 50 00 - Temporary Construction Facilities and Controls and 01 70 00 - Execution and Closeout Requirements.

3.4 PROTECTION OF COMPLETED WORK

- A. Provide barriers, substantial coverings and notices to protect installed Work from traffic and subsequent construction operations.
- B. Remove protective measures when no longer required and prior to Substantial Completion review of the Work.
- C. Comply with additional requirements specified in Section 01 50 00 - Temporary Construction Facilities and Controls.

END OF SECTION

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SECTION 01 61 16 - VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements for Indoor-Emissions-Restricted products.
- B. Requirements for VOC-Content-Restricted products.
- C. Requirement for installer certification that they did not use any non-compliant products.

1.2 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- B. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.
- C. Section 07 92 00 - Joint Sealants: Emissions-compliant sealants.

1.3 DEFINITIONS

- A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
 - 3. Flooring.
 - 4. Products making up wall and ceiling assemblies.
 - 5. Thermal and acoustical insulation.
 - 6. Other products when specifically stated in the specifications.
- B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Exterior and interior paints and coatings.
 - 2. Exterior and interior adhesives and sealants, including flooring adhesives.
 - 3. Wet-applied roofing and waterproofing.
 - 4. Other products when specifically stated in the specifications.
- C. Interior of Building: Anywhere inside the exterior weather barrier.
- D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

SECTION 01 61 16

VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

- F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
1. Concrete.
 2. Clay brick.
 3. Metals that are plated, anodized, or powder-coated.
 4. Glass.
 5. Ceramics.
 6. Solid wood flooring that is unfinished and untreated.

1.4 REFERENCE STANDARDS

- A. AHRI 340/360 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500 MM (12- to 60-in.) Diameter; 2013.
- B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2005 (Reapproved 2013).
- C. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; 2017, v1.2.
- D. CARB (ATCM) - Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products; California Air Resources Board; current edition.
- E. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2007.
- F. CHPS (HPPD) - High Performance Products Database; Current Edition at www.chps.net/.
- G. CRI (GL) - Green Label Testing Program - Certified Products; Current Edition.
- H. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Current Edition.
- I. GreenSeal GS-36 - Adhesives for Commercial Use; 2013.
- J. SCAQMD 1113 - Architectural Coatings; 1977 (Amended 2016).
- K. SCAQMD 1168 - Adhesive and Sealant Applications; 1989 (Amended 2017).
- L. SCS (CPD) - SCS Certified Products; Current Edition.
- M. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

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- C. Installer Certifications Regarding Prohibited Content: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of installer's products, or 2) that such products used comply with these requirements.
 - 1. Use the form following this section for installer certifications.
- D. Verification of compliance with VOC limits as specified in the CalGreen Code Section 5.504 shall be provided at the request of the Building Inspector.
 - 1. Product certification and specifications.
 - 2. Chain of custody certifications.
 - 3. Product, labeled and invoiced as meeting the Composite Wood Products regulation.
 - 4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards
 - 5. Other methods approved by the building official.

1.6 QUALITY ASSURANCE

- A. Indoor Emissions Standard and Test Method: CAL (CDPH SM), using Standard Private Office exposure scenario and the allowable concentrations specified in the method, and range of total VOC's after 14 days.
 - 1. Wet-Applied Products: State amount applied in mass per surface area.
 - 2. Paints and Coatings: Test tinted products, not just tinting bases.
 - 3. Evidence of Compliance: Acceptable types of evidence are the following;
 - a. Current UL (GGG) certification.
 - b. Current SCS (CPD) Floorscore certification.
 - c. Current SCS (CPD) Indoor Advantage Gold certification.
 - d. Current listing in CHPS (HPPD) as a low-emitting product.
 - e. Current CRI (GLP) certification.
 - f. Test report showing compliance and stating exposure scenario used.
 - 4. Product data submittal showing VOC content is NOT acceptable evidence.
 - 5. Manufacturer's certification without test report by independent agency is NOT acceptable evidence.
- B. VOC Content Test Method: AHRI 340/360 (EPA Method 24), or ASTM D3960, unless otherwise indicated.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
- C. Composite Wood Emissions Standard: CARB (ATCM) for ultra-low emitting

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formaldehyde (ULEF) resins.

- a. Current SCS "No Added Formaldehyde (NAF)" certification; www.scs-certified.com.
 - b. Report of laboratory testing performed in accordance with requirements.
 - c. Published product data showing compliance with requirements.
 - d. Certification by manufacturer that product complies with requirements.
- D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.7 REGULATORY REQUIREMENTS

- A. All VOC restricted products shall be compliant with local jurisdiction, South Coast Air Quality Management District, Air Pollution Control District, County of San Diego, and California Green Standards Code, Rules and Regulations in effect at the time of installation. Products specified in this project shall be used as a basis of design. Updated products that are compliant with the rules in force at the time of installation shall be submitted as substitutions when they become available.
1. If a product is found to be non-compliant with the VOC rules at the scheduled time of installation, notify the Architect a minimum of 90 days prior to installation. Contractor shall submit a suggested compliant product that is equal to the performance and cost of the specified product using the substitution procedure described in section 01 60 00 - Product Requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.
- B. Indoor-Emissions-Restricted Products: Comply with Indoor Emissions Standard and Test Method, except for:
- 1. Composite Wood, Wood Fiber, and Wood Chip Products: Comply with Composite Wood Emissions Standard or contain no added formaldehyde resins.
 - a. Comply with CalGreen Building Standards Section 5.504.4.5, Table 504.4.4.5 "Formaldehyde Limits".
 - 2. Inherently Non-Emitting Materials.
- C. VOC-Content-Restricted Products: VOC content not greater than required by the following:
- 1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
 - 2. Aerosol Adhesives: GreenSeal GS-36.
 - 3. Joint Sealants: SCAQMD 1168 Rule.
 - 4. Paints and Coatings: Each color; most stringent of the following:
 - a. AHRI 340/360.
 - b. SCAQMD 1113 Rule.

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VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

- c. CARB (SCM).
 - d. CalGreen Building Standards Section 5.504, Table 504.4.3 "VOC Content Limits for Architectural Coatings".
- 5. Wet-Applied Roofing and Waterproofing: Comply with requirements for paints and coatings.
- 6. Clear Wood Finishes, Floor Coatings, Stains, Primers and Shellacs: Do not exceed the VOC content limits established in 1 rule.
- 7. Carpet, Carpet Tile, and Adhesive: Provide products having VOC content not greater than that required for 1 certification.
 - a. Comply with CalGreen Building Standards Section 5.504, Table 504.4.1 "Adhesive VOC Limit".
- 8. Carpet Cushion: Provide products having VOC content not greater than that required for 1 certification.
 - a. Comply with CalGreen Building Standards Section 5.504, Table 504.4.1 "Adhesive VOC Limit".
- D. Other Product Categories: Comply with limitations specified elsewhere.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. District reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to District.
- B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

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SECTION 01 70 00 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Field engineering and surveying.
- B. Requirements and limitations for cutting and patching of Work.
- C. Cleaning throughout construction period.
- D. Project Record Documents.
- E. Closeout procedures.
- F. Adjusting
- G. Operation and maintenance data.
- H. Warranty and Guarantee.
- I. Spare parts and maintenance materials.
- J. Instruction to Owner's personnel.

1.2 FIELD ENGINEERING QUALITY CONTROL

- A. Employ Land Surveyor registered in the State of California and acceptable to Architect.
- B. Submit name, address and telephone number of Surveyor before starting survey work.
- C. Maintain complete and accurate log of control and survey Work as it progresses.
- D. On completion of foundation walls, floor slabs and major site improvements, prepare a certified survey illustrating dimensions, locations, angles and elevations of construction.

1.3 SURVEY REFERENCE POINTS

- A. Contractor to locate and protect survey control and reference points.
- B. Control datum for survey is that established by Owner provided survey.
- C. Protect survey control points prior to starting site Work; preserve permanent reference points during construction.
- D. Promptly report to the Architect loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to the Architect.

1.4 SURVEY REQUIREMENTS

- A. Provide field engineering services. Use recognized engineering survey practices.
- B. Establish a minimum of two permanent 3-inch diameter brass plate benchmarks on site referenced to established control points. Record locations, with horizontal and vertical data on Project Record Documents. Establish additional temporary bench marks at all floor levels.

- C. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means make use of laser instrumentation. Contractor shall arrange and pay for Field Engineering and Staking.
 - 1. Site improvements including pavements; stakes for grading, fill placement; utility locations, slopes, invert elevations and batter boards.
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, ground floor elevations.
 - 4. Floor elevations of existing structures that relate to project.
 - 5. Partition layouts on rough floor as a guide to all trades.
- D. Periodically verify layouts by same means.

1.5 LAYOUT MARKINGS

- A. Layout markings shall not be made with xylene-based inks, paint, or dyes, or with other solvent-based products that may bleed through finishes.

1.6 EXISTING CONDITIONS

- A. Before beginning Work, investigate and verify existence and location of mechanical, drainage, and electrical systems and other construction affecting Work, including underground utilities.
 - 1. Before construction, survey and record points of connection of utility services.
 - 2. Locate invert elevation at points of connection to existing sanitary- and storm drain, water-service piping, and underground electrical services.
 - 3. Employ a utility service locator company to locate underground utilities.
 - 4. Verify Owner's Record Drawings.
 - 5. Furnish survey of existing utilities.

1.7 CUTTING AND PATCHING

- A. Where Work requires that particular existing building element such as partition, wall, paving, window, or similar element of existing building construction be removed, it is the intention of this Specification that such Work be part of the Demolition Section and not part of Cutting and Patching.
- B. New Work required to replace such removals is considered as part of separate sections of Specifications covering similar new construction.
- C. Where incidental cutting and patching is required for installation of a specific item or piece of equipment (including piping, ductwork, conduit, etc.), such cutting and patching is considered to be specified as part of that Section.
- D. Contractor shall verify and check areas to be cut and patched and shall coordinate Work of various trades involved.
- E. Where doubt exists as to size, location, or method of cutting concrete or any other structural element, including metal stud framing, Contractor shall contact Architect before proceeding.

- F. Where doubt exists, Contractor shall distinguish between "cutting" and "demolition".
- G. Unless specifically indicated otherwise, existing Work cut, altered, or revised to accommodate new Work shall be patched to duplicate undisturbed adjacent finishes, colors, textures, and profiles. New Work in existing portions shall also be finished to match adjacent existing Work unless noted otherwise.
- H. Submit written request in advance of cutting or alteration which affects any of the following.
 - 1. Structural integrity of any element of Project
 - 2. Integrity of weather-exposed or moisture-resistant element
 - 3. Efficiency, maintenance or safety of any operational element
 - 4. Visual qualities of sight exposed elements
 - 5. Work of Owner or separate Contractor'
 - 6. Coordinated Drawings in accordance with Division 01, General Requirements (Section 01 30 00).
- I. Include in request:
 - 1. Identification of Project.
 - 2. Location and description of affected Work.
 - 3. Necessity for cutting or alteration.
 - 4. Description of proposed Work and products to be used.
 - 5. Alternatives to cutting and patching.
 - 6. Effect on Work of Owner or separate Contractor.
 - 7. Written permission of affected separate Contractor.
 - 8. Date and time Work will be executed.

1.8 QUALITY ASSURANCE-CLEANING

- A. Inspection: Conduct daily inspection, and more often if necessary, to verify that requirements of cleanliness are being met.
- B. Codes and Standards: In addition to requirements specified herein, comply with pertinent requirements of authorities having jurisdiction.
- C. For final cleaning, use only professional cleaning company experienced in commercial cleaning.

1.9 PAYMENT WITHHELD - CLEANING

- 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.

1.10 CLOSEOUT PROCEDURES

- A. Owner Occupancy:

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EXECUTION REQUIREMENTS**

1. Conform to Part 1, Title 24, Section 4-336 CCR Requirements for Verified Reports and Closeout Procedures.
 2. In conjunction with Project Inspector, Contractor shall prepare list of items (Punchlist) to be completed or corrected. List may be developed by areas when approved by Architect.
 3. Within time specified in the Certificate for Substantial completion after receipt of list, Architect will inspect to determine status of completion.
 4. Should Architect determine that Work is not complete:
 - a. Architect will promptly notify Contractor in writing, giving reasons for his determination.
 - b. Contractor shall remedy deficiencies and notify Architect when Work is ready for re-inspection.
 - c. Architect will re-inspect Work.
 5. When Architect concurs, that Work is substantially complete and ready for occupancy.
 - a. Owner will prepare the Notice of Completion accompanied by Contractor's list (Punchlist) of items to be completed or corrected as verified by Architect.
 - b. The Certified Notice of Completion will be submitted to the Owner and to Contractor for their written acceptance of responsibilities assigned to them in such notice.
 - c. Contractor shall provide consent by insurer for Partial or Beneficial Occupancy.
- B. Final Completion:
1. Prepare and submit notice that Work is ready for final inspection and acceptance.
 2. Verify Work is complete.
 3. Clarify that:
 - a. Work has been inspected by all governing agencies and is in compliance with Contract Documents.
 - b. Work has been completed in accordance with Contract Documents.
 - c. Equipment and systems have been tested as required and are operational.
 - d. Work is completed and ready for final inspection.
 4. Architect will make an inspection to verify status of completion.
 5. Should Architect determine Work is incomplete or defective:
 - a. Architect will promptly notify Contractor in writing, listing incomplete or defective Work.
 - b. Contractor shall remedy deficiencies promptly and notify Architect when ready for re-inspection.
 6. When Architect determines Work is acceptable under the Contract Documents, he will request Contractor to make closeout submittals.

- C. Closeout Submittals include, but are not necessarily limited to:
 - 1. Project Record Documents.
 - 2. Operation and maintenance data for items so listed in pertinent Sections of these Specifications and for other items when so approved by Architect.
 - 3. Warranties and Guarantees.
 - 4. Keys and keying schedule.
 - 5. Spare parts, materials, extra stock to be turned over to Owner.
 - 6. Evidence of payment and release of Stop Notices , when requested by Owner.
 - 7. List of subcontractors, service organizations and principal vendors, including names, addresses and telephone numbers, where they may be contacted for emergency service at all times, including nights, weekends and holidays.
 - 8. Notification of insurer for completion of Project.
- D. Final Payment:
 - 1. Submit Final Payment Request, showing all adjustments to Contract Sum.
 - 2. Retention will be released no sooner than 35 days after Notice of Completion has been recorded with County Recorder's Office.

1.11 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.12 PROJECT RECORD DOCUMENTS

- A. Record Documents: As-Built Drawings, Project Manual with Specifications including but not limited to the documents required herein.
- B. Owner will provide one set of drawings and one copy of Project Manual for use during construction to record changes made during construction.
- C. Record Documents: As-Built drawings and Project Manual, record in concise manner using industry-standard drafting techniques on drawings, on weekly basis all actual revisions to Work
 - 1. Changes made on Drawings, including Clarification Drawings.
 - 2. Changes made to Specifications.
 - 3. Changes made by Addenda.
 - 4. Changes made by Construction Change Directives/Instruction Bulletins, Architect's Supplemental Instructions, minor changes.
 - 5. Change Orders or other authorized Modifications to Contract.
 - 6. Revisions made to shop drawings, product data and samples.
- D. Store Record Documents separate from documents used for construction. Replace soiled or illegible documents.

- E. Record information concurrent with construction progress.
- F. Specifications: Legibly mark and record at each product Section description of actual products installed, including following:
 - 1. Manufacturer's name, trade name, product model and number and supplier.
 - 2. Authorized product substitutions or alternates utilized.
 - 3. Changes made by Addenda and Modifications.
- G. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements. Identify drains and sewers by invert elevation.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of Work. Identify ducts, dampers, valves, access doors and control equipment wiring.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original drawings.
- H. Obtain Architect's signed certification that Record Documents have been fully updated prior to submitting monthly payment requests. Compliance is mandatory before payment will be made.
- I. Submit Record Documents certified by Inspector to Architect with claim for final Application for Payment. Fully completed Record Documents are a prerequisite to final payment.
- J. RECORD DRAWINGS: In addition to the As-Built Drawings required by this Section, upon completion of Work, incorporate all changes from the As-Built Drawings to the Record Drawing set, submit in computer-generated electronic files, Version Auto CAD 2005 with all changes as noted on As-Built Drawings. Include all Change Orders, Addenda, field orders and as-installed conditions. Submit to Owner two (2) sets in CD Rom format containing all As-Built information. Contractor may request to use the Architect's computer-generated drawings in electronic format in accordance with Section 01 30 00 Administrative Requirements.

1.13 OPERATION AND MAINTENANCE DATA

- A. Submit six (6) sets prior to final inspection, bound in 8-1/2 by 11-inch text pages, in binders with durable covers. Include operation and maintenance data for all items for which submittals are requested in individual Sections of Specifications?

1.14 WARRANTY AND GUARANTEE

- A. Contractor, manufacturer's warranties and guarantees notwithstanding, warrants entire Work against defects in materials and workmanship for twelve (12) months from date of Certified Notice of Completion. Warranties and guarantees between Contractor and manufacturers and Contractor and suppliers shall not affect warranties or guarantees between Contractor and Owner. Refer to General Conditions for additional requirements.

- B. Execute and assemble documents from subcontractors, suppliers and manufacturers.
- C. Submit prior to final Application for Payment.
- D. For items of Work delayed beyond date of Notice of Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of Guarantee Period.

1.15 WARRANTIES - FORM OF SUBMITTALS

- A. Bind in commercial quality, 8-1/2 by 11 inch, three-ring side binders with hardback, cleanable, plastic covers.
- B. Label cover of each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible principal.
- C. Table of Contents: Neatly typed, in sequence of Table of Contents of Project Manual, with each item identified with number and title of Specification Section in which specified, and name of product or Work item.
- D. Separate each warranty or bond with index tab sheets keyed to Table of Contents listing. Provide full information, using separate typed sheets as necessary. List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

1.16 WARRANTIES - PREPARATION OF SUBMITTALS

- A. Obtain warranties and bonds, executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item or Work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until date of Certified Notice of Completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.

1.17 WARRANTIES - TIME OF SUBMITTALS

- A. For equipment or component parts of equipment put into service during construction with Owner's permission submit documents within ten days after acceptance.
- B. Make other submittals within ten days after date of Certified Notice of Completion, prior to final Application for Payment.
- C. For items of Work when acceptance is delayed beyond date of Notice of Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty period.

1.18 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance, and extra materials in quantities specified in individual Specification Sections.
- B. Deliver to project site location as directed by Owner.

1.19 INSTRUCTIONS TO OWNER'S PERSONNEL

- A. Instruct Owner's personnel in proper operation and maintenance of all systems, equipment and similar items which were provided as part of Work. Provide maintenance and inspection schedules that conform to manufacturer's recommendations.
- B. Contractor shall provide schedule to Owner for approval for each of instruction periods required.
- C. Instruction sessions will be held in Owner designated area on project site and at Owner's convenience.
- D. Prepare and submit to Architect a sign-in sheet with subject, date and time, signed by all participants for each session.
- E. Instructors shall be qualified by product manufacturer in subject matter presented at each session.

PART 2 - PRODUCTS

2.1 MATERIALS - CUTTING AND PATCHING

- A. Primary Products: Those required for original installation.

2.2 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product sections; match existing products and Work for patching and extending Work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing Work as standard.

2.3 CLEANING MATERIALS AND EQUIPMENT

- A. Provide required personnel, equipment and materials needed to maintain specified standard of cleanliness.

2.4 COMPATIBILITY

- A. Use cleaning materials and equipment that are compatible with surfaces being cleaned, as recommended by manufacturer of material to be cleaned.

PART 3 - EXECUTION

3.1 EXAMINATION - CUTTING AND PATCHING

- A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching. Confirm status and current warranties and guarantees.
- B. After uncovering existing Work, inspect conditions affecting performance of Work.
 - 1. Prior to cutting, boring or drilling through new or existing structural members or elements including reinforcing bars not specifically detailed, Contractor shall prepare detailed drawings for review and approval by Architect, Structural Engineer of Record and DSA Field Engineer. Approval by DSA is required prior to commencement of Work. Agency approvals will be obtained by Architect not Contractor.

- C. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION - CUTTING AND PATCHING

- A. Provide temporary support to ensure structural integrity of Work. Provide devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas that may be exposed by uncovering Work.
- C. Maintain excavations free of water.

3.3 CUTTING AND PATCHING

- A. Execute cutting, fitting, and patching to complete Work.
- B. Fit products together, to integrate with other Work.
- C. Uncover Work to install ill-timed Work.
- D. Remove and replace defective non-conforming Work.
- E. Provide openings in Work for penetration of mechanical and electrical Work.

3.4 PERFORMANCE - CUTTING AND PATCHING

- A. Execute Work by methods to avoid damage to other Work and which will provide appropriate surfaces to receive patching and finish.
- B. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval. Torches or other flame cutting equipment shall not be used to cut metal studs without prior approval of the Architect.
- C. Restore Work with new products in accordance with requirements of Contract Documents.
- D. Fit Work airtight to pipes, sleeves, ducts, conduits and other penetrations through surfaces.
- E. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- G. Extend patching to point where patching is not evident unless directed otherwise by Architect.

3.5 SLEEVES AND HANGERS

- A. Provide conduit, outlets, piping sleeves, boxes, inserts or other materials or equipment necessary to be built into Work. Promptly furnish same and set such sleeves or other materials as construction program required.
- B. In event delays occur in delivery of sleeves or other materials, arrange to have boxes or other forms set at locations where piping or other material is to pass through or into slabs or other Work.
- C. Upon subsequent installation of sleeves or other material, install fill materials as required. Necessary expenditures incurred for boxing out or filling shall be without extra cost to Owner.

3.6 PROGRESS CLEANING

A. General:

1. Retain stored items in orderly arrangement allowing maximum access, not impeding drainage or traffic and providing required protection of materials.
2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
3. At least twice each month, and more often if necessary, remove scrap, debris, and waste material from jobsite.
4. Provide adequate storage for items waiting removal from jobsite, observing requirements for fire protection and protection of ecology.

B. Site:

1. Daily, and more often if necessary, inspect site and pick up all scrap, debris, and waste material. Remove items to place designated for their storage.

Combustible waste shall be removed from site. Flammable waste shall be kept in sealed metal containers until removed from site.

2. Weekly, and more often if necessary, inspect, arrangements of materials stored on site, re-stack, tidy, or otherwise service arrangements to meet requirements specified above.
3. Maintain site in neat and orderly condition.

C. Structures:

1. Weekly, and more often if necessary, inspect structures and pick up scrap, debris, and waste material. Remove items to place designated for their storage.
2. Weekly, and more often if necessary, sweep interior spaces clean.
 - a. "Clean", for purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and handheld broom, i.e., "broom-clean".
3. As required preparatory to installation of succeeding materials, clean structures of pertinent portions thereof to degree of cleanliness recommended by manufacturer of succeeding material, using equipment and materials required to achieve required cleanliness.
4. Clean substrate; remove dirt, oil, grease, construction markings, and foreign matter that could adversely affect surface finish appearance or performance.
5. Following installation of finish floor materials, clean finish floor daily, and more often if necessary, and while Work is being performed in space in which finish materials have been installed.
 - a. "Clean", for purpose of this subparagraph, shall be interpreted as meaning free from foreign materials which, in opinion of Architect, may be injurious to finish floor material, i.e., "vacuum clean".

3.7 FINAL CLEANING

- A. Definition: Except as otherwise specifically provided, "clean", for purpose of Article, shall be interpreted as meaning level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials, i.e., "scrub and polish clean".
- B. General: Complete following cleaning operations before requesting inspection for certification of Notice of Completion.
 - 1. Prior to completion of Work, remove from jobsite all tools, surplus materials, equipment, scrap, debris, and waste, conduct final progress cleaning as described above.
 - 2. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - a. Unless otherwise specifically directed by Architect, water and broom clean paved areas on site and public paved areas directly adjacent to site. Remove resultant debris.
 - 3. Rake grounds that are neither planted nor paved to smooth, even-textured surface.
 - 4. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- C. Structures:
 - 1. Exterior: In areas affected by Work under this Contract, visually inspect exterior surfaces and remove traces of soils, waste material, smudges and other foreign matter. Remove traces of splashed material from adjacent surfaces. If necessary to achieve uniform degree of exterior cleanliness, hose down exterior of structure. In event of stubborn stains not removable with water, Architect may require light sandblasting or other cleaning at no additional cost to Owner.
 - 2. Interior: In areas affected by Work under this Contract, visually inspect interior surfaces and remove traces of soil waste material, smudges, and other foreign matter. Remove traces of splashed materials from adjacent surfaces. Remove paint drippings, spots, stains, and dirt from finished surfaces. Use only cleaning materials and equipment instructed by manufacturer of surface material.
 - 3. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - 4. Polished Surfaces: On surfaces requiring routine application of buffed polish, apply polish recommended by manufacturer of material being polished. Glossy surfaces shall be cleaned and shined as intended by manufacturer.

5. Carpet: Use only dry-chemical method of cleaning. Steam cleaning or water based cleaning shall not be used on carpet. Use only dry-chemical materials and methods fully approved by carpet manufacturer, as instructed in manufacturer's published literature.
 6. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- D. Mechanical and Electrical Systems
1. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 2. Replace parts subject to unusual operating conditions.
 3. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 4. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 5. Clean ducts, blowers, and coils if units were operated without filters during construction.
 6. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- E. Timing: Schedule final cleaning acceptable to the Architect to enable Owner to accept completely clean project.

3.8 CLEANING DURING OWNER'S OCCUPANCY

- A. Should Owner occupy Work or any portion thereof prior to its completion by Contractor and acceptance by Owner, responsibilities for interim and final cleaning of occupied spaces shall be determined by Architect in accordance with General Conditions of the Contract.

END OF SECTION

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements and limitations for cutting and patching of work.

1.2 SCOPE

- A. Where the work requires that a particular existing building element, such as a partition, wall, paving, window or similar element of existing building construction be removed, it is the intention of this specification that such work be a part of the demolition section and not a part of cutting and patching. Refer to individual category scope of work sheets to determine the limits of demolition work for each Prime Contractor.
- B. New work required to replace such removals is considered as a part of the separate sections of the specifications covering similar new construction.
- C. Where incidental cutting and patching is required for the installation of a specific item or piece of equipment (including piping, ductwork, conduit, etc.), all such cutting and patching is considered to be specified as a part of the section requiring the cutting and patching.
- D. Prime Contractor shall verify and check all areas to be cut and patched and shall coordinate the work of the various trades involved.
- E. Where doubt exists as to the size, location or method of cutting concrete, or any other structural element, Construction Manager shall contact the Architect before proceeding.
- F. Where doubt exists, Prime Contractor shall distinguish between "cutting and "demolition".
- G. Unless specifically designated otherwise, existing work cut, altered or revised to accommodate new work shall be patched to duplicate undisturbed adjacent finishes, colors, textures and profiles; new work in existing portions shall also be finished to match adjacent existing work unless noted otherwise.

1.3 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which affects:
 - 1. Structural integrity of any element of the Project.
 - 2. Integrity of weather-exposed or moisture-resistant element.
 - 3. Efficiency, maintenance or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Prime Contractor.
- B. Include in request:
 - 1. Identification of Project.
 - 2. Location and description of affected work.
 - 3. Necessity for cutting or alteration.
 - 4. Description of proposed work and products to be used.

5. Alternatives to cutting and patching.
6. Effect on work of Owner or Prime Contractor.
7. Written permission of affected Prime Contractor.
8. Date and time work will be executed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Primary Products: Those required for original installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. Confirm status and current warranties and guarantees.
- B. After uncovering existing work, inspect conditions affecting performance of work.
 1. Prior to cutting, boring or drilling through new or existing structural members or elements, including reinforcing bars, Prime Contractor shall prepare detailed drawings for review by the Architect and approval by the Structural Engineer and Architect, not Construction Manager or Prime Contractor.
- C. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Provide temporary support to ensure structural integrity of the work. Provide devices and methods to protect other portions of the Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work.
- C. Maintain excavations free of water.

3.3 CUTTING AND PATCHING

- A. Execute cutting, fitting, and patching to complete work.
- B. Fit products together to integrate with other work.
- C. Uncover work to install ill-timed work.
- D. Remove and replace defective or non-conforming work.
- E. Provide openings in the work for penetration of mechanical and electrical work.
- F. Sawcut existing pavement at nearest joint.

3.4 PERFORMANCE

- A. Execute work by methods to avoid damage to other work and which will provide appropriate surfaces to receive patching and finishing.
- B. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- C. Restore work with new products in accordance with requirements of Contract Documents.

- D. Fit work air tight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- E. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

3.5 SLEEVES AND HANGERS

- A. Provide conduit, outlets, piping sleeves, boxes, inserts or other materials or equipment necessary to be built into work. Promptly furnish same and set such sleeves or other materials as construction program required.
- B. In the event of delays in delivery of sleeves or other materials, arrange to have boxes or other forms set at locations where piping or other material is to pass through or into slabs or other work.
- C. Upon subsequent installation of sleeves or other material, install fill materials as required. Necessary expenditures incurred for boxing out or filling shall be without extra cost to the Owner.

END OF SECTION

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SECTION 01 74 00 - CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. The work includes the furnishing of all labor, materials, equipment, and services, and performing all operations necessary for, and properly incidental to, cleanup during construction and final cleaning of the building prior to acceptance by the Owner, including waxing and polishing as specified herein and in other sections when specified. The Conditions of the Contract and the other sections of Division 1 apply to this section as fully as if repeated herein.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 CLEANUP DURING CONSTRUCTION

- A. It is required that the entire site be kept in a neat and orderly condition, and the Architect may, at any time during construction, order a general cleanup of the site as a part of the work under this section.
- B. Dispose of waste, trash, and debris in a safe, acceptable manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction. Bury no such waste material and debris on the site. Burning of trash and debris on the site will not be permitted.
- C. Location of dump for trash and debris and length of haul is the Contractor's responsibility.

3.2 FINAL CLEANING OF BUILDING

N/A Prior to final inspection by the Architect and after all construction work is essentially \

3.3 FINAL SITE CLEANUP

- A. Also prior to final inspection, thoroughly clean the entire site and put it into a neat, acceptable condition. Remove from the entire site all construction waste and unused materials, dunnage, loose rock and stones, excess earth, roots, weeds, and all debris of any description resulting from the work. Hose down and scrub where necessary all new concrete and asphalt pavement and walks dirtied as a result of the work. Thoroughly remove mortar droppings from concrete walks and other pavements.

END OF SECTION

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SECTION 01 77 00 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

The work includes performing all operations necessary for and properly incidental to closing out the project and assisting in Owner's final inspection as hereinafter specified. The Conditions of the Contract and the other sections of Division 1 apply to this section as fully as if repeated herein.

1.2 REQUIREMENTS PREPARATORY TO FINAL INSPECTION

- A. All temporary facilities shall be removed from the site as specified in Section 01 50 00.
- B. The building and site shall be thoroughly cleaned as specified in Section 01 74 00.
- C. All plumbing and mechanical equipment shall be operated quietly and free from vibration. Properly adjust, repair, balance, ore replace equipment producing objectionable noise or vibration in the occupied areas of the building. Provide additional brackets, bracing, or other methods to prevent objectionable noise or vibration. All systems shall operate without humming, surging, or rapid cycling.
- D. All operating instructions for equipment shall be properly mounted and posted as specified in their respective sections.
- E. Record (As-built) drawings shall be completed, signed, and submitted to the Architect as specified under Article 1.4 of this section.
- F. The Material and Equipment maintenance instructions, as specified in the body of the Specifications, shall be submitted to the Architect.
- G. All guarantees and warranties shall be submitted to the Architect as specified in the General Conditions.

1.3 FINAL INSPECTION

- A. After all requirements preparatory to the final inspection have been completed as herein before specified, Contractor shall notify the Architect and the Inspector of Record to perform the final inspection. Notice shall be given at least three (3) working days in advance of the time the final inspection is to be performed.
- B. The Contractor or his principal superintendent, authorized to act in behalf of the Contractor, shall accompany the Architect and Owner on the final inspection tour, as well as principal subcontractors that the Architect or Owner may request to be present.
- C. If the work has been completed in accordance with the Contract Documents and no further corrective measures are required, the Owner will accept the Project and will file for the Notice of Completion.
- D. If the work has been substantially completed in accordance with the Contract Documents, and only minor corrective measures are required, the Architect will prepare a punch list of work to be corrected and the Owner will conditionally accept the Project and will file for the Notice of Completion based upon the Contractor's assurance that the corrective measures will be completed within the shortest practicable time period.

- E. If the work has not been substantially completed in accordance with the Contract Documents, and several corrective measures are still required, the Owner will not accept the Project or file for the Notice of Completion. Instead, a punch list will be prepared, based on the information gathered from the final inspection, and the Contractor will be required to complete this work and then call for another final inspection, following the procedure outlined above.
- F. Upon acceptance of the Project by the Owner, Contractor shall submit his request for the final and acceptance payment. Final payment will not be made by the Owner, however, until thirty-five (35) days after filing for the Notice of Completion.

1.4 RECORD DRAWINGS (AS-BUILT DRAWINGS)

- A. The Contractor shall provide digital .pdf Record Drawings (use Contract Documents) which shall clearly show all differences between the contract work as drawn and as installed for all concealed work, as well as work added to the contract which is not shown on the Contract Drawings.
- B. Concealed shall mean work installed underground or in an area which cannot be readily inspected by use of access panels, inspection plates or other removable features.
- C. The Contractor shall maintain a set of Record Drawings at the job site. These shall be kept current and legible and shall be available for inspection at all times by the Architect, DSA Inspector, Owner's Inspector of Record. Show all changes in the contract work or work added on the Record Drawings in a contrasting color.
- D. At the conclusion of work, the Contractor shall provide at his cost one set of non-reproducible prints of record drawings and clarification drawings to Owner.
- E. In showing changes in the work, or added work, use the same legends that are used on the Contract Drawings. Indicate exact locations by dimensions and exact elevations. Give dimensions from a permanent reference point. Prepare all changes to scale.

1.5 OPERATION AND MAINTENANCE DATA SUBMITTAL

- A. The Contractor shall submit to the Owner for approval, five (5) copies of complete operation and maintenance data as specified herein and in other sections of these specifications. Data shall be submitted a minimum of thirty (30) days prior to completion of the contract. The contract shall not be considered complete until this data has been reviewed by the Owner.
- B. Assemble all data required herein, except that to be mounted in frames, in three-ring loose-leaf binders, complete with index, index dividers, and permanently attached exterior label on cover.
- C. Data Required:
 - 1. Manufacturer's Manuals: Complete installation, operation, maintenance and service manuals, and printed instructions and parts lists for all materials and equipment where such printed matter is regularly available from the manufacturer. This includes but is not limited to such service manuals as may be sold by the manufacturer covering the operation and maintenance of his items, and complete replacement parts lists sufficiently detailed for parts replacement ordering to manufacturer. Bound publications need not be assembled in binders.
 - 2. Equipment Nameplate Data: A typewritten list of all mechanical and electrical equipment showing all equipment nameplate data exactly. Identify equipment by means of names, symbols, and numbers used in the contract documents.

3. System Operating Instructions: Typewritten instructions covering operation of the entire system as installed (not duplicating manufacturer's instructions for operating individual components). Include schematic flow and control diagrams as appropriate and show or list system valves, control elements, and equipment components using identification symbols and numbers. List rooms, area of equipment served, and show proper settings for valves, controls, and switches.
4. System Maintenance Instructions: Typewritten instructions covering routine maintenance of system. List each item of equipment requiring inspection, lubrication, or service and briefly describe such maintenance, including types of lubricants and frequency of service. It is not intended that these instructions duplicate manufacturer's detailed instructions. Give name, address and phone number of nearest firm authorized or qualified to service equipment or provide parts.
5. Wall-Mounted Data: Frame one set of typewritten system instructions and diagrams as required under Paragraphs .3 and .4 above covered with glass and mounted in locations as directed by the Owner. This set of instructions is in addition to the five required hereinbefore.

1.6 INSTRUCTION OF OWNER'S MAINTENANCE PERSONNEL BY THE CONTRACTOR

- A. After work under this contract is completed, tested and prior to acceptance, and not less than five (5) days after submittal of the operation and maintenance data required in Paragraph 2.6, the Contractor shall operate all systems for a period of three 8-hour days during which time he shall keep on the project a competent person or persons familiar with the items installed whose full-time assignment will be to instruct the Owner's maintenance personnel in the operating and maintenance of the equipment and systems.
- B. Any instructions from manufacturer's representatives required under other sections of this specification shall be conducted during this period. This instruction period shall not be conducted prior to completion of all piping and equipment labeling required by the contract.
 1. All arrangements and notices for operation and instruction periods shall be made through the Owner.
 2. This three-day instruction period shall be in addition and subsequent to any period of operation, test and adjustment called for elsewhere in this specification.

1.7 MANUFACTURERS' WARRANTIES

- A. Deliver all the manufacturers' warranties required by the Contract Documents, with Owner named as the beneficiary. In addition, for all equipment and machinery, or components thereof, bearing a manufacturers' warranty that extends for a longer time period than the Contractor's warranty, secure and deliver the manufacturers' warranties in the same manner.
- B. Form of Warranty: Written warranties, except manufacturers' standard printed warranties, shall be on the Contractor's, subcontractor's, material supplier's, or manufacturer's own letterhead, addressed to the Owner. All warranties shall be submitted in duplicate, and in the form shown on the following page, modified as approved to suite the conditions pertaining to the warranty.
- C. Submission of Warranties: Collect and assemble all written warranties into a bound booklet form and deliver them to the Owner's Counsel for final review and approval.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01 78 00 – CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.2 RELATED REQUIREMENTS

- A. Section District issued Bidding Instructions and General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 40 00 – Quality Requirements: Code Required Special Inspections & Procedures: Construction oversight procedures by DSA regarding the execution, approval, and closeout of this building project.
- D. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.
- E. Individual Product Sections: Specific requirements for operation and maintenance data.
- F. Individual Product Sections: Warranties required for specific products or Work.
 - 1. Special Project warranty requirements for specific products or elements of the Work; commitments and agreements for continuing services to District.

1.3 DEFINITIONS

- A. Warranty: Assurance to District by Contractor, installer, supplier, manufacturer or other party responsible as warrantor, for the quantity, quality, performance and other representations of a product, system service of the Work, in whole or in part, for the duration of the specified period of time.
- B. Guarantee: Assurance to District by Contractor or product manufacturer or other specified party, as guarantor, that the specified warranty will be fulfilled by the guarantor in the event of default by the warrantor.
- C. Standard Product Warranty: Preprinted, written warranty published by product manufacturer for particular products and specifically endorsed by the manufacturer to the District.
- D. Special Project Warranty: Written warranty required by or incorporated into Contract Documents, to extend time limits provided by standard warranty or to provide greater rights for District.

- E. Correction Period: As defined in the Conditions of the Contract, Correction Period shall be synonymous with "warranty period", "guarantee period" and similar terms used in the Contract Specifications.

1.4 SUBMITTALS

- A. Advance Submittals: For equipment and systems, or component parts of systems, put into service during construction and operated by District, submit documents within ten days of start of operation by District.
- B. Final Completion Submittals: Prior to application for final payment, Contractor shall submit 3 copies the following:
1. Agency Document Submittals: Submit to District all documents required by authorities having jurisdiction, including serving utilities and other agencies. Submit original versions of all permit cards, with final sign-off by inspectors. Submit all certifications of inspections and tests.
 - a. Contractor shall also complete all required contractor forms and obtain DSA approval of these same forms. Comply with "Final Certification of Construction" per Title 24 Part 1 section 4-339.
 - 1) Form-6.C: Verified Report – Contractor: From each Contractor having a contract with the District.
 2. Final Specifications Submittals: Submit to District all documents and products required by Specifications to be submitted, including the following:
 - a. Project record drawings and specifications.
 - b. Operating and maintenance data.
 - c. Guarantees, warranties and bonds.
 - d. Spare parts and extra stock.
 - e. Test reports and certificates of compliance.
 3. Certificates of Compliance and Test Report Submittals: Submit to District certificates and reports as specified and as required by authorities having jurisdiction, including the following:
 - a. Sterilization of water systems.
 - b. Gas system tests.
 - c. Lighting, power and signal system tests.
 - d. Ventilation equipment and air balance tests.
 - e. Roofing inspections and tests.
 4. Lien and Bonding Company Releases: Submit to District, with copy to Architect, evidence of satisfaction of encumbrances on Project by completion and submission of The American Institute of Architects Forms:
 - a. G706 - Contractor's Affidavit of Payment of Debts and Claims;
 - b. G706A - Contractor's Affidavit of Release of Liens;
 - c. (if applicable) G707 - Consent of Surety;
 - d. or forms as agreed to by the District.

- e. Comply also with other requirements of District, as directed.
 - f. All signatures shall be notarized.
- 5. Subcontractor List: Submit two copies to District and two copies to Architect of updated Subcontractor and Materials Supplier List.
- 6. Warranty Documents: Prepare and submit to District all warranties and bonds as specified in Contract General Conditions and this Section.
- C. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- D. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by District, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- E. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with District's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

1.5 WARRANTIES AND GUARANTEES

- A. General:
 - 1. Provide all warranties and guarantees with District named as beneficiary.
 - 2. For equipment and products, or components thereof, bearing a manufacturer's warranty or guarantee that extends for a period of time beyond the Contractor's warranty and guarantee, so state in the warranty or guarantee.

- B. Provisions for Special Warranties: Refer to Conditions of the Contract for terms of the Contractor's special warranty of workmanship and materials.
- C. General Warranty and Guarantee Requirements:
 - 1. Warranty shall be an agreement to repair or replace, without cost and undue hardship to District, Work performed under the Contract which is found to be defective during the Correction Period (warranty or guarantee) period.
 - 2. Repairs and replacements due to improper maintenance or operation, or due to normal wear, usage and weathering are excluded from warranty requirements unless otherwise specified.
- D. Specific Warranty and Guarantee Requirements: Specific requirements are included in product Specifications Sections of Divisions 3 through 32, including content and limitations.
- E. Disclaimers and Limitations:
 - 1. Manufacturer's disclaimers and limitations on product warranties and guarantees shall not relieve Contractor of responsibility for warranty and guarantee requirements.
 - 2. This applies to the Work that incorporates such products, nor shall they relieve suppliers, manufacturers, and installers required to countersign special warranties with Contractor.
- F. Related Damages and Losses: When correcting warranted Work that has been found defective, remove and replace other Work that has been damaged as a result of such defect or that must be removed and replaced to provide access for correction of warranted Work.
- G. Reinstatement of Warranty:
 - 1. When Work covered by a warranty has been found defective and has been corrected by replacement or rebuilding, reinstate the warranty by written endorsement.
 - 2. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- H. Replacement Cost:
 - 1. Upon determination that Work covered by a warranty has been found to be defective, replace or reconstruct the Work to a condition acceptable to District, complying with applicable requirements of the Contract Documents.
 - 2. Contractor shall be responsible for all costs for replacing or reconstructing defective Work regardless of whether District has benefited from use of the Work through a portion of its anticipated useful service life.

I. District's Recourse:

1. Written warranties made to the District shall be in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under law, nor shall warranty periods be interpreted as limitations on time in which the District can enforce such other duties, obligations, rights, or remedies.
2. Rejection of Warranties:
 - a. The District reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

J. Warranty as Condition of Acceptance:

1. District reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment shall be required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 PROJECT RECORD DOCUMENTS

- A. Record Documents are to be maintained and submitted in searchable live electronic format (PDF).
 1. Develop in compliance with Section 01 30 00 - Administrative Requirements.
 2. Acceptable markup software:
 - a. Adobe Acrobat Professional.
 - b. Bluebeam Revu.
- B. Maintain on site one set of the following record documents; record actual revisions to the Work:
 1. Contract Drawings.
 2. Project Manual with Specifications.
 3. Addenda.
 4. Change Orders and other modifications to the Contract.
 5. Reviewed shop drawings, product data, and samples.
 6. Manufacturer's instruction for assembly, installation, and adjusting.
- C. Ensure entries are complete and accurate, enabling future reference by District.

- D. Store record documents separate from documents used for construction.
- E. Record information concurrent with construction progress.
- F. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
 - 4. Provide copies of all approved addenda, directives, corrections, and change orders affecting the associated project.
 - a. These copies shall be included with the "Bid Set" and/or "Record Set" listed above and formatted as detailed above.
- G. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Reproducible set of Contract Drawings will be provided to Contractor by District through Architect or Construction Manager.
 - 2. Measured depths of foundations in relation to finish first floor datum.
 - 3. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 4. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 5. Field changes of dimension and detail.
 - 6. Details not on original Contract drawings.
 - a. Application of copies of details produced and provided by Architect during construction will be accepted.
- H. Submission: Submit Record Documents in searchable (live text and redlines mark-ups; not scanned) PDF format to Architect prior to final Application for Payment.
 - 1. Maintain one additional paper copy and one in PDF format (on CD) of the fire suppression and fire protection detection system drawings and specifications at the building premises.
 - a. One copy is to be kept on site for a period of three years to comply with CFC section 901.6.2.

3.2 OPERATION AND MAINTENANCE DATA

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.3 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
 - 2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.4 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.

- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
 - 1. Parts Data:
 - a. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams as necessary for service and maintenance.
 - b. Include complete nomenclature and catalog numbers for consumable and replacement parts.
 - c. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in stock by the District or operator.
- O. Include test and balancing reports.
- P. Additional Requirements: As specified in individual product specification sections.

3.5 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for District's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
 - 1. Provide duplicate electronic formatted (PDF) versions of the O&M binder for record purposes. Organize the same as the printed versions.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
- F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- J. Arrangement of Contents: Organize each volume in parts as follows:
 - 1. Project Directory.
 - 2. Table of Contents, of all volumes, and of this volume.
 - 3. Operation and Maintenance Data: Arranged by system, then by product category.
 - a. Source data.
 - b. Product data, shop drawings, and other submittals.
 - c. Operation and maintenance data.
 - d. Field quality control data.
 - e. Photocopies of warranties and bonds.

4. Design Data: To allow for addition of design data furnished by Architect or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

3.6 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with District's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Project Warranty and Guarantee Forms:
 1. Example forms for special Project warranties and guarantees are included at the end of this Section.
 2. Prepare written documents utilizing the appropriate form, ready for execution by the Contractor, or the Contractor and subcontractor, supplier or manufacturer.
 - a. Submit a draft to District through Architect for approval prior to final execution.
 3. Refer to product Specifications Sections of Divisions 2 through 33 for specific content requirements, and particular requirements for submittal of special warranties.
 4. Prepare standard warranties and guarantees, excepting manufacturers' standard printed warranties and guarantees, on Contractor's, subcontractor's, material supplier's, or manufacturer's own letterhead, addressed to District.
 5. Warranty and guarantee letters shall be signed by all responsible parties and by Contractor in every case, with modifications only as approved in advance by District to suit the conditions pertaining to the warranty or guarantee.
- C. Manufacturer's Guarantee Form:
 1. Manufacturer's guarantee form may be used in lieu of special Project form included at the end of this Section.
 2. Manufacturer's guarantee form shall contain appropriate terms and identification, ready for execution by the required parties.
 3. If proposed terms and conditions restrict guarantee coverage or require actions by District beyond those specified, submit draft of guarantee to District through Architect for review and acceptance before performance of the Work.
 4. In other cases, submit draft of guarantee to District through Architect for approval prior to final execution of guarantee.
- D. Signatures: Signatures shall be by person authorized to sign warranties, guarantees and bonds on behalf of entity providing such warranty, guarantee or bond.

- E. Co-Signature: All installer's warranties and bonds shall be co-signed by Contractor. Manufacturer's guarantees will not require co-signature.
- F. Verify that documents are in proper form, contain full information, and are notarized.
- G. Co-execute submittals when required.
- H. Retain warranties and bonds until time specified for submittal.
- I. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- J. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
 - 1. If more than one volume of warranties, guarantees and bonds is produced, identify volume number on binder.
- K. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- L. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- M. Form of Warranty and Bond Submittals:
 - 1. Prior to final Application and Certificate for Payment, compile two copies of each required warranty, guarantee and bond, properly executed by Contractor, or jointly by Contractor, subcontractor, supplier, or manufacturer.
 - 2. Collect and assemble all written warranties and guarantees into binders and deliver binders to District for final review and acceptance.
 - 3. Include Table of Contents for binder, neatly typed, following order and Section numbers and titles as used in the Project Manual.
 - 4. Provide heavy paper dividers with celluloid or plastic covered tabs for each separate warranty.
 - a. Mark tabs to identify products or installation, and Section number and title.
 - 5. Include on separate typed sheet, if information is not contained in warranty or guarantee form, a description of the product or installation, and the name, address, telephone number and responsible person for applicable installer, supplier and manufacturer.
 - 6. When operating and maintenance data manuals are required for warranted construction, include additional copies of each required warranty and guarantee in each required manual.

- a. Coordinate with requirements listed in the prior articles for operating and maintenance data manuals.

3.7 TIME OF WARRANTY AND BOND SUBMITTALS

A. Submission of Preliminary Copies:

1. Unless otherwise specified, obtain preliminary copies of warranties, guarantees and bonds within ten days of completion of applicable item or Work.
2. Prepare and submit preliminary copies for review as specified herein.

B. Submission of Final Copies:

1. Submit fully executed copies of warranties, guarantees and bonds within ten days of date identified in Certificate of Completion but no later than three days prior to date of final Application for Payment.

C. Date of Warranties and Bonds:

1. Unless otherwise directed or specified, commencement date of warranty, guarantee and bond periods shall be the date established in the Certificate of Completion.
2. Warranties for Work accepted in advance of date stated in Certificate of Completion:
 - a. When a designated system, equipment, component parts or other portion of the Work is completed and occupied or put to beneficial use by District:
 - 1) By separate agreement with Contractor, prior to completion date established in the Certificate of Completion, submit properly executed warranties to District within ten days of completion of that designated portion of the Work.
 - 2) List date of commencement of warranty, guarantee or bond period as the date established in the Certificate of Completion.
3. Warranties for Work not accepted as of date established in the Certificate of Completion:
 - a. Submit documents within ten days after acceptance, listing date of acceptance as beginning of warranty, guarantee or bond period.

D. Duration of Warranties and Guarantees:

1. Unless otherwise specified or prescribed by law, warranty and guarantee periods shall be not less than the Correction Period required by the Conditions of the Contract.
2. In no case, the period is to be less than one year from the date established for completion of the Project in the Certificate of Completion.

3. See product Specifications Sections of the Project Manual for extended warranty and guarantee beyond the minimum one year duration.

END OF SECTION

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SECTION 01 78 29 - CONFORMANCE SURVEY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Conformance surveying required for proper completion of the work including, but not necessarily limited to, the following:
 - 1. Synthetic turf construction, including subgrade and base preparation.
 - 2. Other applicable Project components.
- B. Related Requirements:
 - 1. See Division 31
 - 2. Section 32 11 23 – Aggregate Base Course
 - 3. Section 32 18 13 – Synthetic Turf Playing Field

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Submittal Procedures: Action and Informational Submittals shall be submitted in accordance with Section 01 33 00 - Submittal Procedures.

1.3 ACTION SUBMITTALS

- A. Conformance Survey: In addition to required prints, submit 1 electronic copy in AutoCAD or scaled PDF image of all conformance surveys for the Project. Review response by the Owner Representative shall identify any areas out of tolerance.

1.4 INFORMATIONAL SUBMITTALS

- A. Name and address of Contractor's licensed surveyor to the Owner's Representative.

1.5 QUALITY CONTROL AND REWORK

- A. Contractor shall retain a California Licensed Land Surveyor to obtain survey data and supervise preparation of the Conformance Surveys as specified.
- B. Portions of a survey that does not conform to the grading tolerance requirements identified in this Section will be corrected by the Contractor at its expense. Areas out of conformance shall be resurveyed at the Contractor's expense by its Surveyor. Revised points shall be added to the original digital file for resubmittal, review, and acceptance by the Owner Representative.
- C. Delays and costs incurred due to grades out of conformance are the sole responsibility of the Contractor. At any time during construction and following acceptance of a portion of the survey by the Owner, the Owner reserves the right to recheck the surface grades at its expense to verify it is still in conformance.
- D. It is the Contractor's responsibility to protect the grading and compaction tolerances of surveyed surfaces after Conformance Surveying operations are complete and accepted, and prior to installation of subsequent materials.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 LAYING OUT THE WORK

- A. Prior to beginning work, Contractor shall secure the electronic grading plan from the Owner for use by the Surveyor.
- B. The Contractor's Surveyor shall provide all conformance survey drawings. The drawings shall provide both the design elevations and the as-constructed spot elevations. These elevations shall be for comparison to those on the Contract Documents for the same location. Contractor shall also show the difference in these two numbers. Unique reference numbers shall be assigned to each point for reference purposes. For spacing requirements, refer to specific type of improvement identified in this Section.
- C. Accuracy of the Contractor's surveys provided under this Section shall be to 0.01 feet.
- D. The Contractor's Licensed Surveyor shall provide all conformance survey drawings and all 25- foot grid or other grid conformance grades based on the designed grades shown on the Drawings.
- E. Post-Sod Installation:
 - 1. Upon acceptance of the pre-turf installation conformance survey, Contractor shall install the specified turf material.
 - 2. If directed by the Owner, the Contractor shall survey the turf prior to final acceptance as outlined above to ensure the turf areas are in compliance with the Contract and specified tolerances.

END OF SECTION

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Record Drawings.
- B. Record Specifications.
- C. Record Product Data.
- D. Record Samples.
- E. Record Photos.
- F. Miscellaneous record submittals.

1.2 SUBMITTALS

- A. See Section 01 33 00 – Submittal Procedures
- B. Project Record Documents: Recorded actual locations.

PART 2 -PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 RECORD DRAWINGS

- A. Record Documents: Maintain one set of marked-up PDF copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Field changes of dimensions from Drawings.
 - b. Revisions to details shown on Drawings.
 - 1) Details not on original Contract Drawings. Application of copies of details produced and provided by Architect during construction will be accepted.
 - c. Depths of foundations and footing, measured in relation to finish First Floor datum.
 - d. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent ground improvements.
 - e. Revisions to routing of piping and conduits.

- f. Revisions to electrical circuits.
 - g. Actual equipment locations and sizes.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Permanent Room names and Room numbers.
 - k. Changes made by Change Order or Construction Change Directive.
 - l. Changes made following written orders by District or Construction Manager.
 - m. Changes made following Architect's written orders.
 - n. Note clarifications from RFI's.
 - o. Field records for variable and concealed conditions.
 - p. Record information on the Work that is shown only schematically.
- 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
- 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
- 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
 - 1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 - a. Format: DWG, Version, Microsoft Windows operating system.
 - 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 - 3. Refer instances of uncertainty to Architect and Construction Manager for resolution.
 - 4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
 - 1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 - 2. Consult Architect and Construction Manager for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file with comment function enabled.

3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification:
 - a. Project name and number.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect and Construction Manager.
 - e. Name of Contractor.

3.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications in PART 2 to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and Record Drawings, where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file.

3.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file.
 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

3.4 RECORD SAMPLES

- A. Immediately before date of Substantial Completion, meet with District or Construction Manager at Project site to determine which Samples maintained during the construction period are to be transmitted to District or Construction Manager for record purposes.
- B. Comply with District or Construction Manager's instructions for packaging, identification, marking, and delivery to District or Construction Manager's Sample storage space. Dispose of other Samples in the manner specified for disposing surplus and waste materials

3.5 RECORD PHOTOS

- A. Photograph all work before covering up, including:
 - 1. All open trenches and manholes shall be photographed.
 - 2. All exposed utilities should be identified in the photos.
 - 3. Show photograph locations and dates on Record Drawings.

3.6 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
 - 1. Field records on excavations and foundations.
 - 2. Field records on underground construction and similar work.
 - 3. Surveys showing locations and elevations of underground lines.
 - 4. Invert elevations of drainage piping.
 - 5. Surveys establishing building lines and levels.
 - 6. Authorized measurements using unit prices or allowances.
 - 7. Records of plant treatment.
 - 8. Ambient and substrate condition tests.
 - 9. Certifications received in lieu of labels on bulk products.
 - 10. Batch mixing and bulk delivery records.
 - 11. Testing and qualification of trade persons.
 - 12. Documented qualification of installation firms.
 - 13. Load and performance testing.
 - 14. Inspections and certifications by governing authorities.
 - 15. Leakage and water-penetration tests.
 - 16. Fire-resistance and flame-spread test results.
 - 17. Final inspection and correction procedures.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

3.7 SUBMISSION

- A. Keep Project Record Documents current, as they will be reviewed for completeness by Architect, Engineer, Project Inspector, and Construction Manager; as a condition of certification for each Progress Payment Application.
- B. Prior to the date of the Notice of Completion, submit marked Record Documents to Architect and Construction Manager for review, approval and further processing.

3.8 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Review of documents by Architect, Engineer, Project Inspector, or Construction Manager to be in concert with approval of the monthly Application for Payment.

- C. Maintenance of Record Documents and Samples:
1. Store record documents and Samples in the field office apart from the Contract Documents used for construction.
 2. Do not use project record documents for construction purposes.
 3. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss.
 4. Provide access to project record documents for Architect and Construction Manager reference during normal working hours.

END OF SECTION

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SECTION 02 41 00 – DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Selective demolition of built site elements.
 - 1. Demolition and removal of existing site improvements within Project area, as indicated on Drawings and as necessary to accomplish the Work, including:
 - a. Asphaltic concrete and portland cement concrete paving.
 - b. Abandoned underground utility lines outside of utility easement.
 - c. Pavement cutting and removal.
 - d. Debris removal.
 - 2. Handling and disposal of removed materials.
 - 3. Dewatering of excavations as necessary to control surface and sub-surface water.
- B. Selective demolition of building elements for alteration purposes.
- C. Abandonment and removal of existing utilities and utility structures.

1.2 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary of Work: Limitations on Contractor's use of site and premises.
- B. Section 01 74 00 – Cleaning and Waste Management.
- C. Section 31 10 00 - Site Clearing: Vegetation and existing debris removal.
- D. Section 31 23 23 - Fill: Filling holes, pits, and excavations generated as a result of removal operations.

1.3 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards.
- B. CFC Ch. 33 - Fire Safety During Construction and Demolition.
- C. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.4 DEFINITIONS

- A. Remove: Remove and legally dispose of items, except those identified for use in recycling, re- use, and salvage programs.
- B. Environmental Pollution and Damage: The presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human or animal life; affect other species of importance to humanity; or degrade the utility of the environment for aesthetic, cultural or historical purposes.

- C. Inert Fill: A permitted facility that accepts inert waste such as asphalt and concrete exclusively for the purpose of disposal.
 - 1. Inert Solids/Inert Waste: Non-liquid solid waste including, but not limited to, soil and concrete, that does not contain hazardous substances or soluble pollutants at concentrations in excess of water-quality standards established by a regional water board and does not contain significant quantities of decomposable solid waste.
- D. Class III Landfill: A landfill that accepts non-hazardous materials such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from the State of California.
- E. Demolition Waste: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The materials may include rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- F. Chemical Waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals and inorganic wastes.
- G. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- H. Reuse: The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- I. Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Construction Conference: Conduct a pre-construction conference one week prior to the start of the work of this section; require attendance by all affected trades.
- B. Convene a conference at the Project site 3 days prior to starting demolition to review the Drawings and Specifications, requirements of authorities having jurisdiction, instructions and requirements of serving utilities, sequencing and interface considerations and project conditions.
- C. Conference shall be attended by DSA, supervisory and quality control personnel of Contractor and all subcontractors performing this and directly-related Work.
- D. Submit minutes of meeting to District, Project Inspector and Architect, for Project record purposes.
- E. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1. Refer to sequence requirements specified in Section 01 10 00 - Summary; and construction progress schedule requirements specified in Section 01 30 00 - Administrative Requirements.

1.6 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain property of Riverside County Office Education, demolished materials shall become the Contractor's property and shall be removed, recycled, or disposed from Project site in an appropriate and legal manner.
 1. Arrange a meeting no less than ten (10) days prior to demolition with the District or DSA and other designated representatives to review any salvagable items to determine if District wants to retain ownership, and discuss Contractor's Waste Management and Recycling Plan.

1.7 SUBMITTALS

- A. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.
 1. Record drawings: Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.8 SCHEDULING

- A. Schedule Work to precede new construction.
- B. Describe demolition removal procedures and schedule.
- C. Perform work between the hours of 8am and 5pm, subject to noise abatement regulations and District's approval for noise considerations.

PART 2 - PRODUCTS -- NOT USED

PART 3 - EXECUTION

3.1 SCOPE

- A. Remove paving and curbs as required to accomplish new work.
- B. Remove other items indicated, for salvage, relocation, and recycling.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Conform to the relevant Article of the General Conditions, local Air Quality Management District and other applicable regulatory procedures when discovering hazardous or contaminated materials.
- B. Selective Demolition of Site and Building Elements:
 1. Use techniques acceptable to authorities having jurisdiction and which will achieve intended results and provide protection of surrounding features to remain.
 2. Some items may have been demolished prior to Work of this Contract. Verify existing conditions prior to start of demolition. If items are or have been demolished contact the Architect.

3. Some items may require postponement of demolition until late in Contract Time period.
 4. Phase demolition as necessary to provide adequate interfacing of related Work.
 5. Demolish in an orderly and careful manner. Protect existing foundations, retaining walls, utility structures, other structures and finish materials to remain.
- C. Field Measurements and Conditions:
1. Survey existing conditions and correlate with requirements indicated to determine extent of demolition and recycling required.
 2. In addition to provisions of the Conditions of the Contract, verify dimensions and field conditions prior to construction. Verify condition of substrate and adjoining Work before proceeding with demolition Work. If conflict is found notify DSA, Project Inspector and Architect.
- D. Comply with governing EPA notification regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Obtain and pay for all permits required.
- E. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
1. Obtain required permits.
 2. Comply with applicable requirements of NFPA 241 and CFC Ch. 33.
 3. Use of explosives is not permitted.
 4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 6. Do not close or obstruct roadways or sidewalks without permit.
 7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- F. Do not begin removal until receipt of notification to proceed from District.
- G. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
 2. Prevent movement or settlement of adjacent structures.
 3. Stop work immediately if adjacent structures appear to be in danger.
 4. Protect existing landscaping materials, appurtenances, structures and items that are

not to be demolished, or are on adjacent property.

- 5. Mark location of utilities.
- H. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- I. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.
- J. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect in accordance with requirements of Section 01 60 00 - Product Requirements.
- K. Damages: Promptly repair damages to adjacent facilities caused by demolition operations.
- L. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.3 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to District.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to District.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.4 DEWATERING

- A. Dewatering: Dewater site in localized areas as Work progresses.
 - 1. Provide an adequate system to lower and control groundwater in order to permit excavation, construction of structures, and placement of fill materials under dry conditions.
 - 2. Install sufficient dewatering equipment to pre-drain waterbearing strata above and below bottom of structure foundations, drains, sewers, and other excavations.
 - 3. Maintain excavations free of standing water.
 - 4. Provide dewatering 24 hours per day in advance of placement of concrete.
 - 5. Allow no concrete to be placed in standing water.
 - 6. Ensure that trenching and excavations do not cave in due to water.
- B. Surface Run-off Water Control:
 - 1. Minimize flow of ground water from adjacent areas into Work areas.

2. Do not restrict flow from adjacent properties such that natural flow is hindered.
- C. Water Disposal:
 1. Dispose of run-off by legal means and as acceptable to authorities having jurisdiction.
 2. Dispose of water removed from excavations in a manner to avoid endangering public health, property, and portions of Work under construction or completed.
 3. Dispose of water in a manner to avoid inconvenience to others engaged in work about site.
 4. Provide sumps, sedimentation tanks, and other flow control devices as required by authorities having jurisdiction.

3.5 PORTLAND CEMENT CONCRETE AND ASPHALTIC CONCRETE PAVING DEMOLITION

- A. Cutting: Make a saw cut at edges of existing paving to be removed, where portions of existing paving are indicated to remain.
- B. Cutting Method: When adjacent to new paving, cut with abrasive type, water-cooled saw to a minimum depth of 1-1/2 inches. Cut lines straight and square to face of paving.
- C. Aggregate Base: Existing aggregate base may be retained except where landscaping and overexcavation are indicated.
- D. Concrete Removal: Break concrete and remove debris. Preserve straight cut.
- E. Disposal: Remove debris from the site except where allowed or directed for fill for subsequent earthwork or for landscape walls.

3.6 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 1. Verify that construction and utility arrangements are as indicated.
 2. Report discrepancies to Architect before disturbing existing installation.
 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Protect existing work to remain.
 1. Prevent movement of structure; provide shoring and bracing if necessary.
 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
 4. Patch as specified for patching new work.

3.7 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 00 – Cleaning and Waste Management.
- C. Leave site in clean condition, ready for subsequent work.

- D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

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SECTION 03 10 00 – CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Formwork for cast-in-place concrete as indicated.
 - 2. Installation of items to be embedded in concrete, such as anchor bolts, inserts, embeds, and sleeves.
- B. Related Requirements:
 - 1. Division 01 - General Requirements.
 - 2. Section 03 20 00 - Concrete Reinforcing.

1.2 REFERENCES

- A. American Concrete Institute (ACI) Publication:
 - 1. ACI 318 – Building Code Requirements for Structural Concrete, Chapter 26, Section 26.11 - Formwork.
 - 2. ACI 347 – Guide to Formwork for Concrete.
- B. American Plywood Association (APA):
 - 1. Form No. V345 - Concrete Forming Design/Construction Guide.
- C. National Institute of Standards and Technology (NIST):
 - 1. NIST Voluntary Product Standard PS 1.

1.3 SUBMITTALS

- A. Submit detailed structural calculations and drawings approved and signed by a California registered Civil Engineer where the height of the falsework or vertical shoring, as measured from the top of the sills to the soffit of the superstructure exceeds 14 feet, or where individual horizontal span lengths exceed 16 feet, or where provision for vehicular traffic through falsework or shoring occurs. For all other falsework and shoring submit layout signed by California registered Civil Engineer, manufacturer's authorized representative or a licensed contractor experienced in the usage and erection of falsework and vertical shoring. A copy of the plans and calculation shall be available at the jobsite at all times.
- B. Shop Drawings: Submit Shop Drawings indicating locations of forms, construction and expansion joints, embedded items, and accessories.
- C. Product Data: Submit manufacturer's Product Data for form materials and accessories.

1.4 REGULATORY REQUIREMENTS

- A. California Building Code (CBC-SS/CC), Chapter 19A.
- B. California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 4, Construction Safety Orders, Article 6, Excavations, Sections 1713 and 1717.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Storage shall prevent damage and permit access to materials for inspection and identification.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Form materials may be reused during progress of the Work provided they are completely cleaned and reconditioned, recoated for each use, capable of producing formwork of required quality, and are structurally sound.
- B. Form Lumber: WCLIB Construction Grade or Better, WWPA No. 1 or Better.
- C. Plywood: NIST Voluntary Product Standard PS 1, Group 1, Exterior Grade B-B Plyform or better, minimum 5-ply and 3/4 inch thick for exposed locations and at least 5/8 inch thick for unexposed locations, grade marked, not mill oiled. Furnished plywood with medium or high density overlay is permitted.
- D. Coated Form Plywood: For exposed painted concrete, plastic overlaid plywood of grade specified above, factory coated with a form coating and release agent Nox-crete", or equal.
- E. Tube Forms: Sonoco "Seamless Sonotubes," Ceme-Tube, Quik-Tube, or equal, of the type leaving no marks in concrete, one-piece lengths for required heights.
- F. Joist Forms: Code recognized steel or molded plastic types as required.
- G. Special Forms: For exposed integrally-colored concrete, plywood as above with high density overlay, plywood with integral structural hardboard facing or fibrous glass reinforced plastic facing, providing specified finish.
- H. For Exposed Concrete Finish:
 - 1. Plywood: New, waterproof, synthetic resin bonded, exterior type Douglas fir or Southern pine plywood manufactured especially for concrete formwork and conforming to NIST Voluntary Product Standard PS 1, Grade B-B grade, Class I.
 - 2. Glass-Fiber-Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to structural tolerances and appearance of finished concrete surfaces.
 - 3. Steel: Minimum 16 gage sheet, well matched, tight fitting, stiffened to support weight of concrete, without deflection detrimental to tolerances and appearances of finished concrete surfaces.
 - 4. Plywood: "Finland Form,," "Combi Form" by North American Plywood Corporation, "Plyform" by Roy O. Martin, "ProForm" by Pacific Wood Laminates, or equal. The material shall be furnished with hard smooth birch face veneers with phenolic resin thermally fused onto panel sides. Edges shall be factory sealed.

- I. Form Ties: Prefabricated rod, flat band, wire, internally threaded disconnecting type, not leaving metal within 1 1/2-inch of concrete surface.
- J. Form Coating: Non-staining clear coating free from oil, silicone, wax, not grain-raising, "Formshield" by A.C. Horn, Inc., "Release" by Edoco/Dayton Superior, "Cast-Off" by Sonneborn/BASF Building Systems or equal. Where form liners are furnished, provide form coatings recommended by form liner manufacturer.
- K. Form Liner: Rigid or resilient type by L.M. Scofield, Symons, Greenstreak, or equal.
- L. Void Forms: Manufactured by SureVoid Products, Inc., Sonotube, Void Form International, or equal. Forms shall be "WallVoid" for temporary support of concrete walls and grade beams spanning between supports, and "SlabVoid" for creating gaps between concrete slabs or steps and underlying soils. Void forms shall be fabricated of corrugated paper with moisture resistant exterior, and shall be capable of withstanding working load of 1,500 psf. Provide accessories as required.

PART 3 - EXECUTION

3.1 GENERAL

- A. Forms shall be constructed so as to shape final concrete structure conforming to shape, lines and dimensions of members required by Drawings and Specifications, and shall be sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together to maintain position and shape. Forms and their supports shall be designed so that previously placed structures will not be damaged.
- B. Use form coating at all surfaces in contact with concrete.

3.2 TOLERANCES

- A. Permitted abrupt or gradual irregularities in formed surfaces as measured within a 5 feet length with a straightedge shall per ACI 347, Table 3.1:

Class of Surface			
A	B	C	D
1/8 inch	1/4 inch	1/2 inch	1 inch

- 1. Class A: Use for concrete surfaces prominently exposed to public view.
- 2. Class B: Use for coarse-textured concrete-formed surfaces intended to receive plaster, stucco or wainscoting.
- 3. Class C: Use as a general standard for permanently exposed surfaces where other finishes are not specified.
- 4. Class D: Use for surfaces where roughness is not objectionable and will be permanently concealed.

3.3 ERECTION

- A. Plywood shall be installed with horizontal joints level, vertical joints plumb and with joints tight.

Back joints by studs or solid blocking, and fill where necessary for smoothness. Reused plywood shall be thoroughly cleaned, damaged edges or surfaces repaired and both sides and edges oiled with colorless form oil. Nail plywood along edges, and to intermediate supports, with common wire nails spaced as necessary to maintain alignment and prevent warping.

- B. Openings for Cleaning: Provide temporary openings at points in formwork to facilitate cleaning and inspection. At base of walls and wide piers, bottom form board on one face for entire length shall be omitted until form has been cleaned and inspected.
- C. Chamfers: Provide 3/4 inch by 3/4 inch chamfer strips for all exposed concrete corners and edges unless otherwise indicated.

3.4 REMOVAL OF FORMS

- A. Forms shall not be removed until concrete has sufficiently hydrated to maintain its integrity and not be damaged by form removal operations. Unless noted otherwise and/or permitted by the Architect, columns and wall forms shall not be removed in less than five days, floor slabs in less than seven days, beams and girders in less than 15 days, pan forms for joists may be removed after three days, but joist centering shall not be removed until after 15 days, and ramp, landing, steps and floor slabs shall not be removed in less than seven days. Shoring shall not be removed until member has acquired sufficient strength to support its weight, load upon it, and added load of construction.
- B. Compressive strength of in-place concrete shall be determined by testing field-cured specimens representative of concrete location or members, as specified in Section 32 13 13: Concrete Paving.

3.5 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.6 CLEAN UP

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

END OF SECTION

SECTION 03 20 00 – CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Concrete steel reinforcement.
- B. Related Requirements:
 - 1. Division 01 - General Requirements.
 - 2. Section 01 45 16, Field Quality Control Procedures
 - 3. Section 03 10 00, Concrete Forming.
 - 4. Section 32 13 13, Concrete Paving.

1.2 REGULATORY REQUIREMENTS

- A. Fabrication and placement of reinforcing shall be in accordance with requirements of CBC-SS, Chapter 19A.

1.3 REFERENCES:

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - 2. ASTM A706 - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
 - 3. ASTM A1064 – Standard Specification for Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- B. American Concrete Institute (ACI) Publication:
 - 1. ACI SP-66 – ACI Detailing Manual.
 - 2. ACI 318 – Building Code Requirements for Structural Concrete, as modified by CBC Sections 1903A and 1905A.
- C. American Welding Society (AWS):
 - 1. AWS D1.4 – Structural Welding Code – Reinforcing Steel.

1.4 SUBMITTALS

- A. Shop Drawings: Submit steel reinforcement Shop Drawings in accordance with ACI 315. Include assembly diagrams, bending charts and slab plans. Indicate lengths and location of splices, size and lengths of reinforcing steel.
- B. Closeout Submittals: Record exact locations of reinforcing that vary from Shop Drawings.

1.5 QUALITY ASSURANCE

- A. Comply with the following as a minimum requirement:

1. Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice.
 2. American Welding Society (AWS).
 3. American Concrete Institute (ACI).
 4. CBC-SS, Chapter 19A, Concrete.
- B. Source Quality Control: Refer to Division 01 Sections for general requirements and to the following paragraphs for specific procedures. Testing laboratory retained by the Owner shall select test Samples of bars, ties, and stirrups from the material at the Project Site or from the place of distribution, with each Sample consisting of not less than two 18 inch long pieces, and perform the following tests according to ASTM A615, or ASTM A706, as applicable:
1. Identified Bars: If Samples are obtained from bundles as delivered from the mill, identified as to heat number, accompanied by mill analyses and mill test reports, and properly tagged with the identification certificate so as to be readily identified, perform one tensile and one bend test for each 10 tons or fraction thereof of each size of bars. Submit mill reports when Samples are selected.
 2. Unidentified Bars: When positive identification of reinforcing bars cannot be performed and when random Samples are obtained; perform tests for each 2.5 tons or fraction thereof, one tensile and one bend test from each size of bars.
- C. Certification of Welders: Shop and Project site welding shall be performed by welding operators certified by AWS.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Avoid exposure to dirt, moisture or conditions harmful to reinforcing.
- B. Reinforcing steel bars, wire, and wire fabric shall be stored on the Project site to permit easy access for examination and identification of each shipment. Material of each shipment shall be separated for size and shape.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide reinforcing of sizes, gages and lengths indicated, bent to indicated shapes.

2.2 MATERIALS

- A. Steel Reinforcing Bars: ASTM A615, or ASTM A706 deformed grade 60 billet steel unless otherwise specified or indicated.
- B. Tie Wire: ASTM A1064, fully annealed, copper-bearing steel wire, 16 gage minimum.
- C. Chairs, Spacers, Supports, and Other Accessories: Standard manufacture conforming to ACI 315 fabricated from steel wire of required types and sizes. For reinforcement supported from grade, provide properly sized dense precast blocks of concrete.

2.3 FABRICATION OF REINFORCING BARS:

- A. Comply with CRSI Manual of Standard Practice for Reinforced Concrete Construction for fabrication of reinforcing steel.

- B. Bending and Forming: Fabricate bars of the indicated sizes and bend and form to required shapes and lengths by methods not injurious to materials. Do not heat reinforcement for bending. Bend bars No. 6 size and larger in the shop only. Bars with unscheduled kinks or bends are not permitted. Provide only tested and permitted bar materials.
- C. Welding: Provide only ASTM A706 steel where welding is indicated. Perform welding by the direct electric arc process in accordance with AWS D1.4 and specified low-hydrogen electrodes. Preheat 6 inches each side of joint. Protect joints from drafts during the cooling process; accelerated cooling is not permitted. Do not tack weld bars. Clean metal surfaces to be welded of loose scale and foreign material. Clean welds each time electrode is changed and chip burned edges before placing welds. When wire brushed, the completed welds must exhibit uniform section, smooth welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion and penetration into the base metal. Cut out welds or parts of welds deemed defective, using chisel, and replace with proper welding. Prequalification of welds shall be in accordance with CBC-SS requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Bars shall be bent cold. Bars partially embedded in concrete shall not be field bent except as indicated on reviewed Shop Drawings.
- B. Before installation and just prior to placing concrete, clean reinforcing of loose scale, rust, oil, dirt and any coating that could reduce bond.
- C. Accurately position, install, and secure reinforcing to prevent displacement during the placement of concrete.
- D. Provide metal chairs to hold reinforcement the required distance above form bottoms. In beams and slab construction, provide chairs under top slab reinforcement as well as under bottom reinforcement. Space chairs so that reinforcement will not be displaced during installation. Provide metal spacers to secure proper spacing. Stirrups shall be accurately and securely wired to bars at both top and bottom. At slabs, footings, and beams in contact with earth, provide concrete blocks to support reinforcement at required distance above grade.
- E. Install and secure reinforcement to maintain required clearance between parallel bars and between bars and forms. Lapped splices shall be installed wherever possible in a manner to provide required clearance between sets of bars. Stagger lapped splices. Dowels and bars extending through construction joints shall be secured in position against displacement before concrete is installed and subsequently cleaned of concrete encrustations while they are still soft.
- F. Do not install reinforcing in supported slabs and beams until walls and columns have been installed to underside of slabs and beams or until construction joints have been thoroughly cleaned. Reinforcing shall be inspected before placement of concrete and cleaned as required.
- G. Use deformed bars unless otherwise indicated, except for spiral reinforcement.

3.2 CLEAN UP

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

3.3 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cast-in-place normal weight and lightweight concrete, placement and finishing.
- B. Related Requirements:
 - 1. Division 01 - General Requirements.
 - 2. Section 32 13 13, Concrete Paving.
 - 3. Section 03 10 00, Concrete Forming and Accessories.
 - 4. Section 03 20 00, Concrete Reinforcing.

1.2 REFERENCES

- A. American Concrete Institute (ACI) Publication:
 - 1. ACI 117 – Specifications for Tolerances for Concrete Construction and Materials.
 - 2. ACI 301 – Specifications for Structural Concrete.
 - 3. ACI 302.1R – Guide for Concrete Floor and Slab Construction.
 - 4. ACI 305R - Specification for Hot Weather Concreting.
 - 4. ACI 306.1 – Standard Specification for Cold Weather Concreting.
 - 5. ACI 318 - Building Code Requirements for Structural Concrete, as modified by CBC-SS Sections 1903A and 1905A.
- B. American Society for Testing and Materials (ASTM) Standards:
 - 1. ASTM C31 – Standard Specification for Making and Curing Concrete Test Specimens in the Field.
 - 2. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 3. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 4. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
 - 5. ASTM C88 - Standard Test Method for Soundness of Aggregates by use of Sodium Sulphate or Magnesium Sulphate.

6. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
7. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
8. ASTM C150 - Standard Specification for Portland Cement.
9. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
10. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
11. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
13. ASTM C289 - Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
14. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
15. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
16. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
17. ASTM C567 - Standard Test Method for Determining Density of Structural Lightweight Concrete.
18. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
19. ASTM C845 - Standard Specification for Expansive Hydraulic Cement
20. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
21. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
22. ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
23. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures
24. ASTM C1567 - Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method).

25. ASTM D1751 - Standard Test Method for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
26. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
27. ASTM E1155 - Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers.
28. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
29. ASTM E1745 - Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.3 SUBMITTALS

- A. Shop Drawings: Submit Shop Drawings indicating locations of cast-in-place concrete Work and accessory items such as vapor barriers. Include details and locations of reinforcing, embedded items, and interfacing with other Work.
- B. Mix Design Data: Submit concrete mix designs as specified herein and in Article 2.02.
 1. Submit name, address and telephone number of the concrete production facility which the contractor intends to engage to design the concrete mixes. Submit name and qualifications of the proposed concrete technologist.
 2. Mix Design: Submit a concrete mix design for each strength and type of concrete indicated in the drawings or specified. Include water/cement ratio, source, size and amount of coarse aggregate and admixtures. Predict minimum compressive strength, maximum slump and air content percentage. Clearly indicate locations where each mix design will be used.
 3. Test Reports: Submit copies of test reports showing that the proposed mixes produce concrete with the strengths and properties specified. Include tests for cement, aggregates and admixtures. Provide gradation analysis.
- C. Material Samples: Submit Samples illustrating concrete finishes and hardeners, minimum 12-inch by 12-inch.
- D. Certificates: Submit certification that each of the following conforms to the standards indicated:
 1. Portland cement: ASTM C150.
 2. Normal weight concrete aggregates: ASTM C33.
 3. Lightweight concrete aggregates: ASTM C330.

- 4. Aggregates: Submit evidence that the aggregate is not reactive in the presence of cement alkalis. In the absence of evidence, aggregate shall be tested per ASTM C289. If results of test are other than innocuous, aggregates shall be tested per ASTM C1567 as reported per ACI 318 as modified by CBC-SS, Section 1903A.5.
- 5. Curing materials: ASTM C171.
- E. Admixtures: Submit product data for proposed concrete admixtures.

1.4 QUALITY ASSURANCE

- A. Continuous inspection shall be provided at the batch plant and for transit-mixed concrete to run check sieve analysis of aggregate, check moisture content of fine aggregate, check design of mix, check cement being used with test reports, check loading of mixer trucks, and certify to quantities of materials placed in each mixer truck.
- B. Inspection shall be performed by a representative of a testing laboratory selected by the Owner. Owner will pay for inspection costs. Notify the laboratory 24 hours in advance of time concrete is to be mixed. Notify the laboratory of postponement or cancellation of mixing within at least 24 hours of scheduling time.
- C. Contractor shall assist the testing laboratory in obtaining and handling samples at the project site and at the source of materials.
- D. Continuous batch plant inspection requirement may be waived in accordance with CBC-SS Section 1704A.3.3.1. Waiver shall be in writing, including DSA approval. When batch plant inspection is waived by DSA, the following requirements shall be met:
 - 1. Approved inspector of the testing laboratory shall check the first batching at the start of work and furnish mix proportions to the licensed weightmaster.
 - 2. Licensed weightmaster shall positively identify materials as to quantity and certify to each load by a ticket.
 - 3. Tickets shall be transmitted to the Inspector by a truck driver with load identified thereon. The Inspector will not accept the load without a load ticket identifying the mix and will keep a daily record of placements, identifying each truck, its load and time of receipt and approximate location of deposit in the structure and will transmit a copy of the daily record to DSA.
 - 4. At the end of the project, the weightmaster shall furnish an affidavit to DSA certifying that all concrete furnished conforms in every particular to proportions established by mix designs.
- E. Special Inspections and Tests shall be in accordance with CBC-SS Chapter 17A, Reinforcement and Anchor testing per CBC-SS Section 1916A and Specification Section 01 45 33.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store cement and aggregate materials so as to prevent their deterioration or intrusion by foreign matter. Deteriorated or contaminated materials shall not be furnished.

- B. Packaged materials shall bear the manufacturers and brand name label, and shall be stored in their original unbroken package in a weather tight place until ready for use in the work.

1.6 PROJECT CONDITIONS

- A. Cold Weather Requirements: Batching, mixing, delivering and placing of concrete in cold weather shall comply with the applicable requirements of ACI 306.1.
- B. Hot Weather Requirements: Batching, mixing, delivering and placing of concrete in hot weather shall comply with the applicable requirements of ACI 305R.
- C. Concrete temperature of freshly mixed concrete shall be determined per ASTM C1064.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cement: ASTM C150. Portland Cement.
- B. Aggregates: Conform to the following standards:
 - 1. Normal weight concrete: ASTM C33.
 - 2. Lightweight concrete: ASTM C330, with fine aggregates per ASTM C33.
 - 3. Aggregate shall be tested for Potential Alkali Reactivity of Cement-Aggregate Combinations per ASTM C289.
 - 4. Nominal maximum size of coarse aggregate shall be no larger than:
 - a. 1/5 the narrowest dimension between sides of forms, nor
 - b. 1/3 the depth of slabs, nor
 - c. 3/4 the clear spacing between individual reinforcing bars or wires, bundles of bars, individual tendons, or ducts.
 - d. Contractor may request the Architect and DSA waiver of the above limitations reported per ACI 318 as modified per CBC-SS Section 1903A.5, provided that the workability and methods of consolidation are such that the concrete can be placed without honeycombs or voids.
- C. Water: Comply to ASTM C1602 (per ACI 318-19). Water for concrete mixes, curing and cleaning shall be potable and free from deleterious matter.
- D. Admixtures: Shall be shown capable of maintaining essentially the same composition and performance throughout the work as the product used in establishing concrete proportions in accordance with ACI 318, Section 26.4.1.5.
 - 1. Admixtures containing chlorides or sulfides are not permitted.
 - 2. Air-entraining admixtures shall comply with ASTM C260. Air-entrained admixtures shall not be used for floor slabs to receive steel trowel finish.

3. Admixtures for water reduction and setting time modification shall conform to ASTM C494.
4. Admixtures for producing flowing concrete shall conform to ASTM C1017.
5. Fly ash, pozzolan and ground granulated blast-furnace slag: Modify ACI 318 Section 26.4.2.2 as follows:
 - a. Fly ash or other pozzolan used as a partial substitution for ASTM C150 Portland cement shall meet the following requirements:
 - 1) Shall conform to ASTM C618 for Class N or F materials
6. Admixtures containing ASTM C845 expansive cements shall be compatible with the cement and produce no deleterious effects.
7. Silica fumes used as an admixture shall conform to ASTM C1240.

2.2 CONCRETE MIX

- A. Mix shall be signed and sealed by a Civil or Structural Engineer currently registered in the State of California.
- B. The required strength and durability of concrete shall be determined by compliance with the proportioning, testing, mixing and placing provisions of CBC-SS Section 1904A.1. Concrete mix shall meet the durability requirements of ACI 318, Section 19.3.
- C. Concrete proportioning shall be in accordance with ACI 318, Section 26.4.3. Proportions of materials shall provide workability and consistency to permit concrete to be placed readily into forms and around reinforcement under conditions of placement to be employed, without segregation or excessive bleeding.
- D. Ready-Mixed Concrete: Mix and deliver in accordance with requirements of ASTM C94.
- E. Provide concrete to the following criteria:

	Min. 28-day	Max.	Max. Size
Element	Strength psi	Slump	Aggregate
Grade Beams and Foundation	4,500	4 inch	1" Normal wt. concrete
Other	3,000	4 inch	¾" Normal wt. concrete

PART 3 - EXECUTION

3.1 GENERAL

- A. Surfaces to receive concrete shall be free of debris, standing water, and any other deleterious substances before start of concrete placing.
- B. Time of Placing: Do not place concrete until reinforcement, conduits, outlet boxes, anchors, hangers, sleeves, bolts, and other embedded materials are securely fastened in place. Contact the Inspector at least 24 hours before placing concrete; do not place concrete until inspected by the IOR.

- C. Pouring Record: A record shall be kept on the Project site of time and date of placing concrete in each portion of structure. Such record shall be maintained on the Project site until Substantial Completion and shall be available for examination by the Architect and DSA.

3.2 TOLERANCES

- A. Concrete construction tolerances shall be as specified in ACI 117 and as modified herein.
- B. Refer to ACI 302.1R, Tables 8.1 and 8.2 Slab on Ground and Suspended Flatness/Levelness Construction Guide, for recommended concrete placing and finishing methods.
- C. Floor Flatness and Floor Levelness shall be tested in accordance to ASTM E1155. Floor measurements shall be made within 48 hours after slab installation and shall precede removal of shores and forms.

3.3 PREPARATION

- A. Vapor Barrier: Before installation of screeds and slab reinforcement, install vapor barrier under slabs on grade, as indicated in the drawings.
 - 1. Install in accordance to ASTM E1643.
 - 2. Place vapor retarder sheeting with the longest dimension parallel with the direction of the concrete pour.
 - 3. Laps or seams shall be overlapped 6 inches, or as recommended by manufacturer. Laps and penetrations shall be sealed with the manufacturer's recommended tape and/or mastic.
 - 4. Inspector will inspect and mark areas of damage and insufficient installation of the vapor barrier sufficiently in advance of concrete placement.
 - a) Deficiencies shall be corrected before concrete is placed.
 - b) Patch damaged areas with vapor barrier overlapping four sides 6 inches and adhering with tape.
- B. Reglets and Rebates:
 - 1. Form reglets and rebates in concrete to receive flashing, frames and other equipment as detailed and required. Coordinate dimensions and locations required with other related Work.
 - 2. If concrete slabs on grade adjoin a wall or other perpendicular concrete surface, form a reglet in wall to receive and carry horizontal concrete Work. Reglet shall be full thickness of the slab and shall be 3/4 inch wide, unless otherwise indicated. Requirement does not apply to exterior walks, unless specifically indicated.
- C. Anchor Slots: Embedded anchor slots in concrete walls to receive masonry veneer shall be set vertically in forms, 24 inches maximum on centers measured horizontally. Anchor slots shall be No. 24 gage galvanized sheet steel with removable fiber filler to prevent seepage of cement in slot.

- D. Screeds: Install screeds accurately and maintain at required grade or slab elevations after steel reinforcement has been installed, but before starting to place concrete. Install screeds adjacent to walls and in parallel rows not to exceed 8 feet on centers.

3.4 INSTALLATION

A. Conveying and Placing:

1. Concrete shall be placed only under direct observation of the PI. Do not place concrete outside of regular working hours, unless the Inspector has been notified at least 48 hours in advance.
2. Concrete shall be conveyed from mixer to location of final placement by methods that will prevent separation or loss of materials.
3. Concrete shall be placed as nearly as practicable to its final position to avoid segregation due to re-handling or flowing. No concrete that has partially hydrated or has been contaminated by foreign materials shall be placed, nor shall re-tempered concrete or concrete which has been remixed after initial set be placed.
4. In placing concrete in columns, walls or thin sections, provide openings in forms, elephant trunks, tremies or other recognized devices, to prevent segregation and accumulation of partially hydrated concrete on forms or metal reinforcement above level of concrete being placed. Such devices shall be installed so that concrete will be dropped vertically. Unconfined vertical drop of concrete from end of such devices to final placement surface shall not exceed 6 feet.
5. Concrete shall be placed as a continuous operation until placing of panel or section is completed. Top surfaces of vertically formed lifts shall be level.
6. Concrete shall be thoroughly consolidated by suitable means during placement, and shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
7. Where conditions make consolidation difficult or where reinforcement is congested, batches of mortar containing same proportions of cement, sand, and water as provided in the concrete, shall first be deposited in the forms to a depth of at least one inch.

B. Cold Weather:

1. Provide adequate equipment for heating concrete materials and protecting concrete during freezing or near-freezing weather. All ground with which concrete is to come in contact shall be free from frost. No frozen materials or materials containing ice shall be used.
2. The temperature of concrete at the time of placement shall not be below the minimum temperatures given in Table 3.1 of ACI 306.1.

3. Concrete shall be maintained at a temperature of at least 50° F. for not less than 72 hours after placing or until it has thoroughly hardened. Cover concrete and provide sufficient heat as required. When necessary, aggregates shall be heated before mixing. Special precautions shall be taken for protection of transit-mixed concrete.
- C. Hot Weather:
1. Concrete to be placed during hot weather shall comply with the requirements of ACI 318, Section 5.13.
 2. Maintain concrete temperatures indicated in Table 2.1.5 of ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square feet of exposed concrete per hour.
 3. Cool concrete using methods indicated in ACI 305R Appendix B.
 4. Place and cure concrete as specified in ACI 305R Chapter 4.
- D. Compaction and Screeding:
1. Tamp freshly placed concrete with a heavy tamper until at least 3/8 inch of mortar is brought to surface. Concrete shall then be tamped with a light tamper and screeded with a heavy straightedge until depressions and irregularities are eliminated, and surface is true to finish grades or elevations. Remove excess water and debris.
- F. Curing:
1. Length of time, temperature and moisture conditions for curing concrete shall be in accordance with ACI 318, Section 26.5.3.
 2. Forms containing concrete, top of concrete between forms, and exposed concrete surfaces after removal of forms shall be maintained in a thoroughly wet condition for at least 7 consecutive days after placing.

3.5 FINISHING

- A. Soda and Acid Wash: Concrete surfaces to receive plaster, paint or other finish, and which have been formed by oil coated forms, shall be scrubbed with a solution of 1-1/2 pounds of caustic soda to one gallon of water. Surfaces where smooth wood or waste molds have been furnished shall be scrubbed with a solution of 20 percent muriatic acid. Wash with clean water after scrubbing.
- B. Sacking: Exposed concrete curbs, walls, and other surfaces shall be sacked by an application of Portland cement grout, floated, and rubbed. Sacking shall not be performed until patching and filling of holes has been completed. Entire sacking operation for any continuous area shall be started and completed within the same day.
1. Mix one part Portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having consistency of thick paint. Wet surface of concrete sufficiently to prevent absorption of water from grout. Apply grout uniformly with a brush or spray gun, then immediately float surface with a cork or other suitable float, scouring wall vigorously.

2. While grout is still plastic, finish surface with a sponge-rubber float, removing excess grout. Allow surface to dry thoroughly, then rub vigorously with dry burlap to completely remove dried grout. No visible film or grout shall remain after rubbing with burlap.
- C. Sandblasting: Exterior concrete surfaces to receive stucco dash coat finish, where plywood or other smooth forms have been furnished, shall be uniformly sand-blasted with sharp quartz sand under sufficient air pressure to remove dirt, form oil and other foreign materials, and roughen surface to provide a proper bond. Such surfaces shall be thoroughly washed with clean water after sandblasting.
- D. Abrasive: Concrete stair treads, landings, ramps and steps on interior and exterior of buildings, and interior exposed concrete floors in shop buildings shall receive an abrasive finish.
- E. Cement Grout and Dry-Pack Concrete: Cement grout shall be mixed at the Project site and shall be composed of one volume of Portland cement and 2-1/2 volumes of fine aggregate. Materials shall be mixed dry with sufficient water added to make mixture flow under its own weight. When grout is used as a dry pack concrete, add sufficient water to provide a stiff mixture, which can be molded into a sphere.

3.7 TESTING

- A. Molded Cylinder Tests:
 1. Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards (345 m³) of concrete, or not less than once for each 2,000 square feet (186 m²) of surface area for slabs or walls. Additional samples for 7-day compressive strength tests shall be taken for each class of concrete at the beginning of the concrete work or whenever the mix or aggregate is changed.
 2. Inspector or testing lab personnel will prepare cylinders and perform slump tests. Samples for concrete strength shall be taken in accordance to ASTM C172. Each cylinder shall be dated, given a number, point in structure from which sample was obtained, mix design number, mix design strength and result of accompanying slump test noted.
 3. Separate tests of molded concrete cylinders obtained at same place and time shall be made at age of three days, seven days, and 28 days. A strength test shall be the average of the compressive strength of two cylinders, obtained from the same sample of concrete and tested at 28 days or at test age designated for determination of f'_c.
 4. Test cylinders shall be prepared at the Project site and stored in testing laboratory in accordance with ASTM C31, and tested in accordance with ASTM C39.
- B. Core Test: At request of the Architect, cores of hardened concrete shall be cut from portions of hydrated structures for testing, in accordance with CBC-SS and ASTM C42.
 1. Provide 4 inch diameter cores at representative places throughout the structure as designated by the Architect.

2. In general, provide sufficient cores to represent concrete placed with at least one core for each 4,000 square feet of building area, and at least 3 cores total for each Project.
 3. Where cores have been removed, fill voids with drypack, and patch the finish to match the adjacent existing surfaces.
- C. Concrete Consistency: Measure consistency according to ASTM C143. Test twice each day or partial day's run of the mixer.
- D. Adjustment of Mix: If the strength of any grade of concrete for any portion of Work, as indicated by molded test cylinders, falls below minimum 28 days compressive strength specified or indicated, adjust mix design for remaining portion of construction so that resulting concrete meets minimum strength requirements.
- E. Air Content Testing: Measure in accordance to ASTM C173 or ASTM C231, for each composite sample taken in accordance to ASTM C172.
- F. Defective Concrete:
1. Should strength of any grade of concrete, for any portion of Work indicated by tests of molded cylinders and core tests, fall below minimum 28 days strength specified or indicated, concrete will be deemed defective Work and shall be replaced or adequately strengthened in a manner acceptable to the Architect and DSA.
 2. Concrete Work that is not formed as indicated, is not true within 1/250 of span, not true to intended alignment, not plumb or level where so intended, not true to intended grades and levels, contains sawdust shavings, wood or embedded debris, or does not fully conform to Contract provisions, shall be deemed to be defective Work and shall be removed and replaced.
- G. Concrete for Equipment Pads, Mechanical and Electrical Work: Unless otherwise indicated, strength shall have a minimum $f'c = 3,000$ psi. Exposed concrete shall be provided with a hand trowel finish with radius corners and edges. Form and place concrete where necessary as described in Section 03 10 00 Concrete Forming and Accessories, and reinforced as described in Section 03 20 00 Concrete Reinforcing. Calcium chloride shall not be furnished in any concrete mix provided for the installation of underground electrical conduits. For concrete encasement of more than one conduit, furnish 3/4 inch maximum aggregate.

3.8 CLEAN UP

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

3.9 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

END OF SECTION

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SECTION 05 40 00 - COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Load-bearing cold-formed structural steel studs.
- B. Interior wall framing using Cold Formed Metal Framing at plumbing walls, wall openings and cabinet-supporting walls [and at lead-lined gypsum board framing].
- C. Formed steel accessories.
- D. Related Sections
 - 1. Section 07 21 00, Insulation.
 - 2. Section 07 92 00, Joint Sealers.
 - 3. Section 09 22 16, Non-Structural Metal Studs.
 - 4. Section 09 29 00, Gypsum Board.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. AISI - American Iron and Steel Institute
 - 1. S100 - North American Specification for the Design of Cold-Formed Steel Structural Members.
 - 2. S200 - Cold-Formed Steel Framing.
 - 3. S211-Wall-Stud Design
 - 4. S212 - Header Design
 - 5. S213 - Lateral Design
- C. ASTM International
 - 1. A 1003 - Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members
 - 2. A653/A653M - Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy - Coated (Galvannealed) by the Hot-Dip Process.
 - 3. C955 - Cold-Formed Steel Structural Framing Members.
 - 4. C1007 - Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
 - 5. C 1513 - Steel Tapping Screws for Cold-Formed Steel Framing Connections.
- D. AWS D1.3 - American Welding Society, Structural Welding Code, Sheet Steel.
- E. CBC California Building Code 2022, Chapter 22A

1.3 SUBMITTALS

- A. Provide product data on standard framing members. Describe materials and finish, product criteria, limitations and properties.
- B. Mill certificates: signed by the steel sheet producer indicating steel sheet complies with requirements.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Current member of SFIA and/or SSMA. Company specializing in steel studs framing and components and regularly and continuously engaged in the manufacturing of non-structural metal framing members for not less than five (5) years.
 - 1. SSMA: Steel Stud Manufacturers Associations, ICC ESR-3064P
 - 2. ClarkDietrich Building Systems, ICC ESR-1166P
 - 3. Cemco California Expanded Metal Products Company, ICC ESR-3016
- B. Welding: welders certified by AWS.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling as required in AISI's "Code of Standard Practice".

PART 2 - PRODUCTS

2.1 FRAMING MATERIALS

- A. Framing Members, General: Comply with ASTM C 955 for conditions indicated.
- B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grading and coating designation as follows:
 - 1. Grade: as required by structural performance.
 - 2. Coating: CP60, G60 (Z180), A60 (ZF180), AZ50 (AZM 150), or GF30 (ZGF90).
- C. Steel Sheet for Clips: ASTM A 1003 /A 1003M, ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G90 (Z275).
- D. Studs: ASTM A1003, Structural Grade 50, Type H (ST50H), sheet steel, formed to "wide flange" shape or "C" shape, punched web, 16 gauge (0.0538") thick unless noted otherwise on drawings, 50 ksi steel unless noted otherwise on drawings, sizes required to conform to details and scheduled wall thicknesses, and as required for structural performance. Studs shall be rolled from new sheet steel and shall not be produced from re-rolled steel.

1. Properties: As listed in manufacturer's standard tables for applicable grade of steel and sizes.
 2. Conform to AISI S100 and AISI S200.
 3. Coating: Zinc coated per ASTM A653, G60.
- E. Track: ASTM A1003, Structural Grade 50, Type H, sheet steel, channel shaped, deep leg, 16 gauge (0.0538") thick unless noted otherwise on drawings, 50 ksi steel unless noted otherwise on drawings, solid web, long leg at ceilings, profile to produce snug fit over adjacent components.
1. Conform to aisi S100 - Design of Cold-Formed Steel Structural Members.
 2. Approved pre-fabricated slotted slip track for top of wall: CEMCO Slotted Track (CST) 16 gauge, ICC ESR-2012 or equal as approved in accordance with Division 01, General Requirements for substitutions.
 3. Provide stand-off washers for fasteners.
 4. Install in accordance with manufacturer's recommendations and fire rating requirements.
 5. Coating: Zinc coated per ASTM A653, G60 [prime painted].
- F. Slotted Fire Track: CEMCO FAS Track ASTM A1003, Structural Grade 33, Type FI, cut steel channel shaped, deep leg, 16 gauge (0.056") thick unless noted otherwise on drawings, 33 ksi steel unless noted otherwise on drawings, solid web, long leg at ceilings, profile to produce snug fit over adjacent components. Track is designed with intumescent fire proofing on both sides of the track. Intumescent material to lap over the top of the track by 0.25" on each side of the track and down each leg 1.18" to an external groove. Slotted fire track shall be listed by UL Fire Resistance Directory as a firestop for the application used.
- G. Fire Strap: CEMCO FAS Strap ASTM A653, Grade 33 with a minimum 33 ksi yield strength to span between flutes of metal decking. Fire strap to have a minimum of a 1-inch wide continuous strip of intumescent running parallel and along each edge of the strap. Fire strap shall be listed by UL Fire Resistance Directory as a firestop for the application used.
- H. leader and Jambs: ClarkDietrich Building Systems, Heavy Duty Studs and Header Brackets.
1. ProX Header, Brady Construction Innovations Inc. or equal.
- I. Stiffener U - Channels and Angles: Minimum Weights as Follows:
1. 3/4 inch - .3 pound per foot, cold- or hot-rolled channel.
 2. 1-1/2 inches - .475 pound per foot, cold-rolled channel.
 3. 1-1/2 inches -1.12 pounds per foot, hot-rolled channel.
 4. 2 inches -1.26 pounds per foot, hot-rolled channel.
 5. 2 inches - .59 pound per foot, cold-rolled channel.

6. 1-1/2 x 1-1/2 x 3/16 inch angle.

2.2 ACCESSORIES

- A. Fastening: Self-drilling, Self-tapping Screws, ASTM C954, galvanized, Buildex / Tomarco Type S-12 point, low profile head screws #10 or equal, 1/2 inch long for two layers 16 gauge metal for non load-bearing framing, welded connections for load-bearing framing and for framing of 16 gauge studs and thicker.
- B. Welding: In conformance with AWS D1.3, minimum weld size 3/32".
- C. Anchorage Devices, Powder Actuated:
1. Install to conform to the load requirements of this Section and Tables 1, 2, 3 and 4 of ICC-ESR 1663 Hilti. Minimum diameter: 0.145" diameter.
 - a. Utilize tools as recommended by the manufacture in compliance with ICC numbers.
 - b. ICC-ESR 1663 Hilti Inc., Fasteners - Manual, Pneumatic, or Powder-Driven Steel Studs and Nails
 2. Allowable Loads: Limited 100 lbs. Maximum or 80% of ICC approved values. Testing required, refer to Division 01.
 3. Use of Powder actuated fasteners for tension loads is limited to support of minor loads such as suspended acoustical ceilings, ductwork and conduit. Permissible Loads for Ceiling Clip Assembly:
 - a. Normal-Weight Concrete: Ceiling Clip Assembly, minimum 0.177 inch diameter, minimum penetration 1-1/2 inch. Required Allowable Loads: 100 lbs. or 80 percent of values listed in ICC Report whichever is less: ICC ES-2184.1) Type CC27ALH42 w/DX KWIK, by Hilti, Inc., Tulsa, OK.
 - b. Lightweight Concrete: Ceiling Clip Assembly, minimum 0.177 inch diameter, minimum penetration 1-1/4 inch. Required Allowable Loads: 100 lbs. or 80 percent of values listed in ICC ES-2184:
 - 1) Type CC27ALH32, by Hilti, Inc., Tulsa, OK.
- D. Anchorage Devices, Drilled Expansion Anchors:
1. Wedge Type: KWIK Bolt TZ2 Concrete Anchor, 3/8- to 3/4-inch diameter, ICC ESR-4266, by Hilti Inc., Tulsa, OK.
 - a. Eyebolt HHDCA drill-in anchor for suspended ceilings. Provide minimum 1/4-inch size anchor, requires testing refer to Division 01.
 2. Adhesive Anchors System:
 - a. For fully grouted CMU, lightweight concrete, construction per.
 - b. For Normal Weight concrete with min. compressive of 2,500 psi or 4000 psi. Per ICC ESR-2322, Hilti HIT-RE 500-SD Adhesive Anchor System.
 - c. Per DSA IR- 19-1 Expansion Bolts or Epoxy-Type Anchors in Concrete.
- E. Masonry Anchors: 1/4" diameter, Tapcon with Advance Threadform Technology, heat-treated steel, by Illinois Tool Work/Buildex, ICC-ESR-1671. Slotted Hex Washer Head.

2.3 FINISHES

- A. Galvanized Finish: Zinc coated per ASTM A653, G60.
- B. Primer: Manufacturer's standard, low VOC epoxy, red color, air dried to minimum 0.001 inch or 0.026 mm thickness.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that substrate surfaces and building framing components are ready to receive work.
- B. Beginning of installation means acceptance of existing conditions.
- C. Layout markings shall not be made with xylene-based inks, paint, or dyes, or with other solvent-based products that may bleed through finishes.

3.2 ERECTION OF STUDDING

- A. Install cold-formed steel framing in accordance with ASTM C 1007 and AISI S240 "North American Standard for Cold-Formed Steel Framing - General Provisions", and manufacturer's written instructions unless more stringent requirements are indicated.
- B. Align floor and ceiling tracks; locate to wall or partition layout. Secure in place with specified fasteners at spacing as indicated on drawings or maximum 32 inches on centers.
 - 1. Set floor track on continuous sealant, each side of track for exterior walls. Sealant type: Butyl Rubber per ASTM C920.
 - 2. Track Splices: notch flanges to allow sliding tracks past each another 12". Attach as approved by manufacturer of system.
- C. Place studs at 16 inches oc typically, or 12 inches oc in plumbing walls or as noted on drawings. Connect studs to tracks using fastener or welding method.
- D. No flame (oxyacetylene) torch cutting is permitted, use Plasma Arc cutting to make penetrations for conduit or piping where required.
- E. Construct corners using minimum three studs.
- F. Install double (boxed) studs at each head, jamb and sill of each exterior and interior door and window opening. Extend studs from floor to underside of structure above. Weld all boxed jamb and header members with interrupted 1/8" welds, one inch long at 12 inches on center.
- G. Install 1-1/2 inch standard steel furring channels at right angles to king stud at each door hinge point as permitted by perforations. Weld channel to four studs where possible.
- H. Stiffeners: Install 3/4 inch standard steel furring channel stiffeners within 24 inches of top and bottom runners and at mid height of walls eight feet high. At higher walls, install stiffeners spaced maximum 48 inches on centers. Weld stiffeners to each stud and at laps.

- I. In areas where a finish material occurs on one side of wall only, provide full width bridging or bracing. Two systems permitted:
 - 1. Install 3/4 inch x 16 gauge continuous brace through stud punch-outs, fastened to studs with angle clips welded or screw fastened, spaced as scheduled below.
 - 2. Install 1-1/4 inch x 16 gauge strap, 3/4 inch x 16 gauge or cold-rolled channel continuous across unrestrained edges of studs spaced as scheduled below, screw fastened or welded to each stud, and connected to one blocking member screw fastened or welded to adjacent studs.
- J. Bridging or Bracing Schedule:

Stud Size AISI/SFIA/SSMA Min. bracing spacing unless noted otherwise on structural drawings.

3-5/8 or 4 in, S-Sections ("c") 2'-6'
3-5/8 or 4 in, T-Sections ("w") 3'-0'

6 in, S-Sections ("c") 2'-6'
6 in, T-Sections ("w") 3'-0'
- K. Erect studs one piece full length. Splicing of studs is not permitted, except where detailed.
 - 1. Where studs have been cut to receive piping conduits and equipment, weld on two 3/4 inch furring channels to restore stability of weakened stud.
- L. Erect studs, brace and reinforce full strength to meet design requirements.
- M. Extend stud framing through ceiling to underside of floor or roof structure above unless detailed otherwise.
- N. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- O. Install intermediate studs above and below openings to match wall stud spacing.
- P. Provide deflection allowance of 1/2 inch minimum in stud track, directly below horizontal building framing for non-load bearing framing.
- Q. Attach backing as detailed on the drawings for attachment of fixtures anchored to walls.
- R. Install framing between studs for attachment of mechanical and electrical items and to prevent stud rotation.
- S. Touch-up field welds and damaged primed surfaces with primer.
- T. Erect 2 stud construction at expansion joints, 20 feet on center or as indicated on Drawings.

3.3 CEILING JOIST FRAMING

- A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, punched with enlarged service holes, with stiffened flanges, and as follows:

1. Minimum Base-Steel Thickness:
 - a. 20 GA (0.0329 inch)
 - b. 18 GA (0.0428 inch)
 - c. 16 GA (0.0538 inch)
 - d. 14 GA (0.0677 inch)
 - e. 12 GA (0.0966 inch)
2. Flange Width: 1-5/8 inches, minimum unless noted otherwise on structural drawings.
3. Install per drawings and conform to SFIA / SSMA.

3.4 INSTALLATION - GYPSUM SHEATHING

- A. Erect exterior gypsum sheathing with long joints perpendicular to framing, with edges butted tight and ends occurring over framing. Install sheathing with glass-mat face exposed to exterior. Install with screws in accordance with ASTM C754 and C840 and GA 216.

3.5 TOLERANCES

- A. Maximum Variation from True Position: 1/8 inch in 10 feet.
- B. Maximum Variation of any Member from Plane: 1/8 inch.

3.6 CLEANING

- A. Clean substrate: remove dirt, oil, grease, construction markings, and foreign matter that could adversely affect final floor finish appearance or performance.

3.7 QUALITY CONTROL

- A. Inspection of all field-welding operations shall be performed by qualified and certified Welding Inspector approved by the Structural Engineer and DSA.
- B. Welding Inspector shall check materials, equipment, procedures, welds and certification of welders. Furnish the Owner with reports verified by the Inspector that welding has been performed in accordance with the Contract Documents.

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SECTION 05 50 00 – METAL FABRICATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Shop fabricated ferrous metal items, galvanized and prime painted.
- B. Related Sections
 - 1. Section 05 52 13, Pipe and Tube Railings.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. American Society of Mechanical Engineers (ASME)
 - 1. ASME B18-Fasteners
- C. ASTM International
 - 1. ASTM A36/A36M Carbon Structural Steel
 - 2. ASTM A48/A48M Gray Iron Castings
 - 3. ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc-coated Welded and Seamless.
 - 4. ASTM A123 Zinc (Hot-Dip Galvanized) on Coatings on Iron and Steel Products
 - 5. ASTM A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 6. ASTM A283/A 283M Low and Intermediate Tensile Strength Carbon Steel Plates
 - 7. ASTM A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
 - 8. ASTM A325 - Structural Bolts, Steel, Heat Treated, 120/105ksi Minimum Tensile Strength
 - 9. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes
 - 10. ASTM A513 - Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing
 - 11. ASTM A563 - Carbon and Alloy Steel Nuts
 - 12. ASTM A653/A 653M Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 13. ASTM A780 - Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 14. ASTM A786/A 786M Rolled Steel Floor Plates
 - 15. ASTM A992 Structural Steel Shapes
 - 16. ASTM B633 - Electrodeposited Coatings of Zinc on Iron and Steel

17. ASTM C1107 - Packaged Dry Hydraulic - Cement Grout (Non-Shrink)
18. ASTM D520 - Zinc Dust Pigment
19. ASTM F1554 - Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
- D. American Welding Society (AWS)
 1. AWS A2.4 - Standard Symbols for Welding, Brazing and Non-Destructive Examination
 2. AWS A5.1 - Carbon Steel Covered Arc-Welding Electrodes
- E. ASCE/SEI 7-16 - American Society of Civil Engineers, Structural Engineers Institute, ASCE Standard.
- F. California Code of Regulations (CCR)
 1. Title 8, Chapter 3.2
 2. Title 8, Division 1, Subchapter 7, Group 1, Article 4, Section 3277, Fixed Ladders
 3. Cal/OSHA, Subchapter 4 Construction Safety Orders
 4. Title 24, Part 2, 2022 California Building Code (CBC), Chapter 22A.
 5. Title 24, California Fire Code Chapter 35 Welding and Other Hot Work.
- G. National Ornamental & Miscellaneous Metals Association (NOMMA)
 1. NOMMA Guidelines - Guideline 1 Joint Finishes
- H. SSPC - The Society for Protective Coatings
 1. Paint 20 - Zinc-Rich Coating (Type I Inorganic and Type II Organic)
 2. SP-2 - Steel Preparation
- I. MIL - Military Specifications, United States Department of Defense
 1. P-21035 - Paint, High Zinc Dust Content, Galvanizing Repair
- J. MPI - Master Painters Institute Approved Products List
 1. 18 - Primer, Zinc Rich, Organic
 2. 19 - Primer, Zinc Rich, Inorganic

1.3 SUBMITTALS

- A. Shop Drawings. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories.

Include erection drawings, elevations and details where applicable. Indicate welded connections using standard AWS A2.4 Welding Symbols. Indicate net weld lengths.
- B. Welder Certifications.

- C. Manufacturer's Certificates certifying welders employed on the work have been AWS qualified within the previous 12 months, in accordance with AWS-WHB-1.
- D. Written Welding Procedure Specification (WPS).

1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to the following
 1. AWS D1.1, Structural Welding Code-Steel.
 2. AWS D1.3, Structural Welding Code-Sheet Steel.
 3. AWS D1.8, Structural Welding Code - Seismic Supplement.
 4. AWS Certified welders.
 5. AWS - American Welding Society
 6. AWS A2.4 Standard Symbols for Welding, Brazing and Non Destructive Examination
 7. DSA-Projects: All welding shall be specially inspected by an AWS-CWI Qualified Inspector.
- B. Coating applicator - Galvanized Metal Fabrications: Company specializing in hot-dip galvanizing after fabrication and following the procedures in the Quality Assurance Manual of the American Galvanizers Association.

1.5 FIELD MEASUREMENTS

- A. Verify field measurements.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

- A. Steel Sections: ASTM A992 for W-Shape sections and ASTM A36 for all other members.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Bending or cold-formed steel: ASTM A283, Grade C.
- D. Floor/Stair Plate: ASTM A786, Pattern No. 5, medium pattern, raised lug pattern, 12 gauge. Steel ASTM A36 or ASTM A283 Mild Steel, Grade C or D.
- E. Steel Round Structural Tubing: ASTM A500, Grade C, minimum yield strength, 46 ksi.
- F. Structural Tubing: Hollow Structural Sections (HSS), ASTM A500, Grade B, minimum yield strength, 42 ksi.

- G. Pipe: ASTM A53, Grade B, Type E or S, Schedule 40, galvanized unless noted painted.
- H. Mechanical Tubing: ASTM A 513 hot- or cold-rolled carbon steel for non-structural tubing, electric welded tubing.
- I. Abrasive-Surface: for stair rungs, floor plate, with abrasive material metallically bonded to steel by a proprietary process, OSHA compliant

2.3 FASTENERS

- A. General: Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563 and ANSI B18.2.1; and, where indicated, flat washers and ASTM A325 as indicated on drawings.
- C. High Strength Bolts ASTM A325.
- D. Anchor Bolts ASTM F1554, Grade 36.
- E. Machine Screws ASME B18.6.3.
- F. Lag Bolts ASME B18.2.1.
- G. Wood Screws Flat head, carbon steel, ASME B18.6.1.
- H. Plain Washers Round, carbon steel, ASME B18.22.1.
- I. Lock Washers Helical, spring type, carbon steel, ASME B18.21.1.
- J. Eyebolts: for wood, steel or concrete construction, Stainless steel Type 304. 1/4" shoulder pattern, rated 500 lbs. minimum. Epoxied in Concrete where indicated.
- K. Threaded rods, steel yokes and plates.
- L. Self-drilling, self-tapping screws, ASTM C954, galvanized, minimum #10 unless noted otherwise on drawings. By Buildex/Tomarco or equal.
- M. Anchorage Devices, Drilled Expansion Anchors Minimum 5/8-inch diameter with 3 inch embedment unless noted otherwise on drawings. Allowable shear and tension values as permitted in ICC-ES, ESR-4266 Hilti Kwik Bolt TZ2 Concrete Anchor or Hilti Kwik Bolt 3, ESR-2302 for masonry anchors, by Hilti Inc., Tulsa, OK, or in ICC-ES ELC-2502, DeWalt Power-Stud+SD2 concrete anchor or DeWalt Power-Stud+ SD1, ESR-2966 for masonry anchors, by Dewalt, Towson, MD.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primer: Fabricator's rust inhibitive primer suitable for finish scheduled in Section 09 90 00 equal to L69 Hi Build Epoxoline II @ 3-4 mils DFT primer, red color, air dried, by Tnemec.
- B. Galvanizing Repair Compound: ASTM D520 Type III, MIL-P-21035, SSPC-Paint 20, or MPI #18 or 19. Touch-Up products for Galvanized Surfaces Ready mixed Zinc rich galvanizing compound, 95% zinc.

1. Finish: Galvilite by ZRC Products Company, Marshfield, MA or equal. Reflective Metallic Sheen for exposed galvanized finish.
 2. Finish: ZRC Products Company, Marshfield, MA or equal. Primer for repaired galvanized to receive a painting finish.
- C. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- D. Grout ASTM C1107, Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 8,000 psi at 7 days; of consistency suitable for application and a 30 minute working time.
- E. Safety Stair Nosings Cast-in-Place, Style B-41A, extruded aluminum, 4 inches wide manufactured by Barrycraft Pattern and Foundry, Inc., Birmingham, AL, or equal as approved in accordance with Division 01, General Requirements for substitutions. Provide 2" strip contrasting colors (70% contrasting) full width of step, 1" maximum from edge of nosing of each exterior tread and top landing (upper approach), and top and bottom steps of interior stairs unless nosing are indicated at all steps on drawings, CBC Section 11B-504. Colors to be selected by Architect.

2.5 FABRICATION

- A. Fit and shop assemble in largest practical sections for delivery to site.
- B. Ease exposed edges to small uniform radius.
- C. Fabricate items with joints tightly fitted and secured.
- D. Welded Joints. Seal joined members by continuous welds. Dress welded joints, leaving no burrs, or sharp or abrasive corners, edges or surfaces.
1. Where exposed to view, dress welds in accordance with NOMMA Guidelines for Finish 1.
 2. Where concealed, dress welds in accordance with NOMMA Guidelines for Finish 3.
- E. Exposed Mechanically Fastened Joints. Make exposed, mechanically fastened joints hairline-tight, flush, butt joints. Secure with flush-mount, countersunk, screws or bolts. unobtrusively located, consistent with design of component, except where specifically indicated otherwise.
- F. Provide components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as related metal fabrication, unless expressly indicated otherwise.

2.6 FINISHES

- A. Steel and Iron
1. Clean surfaces of rust, scale, grease and foreign matter prior to finishing. Prepare in accordance with SSPC SP-2.

2. Galvanize steel items to zinc coating thickness in accordance with ASTM A123, minimum Coating Grade 80 (1.9 oz/sq. ft.). Surfaces shall be free of icicles, spangles and puddling. Provide venting holes at all enclosed sections, "V" notch, and drilled holes are acceptable. Locate to prevent rainwater from entering enclosed sections at exterior galvanized items. For sheet steel items, galvanize per ASTM A653 G60 Coating Designation.
 3. Galvanized items to be painted: Do not use quenching solutions or treatments immediately after galvanizing. Refer to individual sections for galvanized items to be painted and to Section 09 90 00.
 4. Do not prime surfaces in direct contact with concrete or where field welding is required.
 5. For painted surfaces, prime items with two coats in accordance with requirements of primer specified herein.
 6. Color Coated with Finish Special Coatings in accordance with Section 09 90 00 Painting for exposed surfaces.
- B. Apply two coats of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious materials or between dissimilar metals. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Do not begin installation until unsatisfactory conditions are corrected. Beginning installation means acceptance of existing conditions including the preparatory work of others, if any.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Allow for erection loads and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on shop drawings.
 1. Weld joints using shielded metal-arc welding (SMAW) method. Use coated welded rods, not fluxed, or type recommended by manufacturer for use with parent metal. Use only certified welders for structural construction.
 2. Grinding: Grind welds on surfaces subject to traffic or contact to smooth flush joints.

3. Peening: Remove flux and weld spatter as necessary to eliminate unsightly conditions and grind off sharp projections.
 4. Permanently Concealed Welds: No treatment required other than preparation for painting or galvanizing.
- D. Perform field welding in accordance with AWS standards and procedures for metal alloy welded.
- E. Obtain Architect approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions and surfaces not shop primed except surfaces to be in contact with concrete.
- G. Repair of Galvanized Surfaces: Ready mixed, zinc-rich galvanizing compound, ASTM A780 - A2. Repair Using Paints Containing Zinc Dust, minimum thickness 5 mils.
- H. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
1. Cast Aluminum: Heavy coat of alkali-resistant bituminous paint.
 2. Extruded Aluminum: Two coats of clear lacquer.

3.4 ERECTION TOLERANCE

- A. Maximum Variation From Plumb 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment 1/4 inch.

3.5 FINISHES

- A. Paint with Gloss Polyurethane High Performance Coatings in Special Coatings per Section 09 90 00 Painting.

3.6 SCHEDULE

- A. Schedule is list of principal items only. Refer to Drawing details for items not specifically scheduled.
- B. Fasteners: Provide fasteners and connectors of approved types, whether indicated or not.
- C. Interior Vertical Access Ladder: minimum 16 inch ID wide tread surface on rungs.
1. Side Rails: 3/8 inch by 2 1/2" inch steel bar.
 2. Rungs: 3/4-inch diameter solid steel rod spaced 12 inches on center vertically with knurled or skid-resistant surface.
 3. Mounting Brackets: 3/8-inch thick L-bent plate 8-1/2-inches by 2 1/2"-inch legs, 4-inches deep, fabricated to provide 7 inches clearance from wall surface. Furnish steel wall backing plates, brackets, and anchors required for 48 inches, maximum on center spacing.
 4. Ladder safety post: Bilco LadderUP Safety Post Model LU-2, hot-dip galvanized steel construction, or equal, telescoping tubular section with automatic lock when extended. Upward and downward movement controlled by stainless special alloy steel spring balancing mechanism. Secure to ladder rungs with

manufacturer's fasteners.

5. Ladder Safety Device Saf-T-Climb manufactured by North Safety Products or approved equal. Provide according to Code of Federal Regulations 29 CFR 1910.27 and ANSI A14.3.
 6. Cage for Ladder over 20 feet 1/4 by 2 inch hoops at 4 feet on centers, 7-3/16 by 1-1/2 inch vertical bars, solid riveted. Per Title 8, CCR, Construction Safety Orders.
 7. Elevator pit ladders shall have rungs spaced 7 inches from wall.
 8. Finish: paint per Section 09 90 00.
- D. Exterior Vertical Access Ladder Steel 16 inches ID wide minimum. Galvanized Steel, rungs of 3/4-inch diameter solid rod steel spaced 12 inches on center; install 7 inches from wall surface, rungs to have knurled or skid-resistant surface; mount with 3/8 inch thick bent plate 8-1/2-inches by 2 1/2"-inch legs, 4-inches deep, fabricated to provide 7-inches clearance from wall surface. Furnish steel wall backing plates, brackets, and anchors required for 48-inches, maximum on center spacing, galvanized and painted steel front and side panels 1/8 inch thick, with front panel hinged and u-bolt and slot for security padlock, min. height 8 feet. Attach side panels with 3 welded clip angles each side bolted to wall and welded to ladder.
1. Cage for Ladder over 20 feet 1/4 by 2 inch hoops at 4 feet on centers, 7-3/16 by 1-1/2 inch vertical bars, solid riveted. Per Title 8, CCR, Construction Safety Orders.
 2. Ladder Safety Device Saf-T-Climb manufactured by North Safety Products or approved equal. Provide according to Code of Federal Regulations 29 CFR 1910.27 and ANSI A14.3.
 3. Parapet railing at exterior access ladders 42 inches above top rung, extending 24 inches horizontally and return to roof. Space between railings 24 inches.
 4. Finish: Paint per Section 09 90 00.
- E. Door Frames for Overhead Door Openings and Wall Openings Channel sections galvanized finish.
- F. Grates and Frames: Provide all grating assemblies, covers and frames for catch basins, trench and storm drains. All Work shall be galvanized cast iron. Provide heavy-duty traffic trench type gratings, covers and frames in all traffic areas; manufactured by Alhambra Foundry Co., Alhambra, CA, McKinley Iron Works, Fort Worth, TX, or Neenah Foundry Co., Neenah, WI, Barry Pattern and Foundry Co, Inc, or equal as approved in accordance with Division 01, General Requirements for substitutions.
1. Gratings in traffic areas shall be narrow slot type, with openings not greater than 1/2 inch with direction of slots placed perpendicular to direction of traffic.
 2. Covers shall be provided with recessed bolt attachment to frame.

END OF SECTION

SECTION 05 52 13 – PIPE AND TUBE RAILINGS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Free-standing railings at steps or ramps.

1.2 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Embedded items, welding and shop painting.

1.3 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- E. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- F. NAAMM AMP 521 - Pipe Railing Systems Manual.
- G. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").

1.4 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 1. Prepare shop drawings for all railing systems, including attachment.
 - 2. Conform to AISC Standards, except provisions for approval/responsibility for dimensions by Architect and structural engineer shall not apply.
 - 3. Include erection drawings, elevations, and details where applicable.
 - 4. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
- C. Samples: Submit two, 8 inch long samples of handrail. Submit two samples of infill panel.

1.5 QUALITY ASSURANCE

- A. Welder's Qualifications: Welding shall be performed by certified welders qualified in accordance with procedures specified in AWS D1.1/D1.1M, using materials, procedures and equipment of the type required for this work.
- B. Coordination: Provide templates and sleeves for incorporation of embedded items into the work specified elsewhere herein.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Delivery, Storage and Handling, General: Protect products from deformation, marring, discoloration, soiling and corrosion.
- B. Storage: Store products in enclosed, well-ventilated spaces, not in contact with soil or vegetation and not subject to inclement weather.

PART 2 - PRODUCTS

2.1 RAILINGS - GENERAL REQUIREMENTS

- A. Regulatory Requirements: Conform to California Building Code (CBC), Title 24, Part 2, Section 11B-505 and 11B-405.8 as amended and adopted by authorities having jurisdiction.
 - 1. Top of gripping surfaces of handrails shall be 34 inches minimum and 38 inches maximum vertically above walking surfaces, stair nosings, and ramp surfaces. Handrails shall be at a consistent height above such surfaces.
 - 2. Clearance between handrail gripping surfaces and adjacent surfaces shall be 1-1/2 inches minimum.
 - a. Handrail may be located in a recess if the recess is 3 inches maximum deep and 18 inches minimum clear above the top of the handrail.
 - 3. Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20% of their length.
 - a. Where provided, horizontal projections shall occur 1-1/2 inches minimum below the bottom of the handrail gripping surfaces.
 - 4. Handrail gripping surfaces with a circular cross section shall have an outside diameter of 1 1/2" inch.
 - 5. Handrail gripping surfaces with a non-circular cross section shall have an outside dimension of 4 inches minimum and 6-1/4 inches maximum, and a cross-sectional dimension of 2-1/4 inches maximum.
 - 6. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.

7. Handrails shall not rotate within their fittings.
8. Handrail gripping surfaces shall extend beyond and in the same direction of stair flights and ramp runs in accordance with CBC Section 11B-505.10.
 - a. Such extensions are not required for continuous handrails at the inside turn of switchback or dogleg stairs and ramps.
9. A 2 inch minimum high curb or a barrier shall be provided to prevent the passage of a 4 inch diameter sphere rolling off the sides of a ramp surface.
 - a. Such a curb or barrier shall be continuous and uninterrupted along the length of a ramp. CBC Section 11B-405.9.2
- B. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- C. Allow for expansion and contraction of members and building movement without damage to connections or members.
- D. Dimensions: See drawings for configurations and heights.
 1. Top Rails and Wall Rails: 1-1/2 inches outside diameter, round.
 2. Intermediate Rails: 1-1/2 inches diameter, round.
- E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 1. For anchorage to stud walls, provide backing plates, for bolting anchors.
- F. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.2 STEEL RAILING SYSTEM

- A. Steel Tube: ASTM A500/A500M, Grade B cold-formed welded or seamless structural tubing.
- B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black and galvanized finish, as indicated, seamless or welded.
- C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- D. Exposed Fasteners: No exposed bolts or screws.
- E. Straight Splice Connectors: Steel concealed spigots.
- F. Galvanizing: In accordance with requirements of ASTM A123/A123M.

1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.

2.3 FABRICATION

- A. Fabricate railings in accordance with NAAMM AMP 521 and as required for specified design requirements. Provide stock and tubing and manufactured components sized and arranged as indicated on Drawings and specified herein.
- B. Accurately form components to suit specific project conditions and for proper connection to building structure.
 1. Prior to fabrication, field verify dimensions and details of construction. Immediately report variances in writing to Architect.
- C. Fit and shop assemble components in largest practical sizes for delivery to site.
- D. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- E. Welded Joints:
 1. Exterior Components (Type 2): Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 2. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius (1/8 inch).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Coordination: Coordinate fabrication and installation of steel pipe and tube railings so that related Work accurately and properly join.

3.2 PREPARATION

- A. Obtain Architect's review prior to site cutting or making adjustments not indicated on shop drawings.
- B. Supply items required to be cast into concrete with setting templates, for installation as work of other sections.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

- C. Install railings in compliance with CBC 11B and ADA Standards for accessible design at applicable locations.
- D. Anchor railings securely to structure.
- E. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.
- F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.4 TOLERANCES

- A. Code required dimensions indicated on Drawings as minimum or maximum are absolute. No tolerances are allowed less or more than this dimension.
- B. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- C. Maximum Offset From True Alignment: 1/4 inch.
- D. Maximum Out-of-Position: 1/4 inch.

3.5 CLEANING AND PROTECTION

- A. Galvanizing Repair Compound:
 - 1. If finish is to be painted or is otherwise not visible, field repair with premixed cold galvanizing compound for field touch-up of galvanized coatings.
 - 2. Where the finish is galvanized, resend to galvanizing for reapplication, if practical (e.g.; bolted components) and accepted by Architect.
- B. Cleaning:
 - 1. Clean and dress all field welds, bolted connections, and abraded areas of galvanizing or shop paint on miscellaneous metal.

END OF SECTION

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SECTION 06 20 00 - FINISH CARPENTRY - INSTALLATION OF DOORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Installation of hollow metal doors.
- B. Installation of door hardware and attachment accessories.
- C. Wood blocking backing and nailers.
- D. Related Sections:
 - 1. Section 01 35 42, CALGreen Requirements.
 - 2. Section 08 12 13, Hollow Metal Frames - Welded.
 - 3. Section 08 13 13, Hollow Metal Doors.
 - 4. Section 08 71 00, Door Hardware.
 - 5. Section 09 90 00, Painting.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. ADA - Americans with Disabilities Act of 1990
 - 1. ADA Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.
- C. APA - The Engineered Wood Association.
 - 1. APA Guide - APA Design and Construction Guide
- D. BHMA - Builders Hardware Manufacturers Association
 - 1. BHMA A156.1 through 24-Standards
- E. CBC 2022 California Building Code.
- F. California Green Building Standards Code, CALGreen - 2022.
- G. CBC - 2022 California Building Code
 - 1. CBC-10 - CBC Chapter 10, Means of Egress
 - 2. CBC - 2022 - CBC Chapter 11B, Accessibility to Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing
- H. CRSC - California Referenced Standards Code (CCR Title 24, Part 12)
 - 1. CRSC-7A.2 - Standard 12-7A-2, Exterior Windows

- 2. CRSC-7A.4 - Standard 12-7-4 Fire Resistive Standards, Fire Door Assemble Tests
- 3. CRSC-10.2 - Standard 12-10-2 Single Point Latching or Locking Devices
- 4. CRSC-10.3 - Standard 12-10-3 Emergency Exit and Panic Hardware
- I. ITS-WH - Intertek Testing Services-Warnock-Hersey
- J. NFPA - National Fire Protection Association
 - 1. NFPA 80 - Fire Doors and Windows
 - 2. NFPA 105 - Smoke Door and Window Assemblies
 - 3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies
- K. PS - U.S. Department of Commerce, Product Standard
 - 1. PS-1 - Construction and Industrial Plywood
 - 2. PS-2 - American Softwood Lumber Grading Standards
- L. SDI - Steel Door Institute
 - 1. SD1-107 - Hardware on Steel Doors.
 - 2. SDI-109 - Hardware for Standard Steel Doors and Frames.
 - 3. SDI-122 - Installation for Standard Steel Doors and Frames.»>
- M. UL - Underwriters Laboratories, Inc.
 - 1. UL-10B - Fire Test of Door Assemblies
 - 2. UL 10C - Positive Pressure Fire Tests of Door Assemblies
 - 3. UL1784-Air Leakage Test for Door Assemblies

1.3 SUBMITTALS

- A. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code per 1.04.B.

1.4 QUALITY ASSURANCE

- A. Acceptable Lumber Grading Associations
 - 1. PLIB - Pacific Lumber Inspection Bureau
 - 2. RIS - Redwood Inspection Service, a division of the California Redwood Association.
 - 3. WCLIB - West Coast Lumber Inspection Bureau
- B. WWPA - Western Wood Products Association

- C. All Plywood shall be free of urea-formaldehyde binders and adhesives.
- D. California Green Building Standards Code, CALGreen - 2022.
 - 1. Adhesives, sealants, primers, and caulks shall comply with air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, per CALGreen Tables 5.504.4.1 and 5.504.4.2.
 - 2. Paints and Coatings shall comply with VOC limits in Table 1 of the ARB, per CALGreen Table 5.504.4.3
 - 3. Composite wood products (plywood, particle board, medium density fiberboard) shall comply with Formaldehyde limits per CALGreen Table 5.504.4.5.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials in ventilated, interior locations.

PART 2 - PRODUCTS

2.1 DOOR MATERIALS

- A. Hollow Metal Doors: As specified in Section 08 13 13.
- B. Door Hardware: As specified in Section 08 71 00, Door Hardware.

2.2 ACCESSORIES

- A. Nails: Size and type to suit application, plain finish.
- B. Bolts, Nuts, Washers, Blind Fasteners, Lags, and Screws: Size and type to suit application: plain finish, galvanized when exposed to weather.
- C. Primer: 100-percent acrylic resin, water reducible paint suitable as base coat for finish scheduled in Section 09 90 00 and as indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that openings are ready to receive Work and field measurements are as indicated on shop drawings.
- B. Verify mechanical, electrical and building items affecting Work of this Section are placed and ready to receive this Work.
- C. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION OF HOLLOW METAL DOORS

- A. Install doors in accordance with SDI ANSI A250.11/105 and SDI 122 recommendations.
- B. Coordinate installation of glass or louvers where indicated.

3.3 INSTALLATION OF HARDWARE

- A. Install hardware in accordance with Section 08 71 00, Door Hardware.
- B. Exit Devices shall comply with in accordance with CBC 2022 Sections 1008.1.9 and 11B-404.2.7, mounted 34 inches to 44 inches above finish floor, comply with Standard 12-10-3. The unlatching force shall be by Authority having Jurisdiction and may increase the maximum effort to operate doors required to be fire rated to achieve positive latching, but in no case shall the pressure exceed 15 pounds per CBC Section 11B-404.2.9 when applied in the direction of exit travel.
- C. Conform to SDI-107 and SDI-109 for hardware on steel doors.
- D. Fire doors and frames assembly shall be installed in accordance with their listing per NFPA No. 80 and testing per NFPA 252, CRSC California Referenced Standards Code, Standard 12.7.4 and the manufacturer's instructions.
 - 1. Glazing in door assemblies: Test in accordance with Section 716.5.3.2, 2022 CBC, and NFPA 257.

3.4 INSTALLATION TOLERANCES

- A. Conform to standard of flatness and squareness as required by SDI-117. Maximum Diagonal Distortion: 1/16 inch measured with straight edge corner to corner, or as required to meet door warranty.

3.5 FIELD QUALITY CONTROL

- A. Provide testing certification of fire-rated door assemblies in accordance with CBC Section 716.5 and Fire-Resistive Standard 12-7-4.
- B. Provide manufacturer's installation instructions for each listed assembly for review by the Inspection Authority.

3.6 ADJUSTING AND CLEANING

- A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 07 21 00 - INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Thermal insulation in exterior wall construction.
- B. Sound attenuation insulation in interior partition construction.
- C. Related Requirements:
 - 1. Energy calculations or prescriptive compliance documents.
 - 2. Section 01 35 42, CALGreen Requirements.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. ASTM - American Society for Testing and Materials
 - 1. ASTM C 165 - Test Method for Measuring Compressive Properties of Thermal Insulations
 - 2. ASTM C 356 - Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heat
 - 3. ASTM C 612 - Mineral Fiber Block and Board Thermal Insulation
 - 4. ASTM C 665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
 - 5. ASTM C 1104 - Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation
 - 6. ASTM C 1304 - Test Method for Assessing the Odor Emission of Thermal Insulation Materials
 - 7. ASTM C 1338 - Test Method for Determining Fungi Resistance of Insulation Materials and Facings
 - 8. ASTM D 816 - Rubber Cements
 - 9. ASTM E 84 - Surface Burning Characteristics of Building Materials
 - 10. ASTM E 96 - Test Methods for Water Vapor Transmission of Materials
 - 11. ASTM E 136 - Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.
- C. CBC - 2022 California Building Code
 - 1. CBC-7 - CBC Chapter 7, Fire and Smoke Protection Features.
 - 2. Section 120, in conformance with ASTM E-84 or UL 723-Standard for Test for Surface Burning Characteristics of Building Materials.

- D. 2022 California Energy Code, Title 24, Part 6, Subchapter 3, Section 140.3.
- E. California Green Building Standards Code, CALGreen - 2022.
- F. SCAQMD - South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications.

1.3 PERFORMANCE REQUIREMENTS

- A. Materials shall provide continuity of thermal barrier at building enclosure elements.
- B. Materials shall provide continuity of sound barrier at designated room enclosure elements.
- C. Materials shall conform to Section 720 Thermal and Sound Insulating Requirements, California Building Code and Section 110.8 California Energy Code.
- D. Thermal Resistance: R values to achieve overall assembly U-Factor no greater than applicable value in Table 140.3-B California Energy Code unless noted otherwise in T-24 Energy Report.

1.4 SUBMITTALS

- A. Product Data: Provide data on product characteristics, performance criteria and methods of installation.
- B. Three samples of each material specified minimum 12 inches square. Provide fasteners, clips and other accessories.
- C. Certification of Compliance with Section 110.8(a) California Energy Code, 2022 and Part 12, Title 24, CCR Standards for Insulating Materials Chapter 12-13, Section 12-13-1555.
- D. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code per 1.05.B.

1.5 QUALITY ASSURANCE

- A. Provide U-value limits in accordance with Section 140.3, Table 140.3-B of 2022 California Energy Code, Title 24 Part 6 California Code of Regulations.
- B. California Green Building Standards Code, CALGreen - 2022.
 - 1. Adhesives, sealants, primers, and caulks shall comply with air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, per CALGreen Tables 5.504.4.1 and 5.504.4.2.
 - 2. Paints and Coatings shall comply with VOC limits in Table 1 of the ARB, per CALGreen Table 5.504.4.3.
 - 3. Recycled Content: requirements per Section A5.405.4 CALGreen code.

- C. Adhesives shall comply with VOC content limits defined by SCAQMD Rule 1168.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of following manufacturers form basis for design and quality intended.
1. Johns Manville Insulations, Commercial/Industrial Division, Denver, CO.
 2. Certainteed Corporation, Valley Forge, PA.
 3. Owens - Corning, Toledo, OH.
 4. Thermafiber Division of USG Corp., Wabash, IN.
- B. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.2 MATERIALS - THERMAL

- A. Batt Insulation: ASTM C665, Type III, Class A, Category 1. Preformed, foil faced, formaldehyde-free glass fiber batt insulation, with tabs, Johns Manville FSK-25, or equal. Conforming to following:
1. Thermal Resistance: R values to achieve overall assembly U-Factor no greater than applicable value in Table 140.3-B CEC unless noted otherwise in T-24 Energy Report.
 2. Batt Size: As required to fully fill cavity width and height or length.
 3. Thickness: As required to meet specified R-value without compression.
 4. Facing: Faced on one side with flame resistant foil facing.
 5. Flame Spread: Less than 25, ASTM E 84.
 6. Smoke Developed Rating: Maximum 50, ASTM E 84.
 7. Permeance: 0.05 perms, ASTM E 96.
 8. Recycled Content: Minimum 30 percent.

2.3 MATERIALS - SOUND

- A. Sound Attenuation Insulation: ASTM C665, Type I; preformed glass fiber, formaldehyde-free, "Sound Control Batts", acoustical fiber glass insulation, by Johns Manville or equal. Conforming to the following:
1. Size: As required to fully fill cavity width and height.
 2. Thickness: 3-5/8" for 4" walls and 6-1/2" for 6" walls, minimum. 10" thick between floors.

3. Facing: Unfaced.
4. Flame Spread: Less than 25, ASTM E84.
5. Smoke Developed Rating: Maximum 50.
6. Formaldehyde-free.

2.4 ACCESSORIES

- A. Fasteners, type and size to suit application.
- B. Tape: Acrylic with Polypropylene backing, Class A, flame spread less than 25, adhering type, 2-1/2 inch wide; No. 8086 CONTRACTOR SHEATHING TAPE, manufactured by 3m Company, St. Paul, MN, or equal as approved in accordance with Division 01, General Requirements for substitutions.
- C. Insulation Fasteners: Steel impale spindle and clinch shield on fiat metal base with applied adhesive, length to suit insulation thickness, capable of securely and rigidly fastening insulation in place; INSUL-ANCHORS, manufactured by Gemco, Dansville, OH, or equal as approved in accordance with Division 01, General Requirements for substitutions. Self-adhesive base plates are prohibited.
- D. Adhesive: Tuff Bond Hanger Adhesive manufactured by Gemco, Dansville, OH, or equal as approved in accordance with Division 01, General Requirements for Substitutions.
- E. String wire: Minimum 16 gauge galvanized annealed steel wire spaced at 18" on center.
- F. Do not use salvage cut-offs, materials less than space width, or in multiple short lengths to fill-in the gaps.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions.
- B. Verify that substrate and adjacent materials are satisfactorily installed and in place and are ready to receive insulation.

3.2 INSTALLATION

- A. Install insulation in accordance with insulation manufacturer's instructions.
 1. Clean tracks prior to installation.
- B. Install in cavities designated to receive sound thermal insulation without gaps or voids. Extend material full height of cavity.
- C. Cut insulation to fit tightly at cavities between studs not standard 16 inches on center spacing.

- D. Trim insulation neatly to fit spaces.
- E. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids.
- F. Extend thermal materials full height of cavity to structure above and as otherwise required to produce a completely insulated building envelope.
- G. Extend sound materials full height of cavity to structure above and as otherwise required to produce a completely sound insulated enclosure.
- H. Tape and seal [butt ends, lapped flanges, and] tears or cuts in foil in thermal batts.
- I. Friction fit semi-rigid sound insulation batts in cavities, no gaps voids permitted.
- J. Metal Framing: Place foil side of thermal batts toward inside of building. Place insulation fasteners at 36 inches on centers, vertically in two rows at each stud cavity. Tape and seal tears or cuts in foil.
 - 1. Batts Under Metal Roof Decks: Install foil-faced flanged-type insulation batts secured with spindle anchors. Staple flanges together at maximum 4" centers and seal joints at abutting vertical surfaces with a pressure-sensitive plastic tape. Provide 16 gauge galvanized string wires under batts wherever necessary to prevent sagging, stretched taut.
- K. Install material to preclude slipping from place by use of nails, screws, wires or other approved fastening devices.
- L. Where tight, congested, difficult or otherwise unforeseen conditions are encountered, employ alternate application methods or materials to affect the intended insulation system. Alternate methods or materials shall be submitted to Architect for review and approval.

3.3 INSPECTION

- A. Notify Project Inspector before Work is covered. Approval by Project Inspector shall be received before any Work is concealed. Work that has been covered prior to inspection and approval shall be uncovered for inspection and recovered.

END OF SECTION

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SECTION 07 92 00 – JOINT SEALANTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Preparing substrate surfaces.
- B. Sealant and joint backing.
- C. Related Section:
 - 1. Section 01 35 42, CALGreen Requirements

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. ASTM C834 - Latex Sealing Compounds.
- C. ASTM C881 - Epoxy-Resin Base Bonding Systems for Concrete.
- D. ASTM C919 - Use of Sealants in Acoustical Applications.
- E. ASTM C920 - Elastomeric Joint Sealants.
- F. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
- G. ASTM C1184 - Structural Silicone Sealant.
- H. ASTM C1193 - Standard Guide for Use of Joint Sealants.
- I. ASTM C1311 - Solvent Release Sealants. Butyl and acrylic base polymer.
- J. ASTM C1330 - Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
- K. ASTM C1635 Standard Test Method to Evaluate Adhesion/Cohesion Properties of a Sealant at Fixed Extensions
- L. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification (www.SWRIONLINE.org).
- M. GANA: Glass Association of North America Sealant Manual, 2008.
- N. California Green Building Standards Code, CALGreen - 2022.
- O. SCAQMD - South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications

1.3 SUBMITTALS

- A. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
- B. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen code per 1.04.E.

- C. Manufacturer's installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.
- D. Identify sealants within submittal same as identified in Part - 2 of the specification.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform acoustical sealant application work in accordance with ASTM C919.
- C. Prepare sample joints in the construction to demonstrate to the Architect the quality of the Work to be performed. Accepted sample joints will be used to judge the quality of the Work.
- D. Qualifications
 - 1. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum three years' experience.
 - 2. Applicator:
 - a. Pre-qualified applicator specializing in performing Work of this Section with minimum three years' experience and approved by manufacturer.
 - b. This applicator shall be licensed joint sealing specialty Contractor.
 - c. Submit list of completed local projects of similar sealant applications.
- E. California Green Building Standards Code, CALGreen - 2022.
 - 1. Adhesives, sealants, primers, and caulks shall comply with air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, per CALGreen Tables 5.504.4.1 and 5.504.4.2.
- F. Comply with Air Quality regulations, California Regulations:
 - 1. SCAQMD Rule 1168 compliant VOC limit of 250.

1.5 ENVIRONMENTAL REQUIREMENTS

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

1.6 COORDINATION

- A. Coordinate the Work with all Sections referencing this Section.

1.7 WARRANTY

- A. Provide five-year product warranty, submit under provisions of Division 01, General Requirements.
- B. Provide two-year installer's warranty, submit under provisions of Division 01, G General Requirements.
- C. Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal, water tight seal, exhibit loss of adhesion or cohesion, or do not cure.

- D. Upon written notification of failure due to defective materials or application, repair or replace failure to the approval of the Architect and at no cost to Owner.

PART 2 - PRODUCTS

2.1 SEALANT AND MATERIAL MANUFACTURERS

- A. Following is list of acceptable manufacturers of sealants and sealant materials. Inclusion in this list is not intended to imply that all manufacturers make all products. Products made by listed manufacturers must comply with all specified requirements.
1. Bostik Construction Products.
 2. Dow Corning Corporation (www.dowcorning.com/construction)
 3. Sika Corporation.
 4. General Electric Company.
 5. W.R. Meadows, Inc.
 6. Pecora Corporation.
 7. Mameco International.
 8. Tremco/Vulkem.
 9. Sonneborn, ChemRex Inc.
 10. Hilti
 11. 3M Company
- B. Substitutions: Under provisions of Division 01, General Requirements.

2.2 SEALANT TYPES

- A. Single-Component Urethane: ASTM C 920, Type S, Grade NS, Class 35, Use NT, A, M, and O; USDA and FDA status.
- B. Single-Component Urethane (Self-Leveling): ASTM C 920, Type S, Grade P, Class 35, Use T, A, M.
- C. Multi-Component Urethane (Gun-Grade): ASTM C 920, Type M, Grade NS, Class 35, Use NT, A, M, and O.
- D. Multi-Component Polyurethane (Gun-Grade): ASTM C 920, Type M, Grade NS, Class 35, Use T, A, M, and O.
- E. Multi-Component Urethane (Self-Leveling): ASTM C 920, Type M, Grade P, Class 25, Use T, A, M, and O.
- F. Single-component sealant, Silicone (Neutral-curing): ASTM C 920, Type S, Grade NS, Class 35, Use NT, G, A, M, and O; USDA, NSF and FDA 21 CFR 177.2600 approved.
- G. Single-component sealant, Silicone (Neutral-curing,): ASTM C 920, Type S, Class 100/50, Grade P, Use T, and O.

- H. Single-component, modified silicone polymer (silyl-terminated polyether resin - STPe), elastomeric sealant with plus-100-percent to minus-50-percent movement and complying with ASTM C-920, Type S, Grade NS, Uses NT, G, M, A, and O.
 - 1. Acceptable Product: BASF, Sonolastic 150 Tint Base, or equal. Color shall be as selected by the Architect from the manufacturer's full range of available colors.
- I. Acrylic-Latex Caulk: ASTM C 834, Type OP or C, Grade 18 deg. C.
- J. Bedding Compound: For installation of thresholds and similar items indicated to be bedded in sealant, use a preformed butyl-polyisobutylene sealant tape. Size of tape as required for the specific application.
- K. Adhesives: Type that complies with Mil. Spec. MIL-A-46146
 - 1. Product: Dow Corning 3145 Silicone Adhesive
 - 2. Color: Clear or Translucent.
 - 3. Peel Strength: 75
- L. Acoustical Sealant - gunnable type, non-drying, non-hardening permanently flexible, ASTM C919, ASTM C834, ASTM C920.
 - 1. Manufacturers: Tremco Acoustical Sealant, U.S. Gypsum Sheetrock Acoustical Sealant, Pecora Corp. BA-98 or equal.
- M. Butyl Sealants: Butyl rubber sealant, BC-158 by Pecora or equal in compliance with VOC regulations of local Air Quality Districts.

2.3 JOINT AND SURFACE TYPES

- A. Pedestrian and Vehicle Traffic Joints - Provide one of the following for each joint type:
 - 1. Multi-component urethane (self-leveling)
 - 2. Single-component urethane (self-leveling)
 - 3. Single-component sealant, silicone (neutral curing)
- B. Non-Traffic Deck Joints - Provide one of the following for each joint type:
 - 1. Multi-component urethane (gun-grade)
 - 2. Single-component urethane
 - 3. Single-component sealant, silicone
- C. Concrete Surfaces exceeding 20 square feet.
 - 1. Single-Component Silicone (Neutral-curing,): ASTM C 920 Class 25, Type S, Grade P, Use T, and O (self-leveling).
- D. Vertical Joints - Provide one of the following for each joint type:
 - 1. Multi-component urethane (gun-grade)
 - 2. Single-component sealant, silicone (neutral cure)

- E. Expansion, Control, and Perimeter Joints - Provide one of the following for each joint type:
 - 1. Multi-component urethane (self-leveling)
 - 2. Single-component urethane; use only where dynamic movement will not exceed 50 percent of joint width - above or below grade
 - 3. Single-component urethane (self-leveling)
 - 4. Single-component sealant, silicone.
- F. Curtainwalls, storefronts, entrances, and Related Assemblies - Provide one of the following for each joint type or installation at perimeter of aluminum-framed systems:
 - 1. Single-component silicone (neutral-curing)
 - 2. Non-Moving Joints, Interior and Exterior: Single-component sealant, silicone neutral cure),-ASTM C920.
- G. Water-Immersion Areas - Provide one of the following for each joint type, ASTM C920, Class 25, Use I, T, NT, M, and O.:
 - 1. Multi-component urethane (self-leveling)
 - 2. Single-component urethane (self-leveling)
 - 3. Multi-component polysulfide (self-leveling)
 - 4. Multi-component polysulfide (non-sag)
- H. Glazing - Provide one of the following for each joint type:
 - 1. Single-component sealant, silicone (neutral-curing).
 - 2. Structural silicone sealant for Structural Glazing.
- I. Acoustical Sealant - gunnable, provide the following:
 - 1. Non-drying, non-hardening, non-skinning sealant type, ASTM C919.
 - 2. Acrylic-latex caulk, Type OP opaque or Type C clear at visual locations, ASTM C834.
 - 3. Chemically curing Sealant, for interior sound reduction application, ASTM C920.
- J. Acoustical Putty Pads - QuietPutty 380 by Quiet Rock or equal.
 - 1. Thickness: 1/8"
 - 2. Width: 7"
 - 3. Length: 7"
 - 4. Surface Burning Characteristics: Class A
- K. Smoke and Acoustical Sealant: ASTM C834, Hilti CP 506 (openings), CP 572 (joints), STI SpecSeal "Smoke 'N' Sound Acoustical Spray".

- L. Toilet and Bath Areas: Sealant containing a fungicide for mildew resistance - Provide one of the following for each joint type:
 - 1. Single-component silicone (neutral-curing)
 - 2. Single-component silicone (acid cure)
- M. Exterior Doors and Windows: Sealant used for exterior joints or butyl rubber.
- N. Interior Doors and Windows - Provide one of the following for each joint type:
 - 1. Single-component sealant, silicone (neutral cure)
- O. Built-In Cabinet Work: In kitchen, toilet, and bath areas, as specified for those areas. In other areas, single-component silicone (neutral-curing) or acrylic-latex caulk.
- P. Miscellaneous locations: Butyl rubber at all gaps, holes, openings, under wood sills, penetrations or channel metal track in exterior envelope of building not identified herein. Install as directed by the Architect.

2.4 SEALANT COLORS

- A. Provide materials matching colors indicated or if no color is indicated, matching the color samples selected from those submitted to the Architect.
 - 1. Sealant between walls and door, window, and louver frames to match adjacent wall color.

2.5 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing Rod: ASTM C1330 Class C, closed cell polyethylene cylindrical backer rod; oversized 30 to 50 percent larger than joint width, Green Rod by Nomaco Inc., Zebulon, NC, Backer Rod Mfg. Denver, CO or equal.
- D. Elastomeric Tubing Sealant Backing: ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
- E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- F. Filler: Mineral fiber board; ASTM C612, Class I, thickness same as joint, depth to fill void completely behind backer-up rod.
- G. Tape Sealants; pressure sensitive, 100% solid, sealing tape with a release paper backing. Provide permanent elastic, non-sagging, non-toxic, non-staining tape sealant. Schnee-Morehead Inc. "Tacky Tape" SM5227, 3/32" or 1/2" wide x 3/8" thick x 45' long, or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces and joint openings are ready to receive Work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

- A. Remove loose materials and foreign matter which might impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions.
- D. Protect elements surrounding the Work of this Section from damage or disfiguration.
- E. At deep joints install filler material to fill space behind the back-up rod and position the rod at proper depth.

3.3 INSTALLATION

- A. Do not proceed with sealant Work until the sample joints specified in Part 1 of this Section have been prepared and accepted by the Architect.
- B. Install sealant in accordance with manufacturer's instructions and ASTM C1193.
- C. Apply sealant per ASTM C919 at gypsum board framed sound walls, side of runners in metal framing and miscellaneous openings and cutouts.
- D. Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios.
- E. Install joint backing to achieve a neck dimension no greater than 1 /3 of the joint width.
- F. Install bond breaker where joint backing is not used.
- G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- H. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- I. Tool joints concave unless detailed otherwise.

3.4 CLEANING

- A. Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

- A. Protect finished installation under provisions of Division 01, General Requirements.
- B. Protect sealants until cured.

END OF SECTION

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SECTION 08 12 13 - HOLLOW METAL FRAMES - WELDED

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Non-rated and Fire-rated Welded steel frames for doors.
- B. Related Sections
 - 1. Section 06 20 00, Finish Carpentry – Installation of Doors

1.2 REFERENCE STANDARDS

- A. Conform to reference standards by date of issue current on date of Contract Documents.
- B. SDI - Steel Door Institute.
 - 1. SDI 100 - Recommended Specifications for Standard Steel Doors and Frames, Latest Edition.
 - 2. SDI 111 - Recommended Standard Details Steel Doors and Frames.
 - 3. SDI 117 - Manufacturing Tolerances Standard Steel Doors and Frames.
 - 4. SDI 118 - Basic Fire Door Requirements.
- C. ANSI - American National Standards Institute
 - 1. ANSI A250.4 and A450.5 - Test Procedure / Acceptance Criteria for Physical Conformance.
 - 2. ANSI A250.6- Hardware on Steel Doors (Reinforcement Applications).
 - 3. ANSI A250.8/SDI-100 - Recommended Specifications for Standard Steel Doors and Frames, Latest Edition.
 - 4. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Steel Surfaces for Steel Doors and Frames.
 - 5. ANSI A250.11/SDI-105 - Recommended Erection Instructions for Steel Frames.
- D. ASTM - American Society for Testing and Materials
 - 1. ASTM A653 - Sheet Steel, Zinc-Coated (Galvanized) or Zinc - Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A924 - General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - 3. ASTM A1008 - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 4. ASTM D6386 - Preparation of Hot-Dipped Galvanized Coated Iron and Steel and Hardware Surfaces for Painting.
- E. ADA - Americans with Disabilities Act of 1990, as amended.

1. ADA Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.
- F. CBC - 2022 California Building Code.
- G. CRSC - California Referenced Standards Code (CCR Title 24, Part 12)
 1. CRSC-7A.4 - Standard 12-7A-4 Fire Resistive Standards, Fire Door Assemble Tests
 2. CRSC-10.2 - Standard 12-10-2 Single Point Latching or Locking Devices
 3. CRSC-10.3 - Standard 12-10-3 Emergency Exit and Panic Hardware
- H. NFPA - National Fire Protection Association
 1. NFPA 80 - Fire Doors and Windows
- I. UL - Underwriters Laboratories, Inc.
 1. UL-1 OB - Fire Test of Door Assemblies
 2. UL 10C - Positive Pressure Fire Tests of Door Assemblies
- J. Standard 12-7-4 Fire Resistive Standards, Fire Door Test Assembly Tests - California Referenced Standards Code, CCR Title 24, Part 12.
- K. AWS - American Welding Society
 1. AWS A2.4 - Standard Symbols for Welding, Brazing and Non Destructive Examination
 2. AWS A5.1 - Carbon Steel Electrodes for Shielded Metal Arc-Welding
 3. AWS A5.5 - Low Alloy Steel Electrodes for Shielded Metal Arc-Welding
 4. AWS B2.1 - Welding Procedure and Performance Qualification
 5. AWS D1.1 - Structural Welding Code, Steel
 6. AWS D1.3 - Structural Welding Code, Sheet Steel

1.3 SUBMITTALS

- A. Shop drawings indicating frame configuration, anchor types and spacing, location of cutouts for hardware, reinforcement, and finish.
- B. Product data.
- C. Manufacturer's installation instructions.
- D. Job Closeout: provide one complete manufacturer's catalog to Owner's lock shop or Authorized Representative.

1.4 QUALITY ASSURANCE

- A. Manufacture frames to conform to SDI standards except where exceeded by this Specification.

- B. Comply with ANSI/SDI A250.4 Level A, one million cycle swing test performance for 3070 door frames.
- C. Manufacturer: Company specializing in manufacturing products specified in this Section having minimum five (5) years experience.
- D. Installer: Firm with minimum five (5) years experience in installation of metal doors and frames.

1.5 DELIVERY, STORAGE AND PROTECTION

- A. Deliver and protect frames with manufacturer's shipping safeguards.
- B. Attach spreader bars on welded frames to preclude warping or bending during delivery and storage.
- C. Storage: Store in dry secure location. Place units on minimum 4 inch high wood blocking. Avoid non-vented plastic or canvas shelters. Provide 1/4 inch wide spaces between stacked units.

1.6 WARRANTY

- A. One-year warranty against defects in materials and workmanship. Warranty to commence at Date of Certified Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of following manufacturers form basis for design and quality intended.
 - 1. Ceco Door, Milan, TN.
 - 2. Curries Company, Mason City, IA.
 - 3. Door Components, Inc., Fontana, CA.
 - 4. Mesker Doors, Huntsville, AL.
 - 5. Republic Doors and Frames, McKenzie, TN.
 - 6. SteelCraft, an Allegion Brand, Dublin, Ireland.
- B. Or equal in accordance with Division 01, General Requirements for Substitutions.

2.2 WELDED FRAMES

- A. Type: ANSI A250.8/SDI-100, Level 1 Standard Duty frames, with integral stop and flat trim, double rabbet, profiles as indicated on Drawings, cold rolled steel, Commercial Steel, ASTM A1008, galvanized steel ASTM A653 and ASTM A924 for exterior applications. Minimum: 16 gauge.
 - 1. Drywall: Provide backbend returns.
 - 2. Piaster: Keyed-in-frame backbends.

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HOLLOW METAL FRAMES - WELDED

- B. Anchors: Provide two anchors at head for openings up to 48 inches, three if wider, maximum 30 inches on centers. Provide three at jamb for doors up to 84 inches in height, additional anchors at maximum 30 inches on centers for higher doors.
 - 1. Provide appropriate type of anchors consistent with type of wall construction for each installation and in conformance with SDI 111 and ANSI 250.11.
 - 2. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c.
 - 3. Masonry Type: 16 gauge T-shaped anchors to suit frame size, not less than 16 gauge thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; minimum 3 per jamb.
- C. Floor Attachment: Provide adjustable base anchor with extension for expansion anchor attachment to concrete floor. Extension factory welded. Minimum thickness: 14 gauge.
 - 1. Wedge Type: KWIK Bolt TZ2, 3/8 to 3/4 inch diameter, ICC ESR-4266, by Hilti Inc., Tulsa, OK. Refer to Section 01 40 00.
 - 2. Monolithic Concrete Slabs: Clip-type anchors, with holes to receive fasteners.
- D. Hardware Attachment: Mortise, reinforce, drill and tap at factory to receive specified hardware. Install minimum 10 gauge reinforcing welded to frame for surface mounted hardware, except install 7 gauge reinforcing for hinges. Tap to templates.
 - 1. Install reinforcing for closers, both sides of frames, on all frames, single and pairs, labeled and non-labeled.
 - 2. Use 10 Gauge reinforcing for locks, panics, closers, and hold-open arms.
- E. Silencers: Make provision for minimum three rubber silencers at strike jamb of all doors except fire-rated doors, and one at head of each leaf of double doors, except fire-rated doors.
- F. Fire-Rated Frames:
 - 1. Construct as tested and rated in accordance with SDI 118.
 - 2. Conform to Standard 12-7-4 Fire Resistive Standards, Fire Door Test Assembly Tests - California Referenced Standards Code, CCR Title 24, Part 12 and NFPA 80.
 - 3. Attach UL or WH label to frame.
 - 4. Solid grout frames abutting against masonry and concrete walls.
 - 5. Refer to drawings for rating requirements.

2.3 PROTECTIVE COATINGS

- A. Interior Frames:

1. Metallic coating protection not required.
 2. Pretreat and shop prime, air-dried, conforming to ANSI A250.10
 3. Prime and paint frames under Section 09 90 00 Painting, colors as indicated on drawings.
- B. Exterior Frames:
1. Metallic coating protection required: ASTM A653, zinc type G60 Grade designation.
 2. Pretreat and shop prime, air-dried, conforming to ANSI A250.10.
 3. Prime and paint frames under Section 09 90 00, colors as indicated on drawings.
 4. Wipe coat galvanized steel is not permitted.
- C. On surfaces where metallic coating has been damaged or removed during fabrication, frames shall be touched-up with factory-applied primer.

2.4 FABRICATION

- A. Fabricate exterior welded steel door frames machine-mitered and full welded (Continuously Welded) unit type. Weld and grind smooth. No intermittent welds or plate splices permitted at intersections.
- B. Fabricate interior welded steel door frames as machine-mitered face-welded unit type. Weld and grind smooth.
- C. Where cross mullions or T intersections occur, frames shall be fabricated as butted and face-welded assembly joints. At mullion-to-base intersections extend mullion to floor and face weld. Where butted joints are exposed to weather, seal intersection as specified in Section 07 92 00.
- D. Machine mitered faces and butt-joined integral stops permitted with continuous welds.
- E. Fabricate frames with hardware reinforcement plates welded in place.
- F. Fabricate frames to accept anchors as described in SDI-111 for type of wall construction.
- G. Reinforce frames for door closers on both sides of frames.
- H. Apply primer to all surfaces of frames, in accordance with requirements of ANSI A250.10. Metallic-coated protected surfaces shall be pretreated prior to application of primer.
- I. Attach fire-rated label to each fire-rated door frame.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install frames in accordance with ANSI A250.11/SDI-105.
1. Installation of jamb anchors to steel framing: weld to studs.

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HOLLOW METAL FRAMES - WELDED

- 2. Install Floor anchors, 1 clip angle per jamb with expansion wedge type anchor.
- 3. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
- B. Fire doors frames shall be installed in accordance with their listing, Standard 12-7-4 Fire Resistive Standards, Fire Door Assembly Tests - California Referenced Standards Code, CCR Title 24, Part 12, and NFPA No. 80, and the manufacturer's instructions.
- C. Install insulation behind frames, unless noted otherwise.
- D. Coordinate anchor placement with type of wall construction.
- E. Prime and Paint frames under Section 09 90 00, Painting, colors as indicated on drawings.

3.2 TOLERANCES

- A. Conform to standard of tolerances as required in SDI-117.

END OF SECTION

SECTION 08 13 13 - HOLLOW METAL DOORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Non-rated and Fire-rated rolled-steel doors.
- B. Glass stops.
- C. Related Sections:
 - 1. Section 06 20 00, Finish Carpentry - Installation of Doors.

1.2 REFERENCE STANDARDS

- A. Conform to reference standards by date of issue current on date of Contract Documents.
- B. ADA - Americans with Disabilities Act of 1990, as amended.
 - 1. ADA Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.
- C. SDI - Steel Door Institute.
 - 1. SDI 100 - Recommended Specifications for Standard Steel Doors and Frames, Latest Edition.
 - 2. SDI 118 - Basic Fire Door Requirements.
 - 3. SDI 111 - Standard Details Steel Doors and Frames .
 - 4. SDI 117 - Manufacturing Tolerances Standard Steel Doors and Frames.
- D. ANSI - American National Standards Institute
 - 1. ANSI A250.4 - Test Procedures and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings.
 - 2. ANSI A250.5 - Accelerated Physical Endurance Test Procedure for Steel Doors, Frames, and Frame Anchors.
 - 3. ANSI A250.8/SDI 100 - Recommended Specifications for Standard Steel Doors and Frames.
 - 4. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
 - 5. ANSI A250.11/105 - Recommended Erection Instructions for Steel Frames.
- E. ASTM - American Society for Testing and Materials
 - 1. ASTM A653 - Standard Specification for Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

2. ASTM A924 - General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
3. ASTM A1008 - Standard Specifications for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
4. ASTM A568 - General Requirements for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
- F. CBC – 2022 California Building Code
 1. CBC-10 - CBC Chapter 10, Means of Egress
 2. CBC-11 - CBC Chapter 11B, Accessibility to Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing
- G. CRSC - California Referenced Standards Code (CCR Title 24, Part 12)
 1. CRSC-7A.4 - Standard 12-7-4 Fire Resistive Standards, Fire Door Assemble Tests
 2. CRSC-7A.2 - Standard 12-7A-2, Exterior Windows
 3. CRSC-10.2 - Standard 12-10-2 Single Point Latching or Locking Devices
 4. CRSC-10.3 - Standard 12-10-3 Emergency Exit and Panic Hardware
- H. NFPA - National Fire Protection Association
 1. NFPA 80 - Fire Doors and Windows
 2. NFPA 105 - Installation of Smoke Door Assemblies
 3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies
- I. UL - Underwriters Laboratories, Inc.
 1. UL 10C - Positive Pressure Fire Tests of Door Assemblies
 2. UL 1784 - Air Leakage Test for Door Assemblies
- J. ITS-WH - Intertek Testing Services-Warnock-Hersey.

1.3 SUBMITTALS

- A. Shop drawings indicating core material, location of cutouts for hardware, reinforcement and finish.
- B. Product data.
- C. Manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- A. Manufacture doors to conform to SDI standards except where exceeded by this Specification.

- B. Comply with ANSI/SDI A250.4 Test Procedure and Acceptance Criteria for - Physical Endurance for Steel Doors and Hardware Reinforcings. Level A, one million cycle swing test performance.
- C. ADA-The Americans with Disabilities Act - Title II-Uniform Federal Accessibility Standards.

1.5 DELIVERY, STORAGE AND PROTECTION

- A. Deliver and protect doors with manufacturer's shipping safeguards.
- B. Storage: Store in dry secure location. Place units on minimum 4-inch high wood blocking. Avoid non-vented plastic or canvas shelters. Provide 1 /4-inch wide spaces between stacked doors.

1.6 WARRANTY

- A. One-year warranty against defects in materials and workmanship. Warranty to commence at Date of Certified Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of following manufacturers form the basis for design and quality intended.
 - 1. Ceco Door, Milan, TN.
 - 2. Curries Company, Mason City, IA.
 - 3. Door Components, Inc., Fontana, CA.
 - 4. Mesker Doors, Huntsville, AL.
 - 5. Republic Doors and Frames, McKenzie, TN.
 - 6. SteelCraft, an Allegion Brand, Dublin, Ireland.
- B. Or equal in accordance with Division 01, General Requirements for Substitutions.

2.2 DOORS

- A. Exterior Doors: ANSI A250.8/SDI-100, Level 3, Extra Heavy-Duty and Physical Performance Level A, 1-3/4 inches thick, Model 2 Seamless, 16 gauge cold-rolled face sheets, ASTM A653/A-653M, Seamless, continuously welded seam dressed smooth, hollow-steel construction, sizes as scheduled on drawings.

Close top and bottom with flush end closures make top closures watertight. Beveled edge profile.
- B. Interior Doors: ANSI A250.8/SDI-100, Level 2, Heavy-Duty, Physical Performance Level B, 1-3/4 inches thick, Model 2 Seamless, 18 gauge cold-rolled face sheets, ASTM A1008, seamless continuously welded seam dressed smooth, hollow-steel construction, Close top and bottom with flush end closure, beveled edge profile, sizes as scheduled on drawings, prime coated only.

- C. End Closures: Minimum 18 gauge.
- D. Fire Rated Doors Assembly: Test in accordance with NFPA 252. CRSC California Referenced Standards Code, Standard 12-7-4, Fire Door Assembly Tests.
- E. Fire Rated Doors: Label "S" for smoke assembly requirements, NFPA 80, NFPA 105.

2.3 DOOR CORE

- A. Performance Test Procedures Requirements: Conform to ANSI A250.4
- B. Core for non-fire-rated doors:
 - 1. Core for exterior doors:
 - a. Thermal-Rated (Insulated) doors: minimum polystyrene 1 lb/cu ft. density of U-factor 0.21 minimum and R-Factor of 5 minimum, full thickness of cavities.
 - 2. Core for interior doors:
 - a. Rigid polystyrene foam board 1 lb/cu.ft. minimum density. Compressive strength 1750 psf and shear strength minimum 18 psi.
 - 3. Core construction shall conform to requirements of the grade of door specified in accordance with ANSI A250.8/SDI-100, Sections 2.3.2 and 1.4.
- C. Core for Fire-Rated Doors: mineral core 16-20 lb. density (incombustible); Conform to Door Schedule for fire rating required.
- D. Frames for Fire-Rated Doors: Conform to CRSC California Referenced Standards Code, Standard 12-7-4, fire door tests, Label "S" for smoke assembly requirements NFPA 105 and Section 08 12 13.

2.4 ACCESSORIES

- A. Glass Stop: Unit frame, model FGS-75 manufactured by Anemostat Products Division, Carson, CA, or an approved equal, for fire-rated and non-fire rated doors.
 - 1. Frame: 18 gauge.
 - 2. Finish: Factory primed. Field painted under Section 09 90 00.
 - 3. Unit shall have UL or WH label and State Fire Marshal approval number.
 - 4. Fire Rated Glass: As specified in Section 08 80 00. Refer to CBC Chapters 7 Section 716.5.7, and 716.6.
 - a. TGP FireLite NT: 3/16" thick: Fire-rated Glass-Ceramic Glazing, per Section 08 80 00, not to exceed 1296 square inches per unit for 45 minutes or 100 sq. in. for 60 min. Install with UL Listed glazing tape.
 - b. Wire glass: maximum rating; 20 minutes and 45 minutes, 1296 square inches maximum. For 60 and 90 minutes door frames, 100 square inches maximum.

5. Mounting: Countersunk, one-way vandal-resistant heads, through-bolts <or one side mounting sheet metal screws from inside>.
6. Exterior Doors: Unit shall be hot-dip galvanized after fabrication.
7. GL-2 Safety Glass: ASTM C1048, Kind FT Fully tempered, as specified in section 08 80 00.
8. GL-1 Insulating Glass Units, Low-E Coated, as specified in section 08 80 00.

2.5 PROTECTIVE COATINGS

- A. Interior Doors:
 1. Metallic-coating protection not required.
 2. Pre-treat and shop prime with modified alkyd, air-dried, conforming to ANSI A250.10.
- B. Exterior Doors:
 1. Metallic coating protection required, types permitted: ASTM A653/A-653M, hot-dip galvanized, zinc-coated Commercial Steel, G60 Grade coating designation
 2. Pre-treat and shop prime with modified alkyd, air-dried, conforming to ANSI A250.10.
 3. Prime and paint doors under Section 09 90 00, colors as indicated on drawings.
- C. On surfaces where zinc has been damaged or removed during fabrication, doors shall be touched-up with factory-applied primer.

2.6 FABRICATION

- A. Fabricate doors from cold-rolled steel conforming to ASTM A1008/A1008M or ASTM A924. Stretcher-leveled standard of flatness for face sheets.
- B. Manufacturing tolerances per SDI 117 - Manufacturing Tolerances Standard Steel Doors and Frames,
- C. Fabricate doors with cutouts sized for hardware and openings as indicated. Non-handed doors using hinge fillers are not permitted.
- D. Reinforce, drill and tap doors to receive mortise hinges, locks, latches, flush bolts and closer. Use reinforcing gauges as listed in Table 4 of ANSI A250.8/SDI-100. Channel or plate reinforcing only.
- E. Locate hardware according to Table 5, ANSI A250.8/SDI-100, CBC 11 B-404.2.7.
- F. Apply primer to all surfaces of doors in accordance with requirements of ANSI A250.10. Metallic-coated surfaces shall be pre-treated prior to application of primer.
- G. Attach fire-rated label to hinge-stile of each fire-rated door unit and frames.

- H. Hardware Enclosures: Provide enclosures and junction boxes within doors for electrically operated door hardware, interconnected with UL-approved, 1/2-inch-diameter conduit and connectors. Delete subparagraph below if not required. Where indicated for installation of wiring, provide access plates to junction boxes, fabricated from same material and thickness as face sheet and fastened with at least 4 security fasteners spaced not more than 6 inches on centers.

PART 3 - EXECUTION

3.1 INSTALLATION OF HOLLOW METAL DOORS

- A. Install doors in accordance with SDI ANSI A250.11/105 and SDI 122 recommendations.
- B. Install doors under Section 06 20 00 Finish Carpentry - Installation of Doors.
- C. Coordinate installation of glass or louvers where indicated.
3.02 ADJUSTING AND CLEANING
 - A. Adjust for smooth and balanced door movement.
 - B. Prime and Paint doors under Section 09 90 00, colors as indicated on Drawings.
 - C. On surfaces where zinc has been damaged or removed during fabrication, doors shall be touched-up with factory-applied primer.

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- F. Apply primer to all surfaces of doors in accordance with requirements of ANSI A250.10. Metallic-coated surfaces shall be pre-treated prior to application of primer.
- G. Attach fire-rated label to hinge-stile of each fire-rated door unit and frames.
- H. Hardware Enclosures: Provide enclosures and junction boxes within doors for electrically operated door hardware, interconnected with UL-approved, 1/2-inch-diameter conduit and connectors. Delete subparagraph below if not required.

**SECTION 08 13 13
HOLLOW METAL DOORS**

Where indicated for installation of wiring, provide access plates to junction boxes, fabricated from same material and thickness as face sheet and fastened with at least 4 security fasteners spaced not more than 6 inches on centers.

PART 3 - EXECUTION

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- A. Install doors in accordance with SDI ANSI A250.11/105 and SDI 122 recommendations.
- B. Install doors under Section 06 20 00 Finish Carpentry - Installation of Doors.
- C. Coordinate installation of glass or louvers where indicated.

3.2 ADJUSTING AND CLEANING

- A. Adjust for smooth and balanced door movement.
- B. Prime and Paint doors under Section 09 90 00, colors as indicated on Drawings.

END OF SECTION

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SECTION 08 31 00 – ACCESS DOORS AND PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Wall and ceiling access door and frame units.

1.2 RELATED REQUIREMENTS

- A. Section 09 29 00 - Gypsum Board Assemblies
- B. Section 09 90 00 - Painting
- C. Divisions 22, 23, 26, 27, and 28: Mechanical and Electrical components requiring access.
 - 1. Access doors in ductwork.

1.3 REFERENCE STANDARDS

- A. ITS (DIR) - Directory of Listed Products; current edition.
- B. UL (FRD) - Fire Resistance Directory; current edition.

1.4 SUBMITTALS

- A. See Section 01 33 00 – Submittal Procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
 - 1. If other than specified products by specified manufacturer, submit product data for each type of access door to be used. Include schedule of access door types, sizes and locations.
- C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
 - 1. For access doors other than shown on Drawings, submit marked floor plan giving locations of all access doors. Submit shop drawing for Architect's review before laying out utility services which require access doors.
- D. Manufacturer's Installation Instructions: Indicate installation requirements.
- E. Project Record Documents: Record actual locations of each access unit.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.6 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain access doors for entire project from one source from a single manufacturer.

- B. Regulation Requirements: Fire rated access doors shall conform to California Building Code (CBC) Title 24, Part 2, Chapter 7. Panels shall bear the label of Underwriters Laboratories or other testing agency acceptable to the State Fire Marshal.
- C. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access door assembly for rating shown, with flush door, frame, hinge, and latch from manufacturer listed in UL - Building Materials Directory. Provide UL label on each fire-rated access door.
- D. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.
- E. Coordination: Furnish inserts and anchoring devices for building into adjoining Work for installation of access doors.

1.7 PROJECT CONDITIONS

- A. Verification: Obtain specific locations and sizes for required access doors for Work specified in Plumbing, Mechanical, Electrical or other Sections, for access to concealed equipment, and indicate on submitted schedule.
- B. Special-Size Access Doors: Sizes up to 20-inches by 30-inches used where necessary or as indicated. Indicate special size access doors on submitted schedule.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND PANELS

- A. Access Door Materials and Fabrication, General: Provide each access door assembly manufactured as an integral unit, complete with all parts, and ready for installation.
 - 1. If size is not indicated, provide size as directed to adequately access concealed operable mechanisms.
- B. Units in Fire Rated Assemblies: Fire rating equivalent to the fire rated assembly in which they are to be installed.
 - 1. Provide products listed and labeled by UL or ITS (Warnock Hersey) as suitable for the purpose specified and indicated.

2.2 ACCESS DOORS AND PANELS ASSEMBLIES

- A. Wall-Mounted Units:
 - 1. Location: As indicated on drawings.
 - 2. Material: Steel.
 - 3. Size: 12 inch by 12 inch.
 - 4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
 - 6. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.

- B. Wall-Mounted Units in Wet Areas:
 - 1. Material: Steel, hot-dipped zinc, or zinc-aluminum-alloy coated.
 - 2. Size: 12 inch by 12 inch.
 - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 4. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
 - 5. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
- C. Fire-Rated Wall-Mounted Units:
 - 1. Wall Fire-Rating: As indicated on drawings.
 - 2. Material: Steel.
 - 3. Size: 12 inch by 12 inch.
 - 4. Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.
- D. Ceiling-Mounted Units:
 - 1. Material: Steel.
 - 2. Size - Other Ceilings: 12 inch by 12 inch.
 - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

2.3 WALL AND CEILING MOUNTED UNITS

- A. Manufacturers:
 - 1. ACUDOR Products Inc: www.acudor.com/#sle.
 - 2. Babcock-Davis: www.babcockdavis.com.
 - 3. Cendrex, Inc: www.cendrex.com/#sle.
 - 4. JL Industries Division of Activar, Inc.: www.activarcpg.com/jl-industries.
 - 5. Larsen's Manufacturing Co.: www.larsensmfg.com.
 - 6. Karp Associates, Inc: www.karpinc.com.
 - 7. Milcor, Inc: www.milcorinc.com.
 - 8. Nystrom, Inc: www.nystrom.com.
 - 9. Substitutions: See Division 01 - Product Options and Substitutions.
- B. Wall and Ceiling Mounted Units: Factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.

1. Style: As indicated on drawings.
 2. Door Style: Single thickness with rolled or turned in edges.
 3. Frames: 16 gage, 0.0598 inch, minimum thickness.
 - a. Exposed flange: Nominal 1-inch wide around perimeter of frame. Provide flange at flush-mounted (surface) access doors.
 - b. For installation at gypsum drywall or gypsum veneer plaster finishes: Provide perforated frames with drywall bead.
 - c. For installation in concrete or masonry construction: Provide frames with adjustable metal masonry anchors.
 - d. For installation at full-bed plaster finishes: Provide frames with galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.
 4. Heavy Duty Frames: 14 gage, 0.0747 inch, minimum thickness.
 5. Heavy Duty Single Steel Sheet Door Panels: 14 gage, 0.0747 inch, minimum thickness.
 6. Insulation: Non-combustible mineral wool or glass fiber.
- C. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
1. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
 2. Provide certificate of compliance from authorities having jurisdiction indicating approval of fire rated doors.
 3. Steel Finish: Primed.
 4. Primed and Factory Finish: Polyester powder coat; color as selected by Architect from manufacturer's standard colors.
 5. Door/Panel Size: As indicated on the drawings.
 6. Hardware:
 - a. Hardware for Fire-Rated Units: As required for listing.
 - b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
 - c. Latch/Lock: Screw driver slot for quarter turn cam latch.
 - d. Gasketing: Extruded neoprene, around perimeter of door panel.
- D. Provide recess-mounted doors for concealed installation in:
1. Acoustic tile ceiling systems, where indicated.
 2. Acoustical tile-finished gypsum board ceilings, where indicated.
 3. Gypsum board walls, where indicated.
 4. Ceramic tile walls, where indicated.
- E. Provide recess-mounted doors and frames with expanded metal lath for concealed installation in plaster.

2.4 ACCESSORIES

- A. Furnish attachment devices and fasteners of type required to secure access doors to types of support shown.
- B. Locks:
 - 1. Non-Rated Access Doors: By Manufacturer, type where indicated
 - a. Cam-action latch with special square-shanked key.
 - 2. Fire-Rated Access Doors: By Manufacturer, type where indicated.
 - a. Flush key device for self-latching bolt-type latch.
 - 3. Key all locks alike, unless otherwise scheduled.
 - 4. Where shown or scheduled, provide one cylinder lock per access door.
 - 5. For recess-mounted access doors, provide access sleeves for each locking device.
 - 6. Provide plastic grommets for installation in holes cut through finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.3 INSTALLATION

- A. Install units in accordance with manufacturer's instructions, in compliance with requirements of listing authority..
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Provide for correct termination of adjoining finish materials.
- D. Position units to provide convenient access to concealed equipment when necessary.

3.4 ADJUST AND CLEAN

- A. Adjust access doors and hardware after installation for proper and smooth operation.
- B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.
- C. Remove protective coverings and clean stainless steel access doors during cleaning for Substantial Completion Review.

3.5 SCHEDULES

- A. Access Door Locations:
 - 1. Provide access doors where indicated on Architectural, Mechanical, Plumbing and Electrical Drawings.
 - 2. Access doors indicated and required for Mechanical, Plumbing and Electrical Work shall be of a type matching those specified in this Section.
 - 3. Provide access doors as required to service building systems and as required by governing authorities, although not shown on Drawings.
 - a. Provide at smoke or fire detector in attic spaces. Size to allow for access and testing.
 - 4. Locate access doors, where practical, in building service areas and not in public or guest view.
 - 5. Submit proposed locations for access doors, not indicated on Drawings, to Architect for review prior to rough-in.
- B. Non-Fire Rated Door and Frame Units in Walls:
 - 1. In Gypsum Board on Studs:
 - a. For service and utility locations, primer paint finish, Model DSC-214M manufactured by Karp.
 - b. For food service, toilet and damp locations, stainless steel, Model DSC-214M manufactured by Karp.
 - c. For Administration, Multi-Purpose and similar areas accessible by general public, recessed face for field-applied and finished plaster on door face, Model RDW manufactured by Karp.
 - d. For toilets and locations accessible by general public with ceramic tile wall finish, flush-mounted with face of tile, stainless steel, Model DSB-214M manufactured by Karp.
- C. Non-Fire Rated Door and Frame Units in Ceilings:
 - 1. In Gypsum Board on Metal Furring:
 - a. For service and utility locations, primer paint finish, Model DSC-214M manufactured by Karp.
 - b. For food service, toilet and damp locations, stainless steel, Model DSC-214M manufactured by Karp.
 - c. For Administration, Multi-Purpose and similar areas accessible by general public, recessed face for field-applied and finished plaster on door face, Model RDW manufactured by Karp.
- D. Fire-Rated Access Doors: Access doors in time-rated fire-resistive walls, partitions and ceilings shall carry same rating as the wall, partition or ceiling.
- E. Fire Rated Door and Frame Units in Walls:
 - 1. In Gypsum Board on Studs:

- a. 1-1/2 hour B label fire rating.
 - b. For public areas, service and utility locations, primer paint finish, surface mounted, filled with 2-inch thick fire-rated insulation, with automatic closer, self-latching bolt-type latch, Model KPR-150FR manufactured by Karp.
 - c. For Food Service, Toilet and other damp locations with ceramic tile finish, stainless steel finish, surface mounted, filled with 2-inch thick fire-rated insulation, with automatic closer, self-latching bolt-type latch, Model KPR-150FR manufactured by Karp.
- F. Fire Rated Door and Frame Units in Ceilings:
- 1. In Gypsum Board on Metal Furring:
 - a. For typical dry locations, surface mounted, primer paint finish, filled with 2-inch thick fire-rated insulation, with automatic closer, self-latching bolt-type latch, Model KRP-150FR manufactured by Karp.
 - b. For Food Service, Toilet and other damp locations, stainless steel finish, surface mounted, filled with 2-inch thick fire-rated insulation, with automatic closer, self-latching bolt-type latch, Model KPR-150FR manufactured by Karp.

END OF SECTION

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SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Door hardware, including electric hardware.
 - 2. Gate Hardware.
- B. Related Divisions:
 - 1. Division 07 – sealant at exterior thresholds
 - 2. Division 08 – door hardware installation
 - 3. Division 08 – metal doors and frames, interior aluminum frames, wood doors, door hardware installation, integrated security systems, specialty doors, storefront and glazed curtainwall systems.
 - 4. Division 10 – operable partitions
 - 5. Division 28 – security access systems
- D. Omissions: Hardware for the following is specified or indicated elsewhere.
 - 1. Windows.
 - 2. Cabinets, including open wall shelving and locks.
 - 3. Signs, except where scheduled.
 - 4. Toilet accessories, including grab bars.
 - 5. Installation.
 - 6. Rough hardware.
 - 7. Conduit, junction boxes & wiring.
 - 8. Folding partitions, except cylinders where detailed.
 - 9. Sliding aluminum doors, except cylinders where detailed.
 - 10. Access doors and panels, except cylinders where detailed.
 - 11. Corner Guards.
 - 12. Welded steel gates and supports.

1.2 REFERENCES

- A. Use date of standard in effect as of Bid date.

1. American National Standards Institute
 - a) ANSI 156.18 – Materials and Finishes.
 2. BHMA – Builders Hardware Manufacturers Association
 3. 2022 California Building Code
 - a) Chapter 11B – Accessibility To Public Buildings, Public Accommodations, Commercial Buildings and Public Housing
 4. DHI – Door and Hardware Institute.
 5. NFPA – National Fire Protection Association
 - a) NFPA 80 2019 Edition – Standard for Fire Doors and Other Opening Protectives.
 - b) NFPA 105 – Smoke and Draft Control Door Assemblies
 - c) NFPA 252 – Fire Tests of Door Assemblies
 6. UL – Underwriters Laboratories
 - a) UL10C – Positive Pressure Fire Tests of Door Assemblies.
 - b) UL 305 – Panic Hardware
 7. WHI – Warnock Hersey Incorporated State of California Building Code
 8. Local applicable codes
 9. SDI – Steel Door Institute
 10. WI – Woodwork Institute
 11. AWI – Architectural Woodwork Institute
 12. NAAMM – National Association of Architectural Metal Manufacturers
- B. Abbreviations
1. Manufacturers: see table at 2.1.A of this section
 2. Finishes: see 2.7 of this section.

1.3 SUBMITTALS & SUBSTITUTIONS

- A. SUBMITTALS: Submit six copies of schedule per D. Only submittals printed one sided will be accepted and reviewed. Organize vertically formatted schedule into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Minimum 10pt font size. Include following information:
1. Type, style, function, size, quantity and finish of hardware items.
 2. Use BHMA Finish codes per ANSI A156.18.
 3. Name, part number and manufacturer of each item.
 4. Fastenings and other pertinent information.

5. Location of hardware set coordinated with floor plans and door schedule.
 6. Explanation of abbreviations, symbols, and codes contained in schedule.
 7. Mounting locations for hardware.
 8. Door and frame sizes, materials and degrees of swing.
 9. List of manufacturers used and their nearest representative with address and phone number.
 10. Catalog cuts.
 11. Point-to-point wiring diagrams.
 12. Manufacturer's technical data and installation instructions for electronic hardware.
- B. Bid and submit manufacturer's updated/improved item if scheduled item is discontinued.
- C. Deviations: Highlight, encircle or otherwise identify deviations from "Schedule of Finish Hardware" on submittal with notations clearly designating those portions as deviating from this section.
- D. If discrepancy between drawings and scheduled material in this section, bid the more expensive of the two choices, note the discrepancy in the submittal and request direction from Architect for resolution.
- E. Substitutions per Division 1. Include product data and indicate benefit to the Project. Furnish operating samples on request.
- F. Items listed with no substitute manufacturers have been requested by Owner to meet existing standard.
- G. Furnish as-built/as-installed schedule with closeout documents, including keying schedule, riser and point-to-point wiring diagrams, manufacturers' installation, adjustment and maintenance information, and supplier's final inspection report.

1.4 QUALITY ASSURANCE

- A. Hardware: Free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer.
- B. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.
- C. Fire-Rated Openings: NFPA 80 compliant. Hardware UL10C (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, and resilient seals. Coordinate with wood door section for required intumescent seals. Furnish openings complete.
- D. Furnish hardware items required to complete the work in accordance with specified performance level and design intent, complying with manufacturers' instructions and code requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Delivery: coordinate delivery to appropriate locations (shop or field).
1. Permanent keys and cores: secured delivery direct to Owner's representative.

- B. Acceptance at Site: Items individually packaged in manufacturers' original containers, complete with proper fasteners and related pieces. Clearly mark packages to indicate contents, locations in hardware schedule and door numbers.
- C. Storage: Provide securely locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, dust, excessive heat and cold, etc.

1.6 PROJECT CONDITIONS AND COORDINATION

- A. Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical the same operation and quality as type specified, subject to Architect's approval.
- B. Coordination: Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents. Furnish related trades with the following information:
 - 1. Location of embedded and attached items to concrete.
 - 2. Location of wall-mounted hardware, including wall stops.
 - 3. Location of finish floor materials and floor-mounted hardware.
 - 4. At masonry construction, coordinate with the anchoring and hollow metal supplier prior to frame installation by placing a strip of insulation, wood, or foam, on the back of the hollow metal frame behind the rabbet section for continuous hinges, as well as at rim panic hardware strike locations, silencers, coordinators, and door closer arm locations. When the frame is grouted in place, the backing will allow drilling and tapping without dulling or breaking the installer's bits.
 - 5. Coordinate: flush top rails of doors at outswinging exteriors, and throughout where adhesive-mounted seals occur.
 - 6. Manufacturers' templates to door and frame fabricators.
 - 7. Locations for conduit and raceways as needed for electrical, electronic, and electro-pneumatic hardware items. Fire/life-safety system interfacing. Point-to-point wiring diagrams plus riser diagrams to related trades.
 - 8. Coordinate : low-voltage power supply locations.
 - 9. Coordinate: back-up power for doors with automatic operators.
- C. Check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.
- D. Environmental considerations: segregate unused recyclable paper and paper product packaging, uninstalled metals, and plastics, and have these sent to a recycling center.

1.7 WARRANTY

- A. Part of respective manufacturers' regular terms of sale. Provide manufacturers' written warranties.
- B. Include factory order numbers with close-out documents to validate warranty information, required for Owner in making future warranty claims:

- C. Minimum warranties:
- | | | |
|----|------------------------------------|---|
| 1. | Mortise Locksets: | Ten years |
| 2. | Extra Heavy Duty Cylindrical Lock: | Ten Years |
| 3. | Exit Devices: | Ten years mechanical
Three years electrical |
| 4. | Closers: | Thirty years mechanical
Two years electrical |
| 5. | Hinges: | One year |
| 6. | Other Hardware | Two years |

1.8 COMMISSIONING

- A. Conduct these tests prior to request for certificate of substantial completion:
1. With installer present, test door hardware operation with climate control system and stairwell pressurization system both at rest and while in full operation.

1.9 REGULATORY REQUIREMENTS

- A. Locate latching hardware between 34 inches to 44 inches above the finished floor, per 2022 California Building Code, Section 11B-404.2.7.
1. Panic hardware: locate between 36 inches to 44 inches above the finished floor.
- B. Handles, pull, latches, locks, other operable parts:
1. Readily openable from egress side with one hand and without tight grasping, tight pinching, or twisting of the wrist to operate. 2022 California Building Code Section 11B-309.4.
 2. Force required to activate the operable parts: 5.0 pounds maximum, per 2022 California Building Code Section 11B-309.4.
- C. Adjust doors to open with not more than 5.0-pounds pressure to open at exterior doors and 5.0-pounds at interior doors. As allowed per 2022 California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15-pounds.
1. Exception: exterior doors' pressure-to-open may be increased to 8.5-pounds if: at a single location, and one of a bank of eight leafs or fraction of eight, and one leaf of this bank is fitted with a low- or high-energy operator.
- D. Adjust door closer sweep periods so that from an open position of 90 degrees, the door will take at least 5 seconds to move to a point 12 degrees from the latch, measured to the landing side of the door, per 2022 California Building Code Section 11B-404.2.8.
1. Spring hinges: adjust for 1.5 seconds minimum for 70 degrees to fully-closed.
- E. Smooth surfaces at bottom 10 inches of push sides of doors, facilitating push-open with wheelchair footrests, per 2022 California Building Code Section 11B-404.2.10.
1. Applied kickplates and armor plates: bevel the left and right edges; free of sharp or abrasive edges.
 2. Tempered glass doors without stiles: bottom rail may be less than 10 inches if top leading edge is tapered 60 degrees minimum.

- F. Door opening clear width no less than 32 inches, measured from face of frame stop, or edge of inactive leaf of pair of doors, to door face with door opened to 90 degrees. Hardware projection not a factor in clear width if located above 30 inches and below 80 inches, and the hardware projects no more than 4 inches. 2022 California Building Code Section 11B-404.2.3.
1. Exception: doors not requiring full passage through the opening, that is, to spaces less than 24 inches in depth, may have the clear opening width reduced to 20 inches. Example: shallow closets.
 2. Door closers and overhead stops: not less than 78 inches above the finished floor or ground, per 2022 California Building Code 11B-307.4.
- G. Thresholds: floor or landing no more than 0.50 inches below the top of the threshold of the doorway, per 2022 California Building Code Section 11B-404.2.5. Vertical rise no more than 0.25 inches, change in level between 0.25 inches and 0.50 inches: beveled to slope no greater than 1:2 (50 percent slope). 2022 California Building Code Section 11B-303.2 & ~.3.
- H. Floor stops: Do not locate in path of travel. Locate no more than 4 inches from walls.
- I. Pairs of doors with independently-activated hardware both leaves: limit swing of right-hand or right-hand-reverse leaf to 90 degrees to protect persons reading wall-mounted tactile signage, per 2022 California Building Code Section 11B-703.4.2.
- J. Door and door hardware encroachment: when door is swung fully-open into means-of-egress path, the door may not encroach/project more than 7 inches into the required exit width, with the exception of door release hardware such as lockset levers or panic hardware. These hardware items must be located no less than 34-inches and no more than 48-inches above the floor/ground. 2022 California Building Code, Section 1005.7.1.
2. In I-2 occupancies, surface mounted latch release hardware, mounted to the side of the door facing away from the adjacent wall where the door is in the open position, is not exempt from the inclusion in the 7-inch maximum encroachment, regardless of its mounting height, per 2022 California Building Code, Section 1005.7.1 at Exception 1.
- K. New buildings that are included in public schools (kindergarten through 12th grade) state funded projects and receiving state funding pursuant to Leroy F. Green, School Facilities Act of 1998, California Education Code Sections 17070.10 through 17079, and that are submitted to the Division of the State Architect for plan review after July 1, 2011 in accordance with the Education Code 17075.50, shall include locks that allow doors to classrooms and any room with an occupancy of five or more persons to be locked from the inside. The locks shall conform to the specification and requirements found in 2022 California Building Code Section 1010.2.8.2.

Exceptions:

1. Doors that are locked from the outside at all times such as, but not limited to, janitor's closet, electrical room, storage room, boiler room, elevator equipment room and pupil restroom.
2. Reconstruction projects that utilize original plans in accordance with California Administrative Code, Section 4-314.
3. Existing relocatable buildings that are relocated within same site in accordance with California Administrative Code, Section 4-314.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Listed acceptable alternate manufacturers: these will be considered; submit for review products with equivalent function and features of scheduled products.

ITEM:	MANUFACTURER:	ACCEPTABLE ALTERNATE:
Hinges	(IVE) Ives	Bommer
Key System	(RUS) Corbin/Russwin	Owner standard
Mechanical Locks	(SCH) Schlage	Owner standard
Exit Devices	(VON) Von Duprin	Owner standard
Closers	(LCN) LCN	Owner standard
Auto Flush Bolts	(IVE) Ives	DCI
Coordinators	(IVE) Ives	DCI
Silencers	(IVE) Ives	Rockwood, Trimco
Push & Pull Plates	(IVE) Ives	Rockwood, Trimco
Kickplates	(IVE) Ives	Rockwood, Trimco
Stops & Holders	(IVE) Ives	Rockwood, Trimco
Overhead Stops	(GLY) Glynn-Johnson	ABH
Thresholds	(ZER) Zero	NGP, Pemko
Seals & Bottoms	(ZER) Zero	NGP, Pemko
Key Cabinets	(LUN) Lund	TelKee
Aluminum Door Locks	(ADA) Adams Rite	None

2.2 HINGING METHODS

- A. Drawings typically depict doors at 90 degrees, doors will actually swing to maximum allowable. Use wide-throw conventional or continuous hinges as needed up to 8 inches in width to allow door to stand parallel to wall for true 180-degree opening. Advise architect if 8-inch width is insufficient.
- B. Conform to manufacturer's published hinge selection standard for door dimensions, weight and frequency, and to hinge selection as scheduled. Where manufacturer's standard exceeds the scheduled product, furnish the heavier of the two choices, notify Architect of deviation from scheduled hardware.
- C. Conventional Hinges: Steel or stainless steel pins and approved bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.

1. Outswinging exterior doors: non-ferrous with non-removable (NRP) pins and security studs.
2. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.

2.3 LOCKSETS, LATCHSETS, DEADBOLTS

- A. Extra Heavy Duty Cylindrical Locks and Latches: as scheduled.
1. Chassis: cylindrical design, corrosion-resistant plated cold-rolled steel, through-bolted.
 2. Locking Spindle: stainless steel, integrated spring and spindle design.
 3. Latch Retractors: forged steel. Balance of inner parts: corrosion-resistant plated steel, or stainless steel.
 4. Latchbolt: solid steel.
 5. Backset: 2.75 inches typically, more or less as needed to accommodate frame, door or other hardware.
 6. Lever Trim: accessible design, independent operation, spring-cage supported, minimum 2.00 inches clearance from lever mid-point to door face.
 7. Electric operation: Manufacturer-installed continuous duty solenoid.
 8. Strikes: 16 gage curved steel, bronze or brass with 1.00 inch deep box construction, lips of sufficient length to clear trim and protect clothing.
 9. Lock Series and Design: Schlage ND series, "Rhodes" design.
 10. Certifications:
 - a) ANSI A156.2, Series 4000, Grade 1.
 - b) UL listed for A label and lesser class single doors up to 4 feet x 8 feet.
 11. Accessibility: Require not more than 5 lb to retract the latchbolt or deadbolt, or both, per CBC 2022 11B-404.2.7 and 11B-309.4

2.4 EXIT DEVICES / PANIC HARDWARE

- A. General features:
1. Independent lab-tested 1,000,000 cycles.
 2. Push-through push-pad design. No exposed push-pad fasteners, no exposed cavities when operated. Return stroke fluid dampeners and rubber bottoming dampeners, plus anti-rattle devices.
 3. Deadlocking latchbolts, 0.75 inch projection.
 4. End caps: impact-resistant, flush-mounted. No raised edges or lips to catch carts or other equipment.

5. Panic hardware to be compliant with SFM standard 12-10-3, section 12-10-302.
 - a) The cross-bar shall extend across not less than one-half the width of the door/gate.
 - b) The ends of the cross-bar shall be curved, guarded or otherwise designed to prevent catching on the clothing of persons during egress.
 6. No exposed screws to show through glass doors.
 7. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.
 8. Releasable in normal operation with 15-pound maximum operating force per UBC Standard 10-4, and with 32-pound maximum pressure under 250-pound load to the door.
 9. Exterior doors scheduled with XP-series devices: Static load force resistance of at least 2000 pounds.
 10. Accessibility: Require not more than 5 lb to retract the latchbolt, per CBC 2022 11B-404.2.7 and 11B-309.4.
 - a) Mechanical method: Von Duprin "AX-" feature, where touchpad directly retracts the latchbolt with 5 lb or less of force. Provide testing lab certification confirming that the mechanical device is independent third-party tested to meet this 5 lb requirement.
 - b) Electrical method: Von Duprin's "RX-QEL-", where lightly pressing the touchpad with 5 lb or less of force closes an electric switch, activating quiet electric latch retraction.
- B. Specific features:
1. Non-Fire Rated Devices: cylinder dogging.
 2. Lever Trim: breakaway type, forged brass or bronze escutcheon min. 0.130 inch thickness, compression spring drive, match lockset lever design.
 3. Rod and latch guards with sloped full-width kickplates for doors fitted with surface vertical rod devices with bottom latches.
 4. Fire-Labeled Devices: UL label indicating "Fire Exit Hardware". Vertical rod devices less bottom rod (LBR) unless otherwise scheduled.
 5. Impact recessed devices: 1.25 inch projection when push-pad is depressed. Sloped metal end caps to deflect carts, etc. No pinch points to catch skin between touchbar and door.
 6. Delayed Egress Devices: Function achieved within single exit device component, including latch, delayed locking device, request-to-exit switch, nuisance alarm, remote alarm, key switch, indicator lamp, relay, internal horn, door position input, external inhibit input plus fire alarm input. NFPA 101 "Special Locking Arrangement" compliant.
 7. Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.

8. Removable Mullions: Removable with single turn of building key. Securely reinstalled without need for key. Furnish storage brackets for securely stowing the mullion away from the door when removed.
9. Accepted substitutions: None

2.6 CLOSERS

A. Surface Closers:

1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat-treated pinion shaft, single piece forged piston, chrome-silicon steel spring.
2. ISO 2000 certified. Units stamped with date-of-manufacture code.
3. Independent lab-tested 10,000,000 cycles.
4. Non-sized, non-handed, and adjustable. Place closer inside building, stairs, and rooms.
5. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.
6. Adjust doors to open with not more than 5.0-pounds pressure to open at exterior doors and 5.0-pounds at interior doors. As allowed per 2022 California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15-pounds.
 - a) Exception: exterior doors' pressure-to-open may be increased to 8.5-pounds if: at a single location, and one of a bank of eight leafs or fraction of eight, and one leaf of this bank is fitted with a low- or high-energy operator.
7. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.
8. Extra-duty arms (EDA) at exterior doors scheduled with parallel arm units.
9. Exterior door closers: tested to 100 hours of ASTM B117 salt spray test, furnish data on request.
10. Exterior doors: seasonal adjustments not required for temperatures from 120 degrees F to -30 degrees F, furnish checking fluid data on request.
11. Non-flaming fluid, will not fuel door or floor covering fires.
12. Pressure Relief Valves (PRV) not permitted.
13. Accepted substitutions: None

2.7 OTHER HARDWARE

- ### A. Automatic Flush Bolts: Low operating force design.

- B. Overhead Stops: Non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.
- C. Kick Plates: Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.
- D. Door Stops: Provide stops to protect walls, casework or other hardware.
 - 1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where floor type cannot be used, provide wall type. If neither can be used, provide overhead type.
 - 2. Locate overhead stops for maximum possible opening. Consult with Owner for furniture locations. Minimum: 90deg stop / 95deg deadstop. Note degree of opening in submittal.
 - 3. Include automatic type door bottoms, as opposed to fixed sweeps, at stairs and elevator lobbies to allow fine-tuning of pressurization systems.
- E. Thresholds: As scheduled and per details. Comply with CBC 2022 11B-404.2.5. Substitute products: certify that the products equal or exceed specified material's thickness. Proposed substitutions: submit for approval.
 - 1. Saddle thresholds: 0.125 inches minimum thickness.
 - 2. Exteriors: Seal perimeter to exclude water and vermin. Use sealant complying with requirements in Division 7 "Thermal and Moisture Protection". Minimum 0.25 inch diameter fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors. National Guard Products' "COMBO" or Pemko Manufacturing's "FHSL".
 - 3. Fire-rated openings, 90-minutes or less duration: use thresholds to interrupt floor covering material under the door where that material has a critical radiant flux value less than 0.22 watts per square centimeter, per NFPA 253. Use threshold unit as scheduled. If none scheduled, include a 0.25in high 5in wide saddle in the bid, and request direction from Architect.
 - 4. Fire-rated openings, 3-hour duration: Thresholds, where scheduled, to extend full jamb depth.
 - 5. Acoustic openings: Set units in full bed of Division-7-compliant, leave no air space between threshold and substrate.
 - 6. Plastic plugs with wood or sheet metal screws are not an acceptable substitute for specified fastening methods.
 - 7. Fasteners: Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression.
- F. Through-bolts: Do not use. Coordinate with wood doors; ensure provision of proper blocking to support wood screws for mounting panic hardware and door closers. Coordinate with metal doors and frames; ensure provision of proper reinforcement to support machine screws for mounting panic hardware and door closers.
 - 1. Exception: surface-mounted overhead stops, holders, and friction stays.

- G. Silencers: Interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Leave no unfilled/uncovered pre-punched silencer holes. Intent: door bears against silencers, seals make minimal contact with minimal compression – only enough to effect a seal.

2.8 FINISH

- A. Generally: BHMA 626 Satin Chromium.
 - 1. Areas using BHMA 626: furnish push-plates, pulls and protection plates of BHMA 630, Satin Stainless Steel, unless otherwise scheduled.
- B. Door closers: factory powder coated to match other hardware, unless otherwise noted.

2.9 KEYING REQUIREMENTS

- A. Key System: existing (Corbin-Russwin) system. Initiate and conduct meeting(s) with Owner to determine system structure, furnish Owner's written approval of the system; do not order keys or cylinders without written confirmation of actual requirements from the Owner. Furnish temporary construction-keyed and permanent cylinders. Contractor to demonstrate to the Owner that temporary keys no longer operate the locking cylinders at the end of the project.

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS

- A. Can read and understand manufacturers' templates, suppliers' hardware schedule and printed installation instructions. Can readily distinguish drywall screws from manufacturers' furnished fasteners. Available to meet with manufacturers' representatives and related trades to discuss installation of hardware.

3.2 PREPARATION

- A. Ensure that walls and frames are square and plumb before hardware installation. Make corrections before commencing hardware installation. Installation denotes acceptance of wall/frame condition.
- B. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.
 - 1. Notify Architect of code conflicts before ordering material.
 - 2. Locate latching hardware between 34 inches to 42 inches above the finished floor, per California Building Code, Section 1010.1.9.2 and 115-404.2.7.
 - 3. Locate panic hardware between 36 inches to 44 inches above the finished floor.
 - 4. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.
- C. Overhead stops: before installing, determine proposed locations of furniture items, fixtures, and other items to be protected by the overhead stop's action.
- D. Existing frames and doors to be retrofitted with new hardware:
 - 1. Field-verify conditions and dimensions prior to ordering hardware. Fill existing hardware cut outs not being reused by the new hardware. Remove existing hardware not being reused, return to Owner unless directed otherwise.
 - 2. Remove existing floor closers not scheduled for reuse, fill cavities with non-shrinking concrete and finish smooth.

3. Cut and weld existing steel frames currently prepared with 2.25 inch height strikes. Cut an approximate 8 inch section from the strike jamb and weld in a reinforced section to accommodate specified hardware's strike.
4. Patch and weld flush filler pieces into existing door hardware preparations in steel doors and frames, leave surfaces smooth.
5. Glue in solid wood block fillers to fill cut outs in existing wood doors, sand surfaces smooth. Alternatively, use an approved epoxy-based wood filler product, submit product data for approval.

3.3 INSTALLATION

- A. Install hardware per manufacturer's instructions and recommendations. Do not install surface-mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation. Remove and reinstall or replace work deemed defective by Architect.
 1. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc; fasten hardware over and through these seals. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
 2. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.
 3. Use manufacturers' fasteners furnished with hardware items, or submit Request for Substitution with Architect.
 4. Replace fasteners damaged by power-driven tools.
- B. Locate floor stops no more that 4 inches from walls and not within paths of travel. See paragraph 2.2 regarding hinge widths, door should be well clear of point of wall reveal. Point of door contact no closer to the hinge edge than half the door width. Where situation is questionable or difficult, contact Architect for direction.
- C. Core concrete for exterior door stop anchors. Set anchors in approved non-shrink grout.
- D. Locate overhead stops for minimum 90 degrees at rest and for maximum allowable degree of swing.
- E. Drill pilot holes for fasteners in wood doors and/or frames.
- F. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.
- G. Field-verify existing conditions and measurements prior to ordering hardware. Fill existing hardware cut outs not being used by the new hardware.
- H. Remove existing hardware not being reused. Tag and bag removed hardware, turn over to Owner.
- I. Where existing wall conditions will not allow door to swing using the scheduled hinges, provide wide-throw hinges and if needed, extended arms on closers.

3.4. ADJUSTING

- A. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.
 - 1. Hardware damaged by improper installation or adjustment methods: repair or replace to Owner's satisfaction.
 - 2. Adjust doors to fully latch with no more than 1 pound of pressure.
 - a) Door closer valves: turn valves clockwise until at bottom – do not force. Turn valves back out one and one-half turns and begin adjustment process from that point. Do not force valves beyond three full turns counterclockwise.
 - 3. Adjust delayed-action closers on fire-rated doors to fully close from fully-opened position in no more than 10 seconds.
 - 4. Adjust door closers per 1.9 this section.
- B. Fire-rated doors:
 - 1. Wood doors: adjust to 0.125 inches clearance at heads, jambs, and meeting stiles.
 - 2. Steel doors: adjust to 0.063 inches minimum to 0.188 inches maximum clearance at heads, jambs, and meeting stiles.
 - 3. Adjust wood and steel doors to 0.75 inches maximum clearance (undercut) above threshold or finish floor material under door.
- C. Final inspection: Installer to provide letter to Owner that upon completion installer has visited the Project and has accomplished the following:
 - 1. Has re-adjusted hardware.
 - 2. Has evaluated maintenance procedures and recommend changes or additions, and instructed Owner's personnel.
 - 3. Has identified items that have deteriorated or failed.
 - 4. Has submitted written report identifying problems.

3.5 DEMONSTRATION

- A. Demonstrate mechanical hardware and electrical, electronic and pneumatic hardware systems, including adjustment and maintenance procedures.

3.6 PROTECTION/CLEANING

- A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion.
- B. Clean adjacent wall, frame and door surfaces soiled from installation / reinstallation process.

3.7 SCHEDULE OF FINISH HARDWARE

- A. See door schedule in drawings for hardware set assignments.
- B. Do not order material until submittal has been reviewed, stamped, and signed by Architect's door hardware consultant.

- C. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

OVERTUR 137756 V3 /OPT0441295

HARDWARE GROUP NO. 01

For use on Door #(s):

G-1A G-2A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	D&D TECHNOLOGIES HINGE	CI12 SERIES	ZN	TBD
1	EA	PANIC HARDWARE	CDSI-PA-AX-99-NL-990 TRIM	626	VON
1	EA	MORTISE CYLINDER	1000-118-A01-6	626	RUS
1	EA	RIM CYLINDER	3000-200	626	RUS
1	EA	SURFACE CLOSER	4040XP EDA SRI	689	LCN
1	EA	MOUNTING PLATE	4040XP-18PA SRI (AS REQUIRED)	689	LCN
1	EA	FLOOR STOP	FS18L	BLK	IVE

HARDWARE GROUP NO. 02

For use on Door #(s):

G-2B G-2C G-2D

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	D&D TECHNOLOGIES HINGE	CI12 SERIES	ZN	TBD
1	EA	FORK GATE LATCH	BY GATE MANUFACTURER		B/O

HARDWARE GROUP NO. 04

For use on Door #(s):

23A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S RHO OS-OCC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PROTECTION PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	THRESHOLD	THRESHOLD AS DETAILED		
1	EA	COAT AND HAT HOOK	571	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 05

For use on Door #(s):

22

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	ND70LD RHO	626	SCH
1	EA	CYLINDER	2200-002-A21	626	RUS
1	EA	THRESHOLD	103A-223	A	ZER

VERIFY KEY REQUIRED

BALANCE OF EXISTING HARDWARE TO REMAIN

ADJUST EXISTING CLOSER TO MEET 5 POUND OPERATING FORCE AS REQUIRED BY CALIFORNIA
BUILDING CODE SECTION 11B-404.2.9

Maintenance Materials, provide the following:

- As-built hardware schedule
- Copies of warranty information for each hardware type
- Binder of catalog cuts or complete catalog sections of items used, installation and maintenance/adjustment information.
- Collection of tools that were included with the hardware: wrenches, drivers, etc.

END OF SECTION

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Glass and glazing for Sections referencing this Section for products and installation.
- B. Mirrors larger than 18 x 30 inches.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. 2022 California Building Code, Chapter 24, Table 2403.2.1, Tables 2406.2(1) and 2406.2(2).
- C. 2022 California Energy Code, Title 24, Part 6, Subchapter 2, Sections 110.6 and Subchapter 5, Section 140.3.
- D. 2022 California Administrative Code, Chapter 10, Sections 10-111 and 10-112.
- E. ASTM C1036 - Standard Specification for Flat Glass
- F. ASTM C1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass
- G. ASTM D792 - Density and Specific Gravity (Relative Density) and Density of Plastics by Displacement.
- H. ASTM E 2190 - Insulating Glass Unit Performance and Evaluation
- I. GANA - Glass Association of North America - Glazing Manual, Latest Edition
- J. GANA - Glass Association of North America - Sealant Manual, Latest Edition
- K. AAMA - 92, Voluntary Specification and Test Methods for Sealants
- L. GTA - Glass Tempering Division of Glass Association of North America
- M. LSGA - Laminators Safety Glass Association - Standards Manual
- N. SIGMA - Sealed Insulated Glass Manufacturers Association - Glazing Manual
- O. IGMA - Insulating Glass Manufacturers Alliance
- P. Chapter 24, 2022 California Building Code
- Q. Section KCMZ, UL Fire Resistance Directory, Volume 3, Latest Edition.
- R. California Code of Regulations, Title 24
 - 1. CBC California Building Code (CBC) 2022
 - 2. CRSC California Referenced Standards Code, Standard 12-7-4, fire door tests

- S. NFPA-80 Fire Doors and Fire Windows
- T. NFPA-257 Fire Test for Windows and Glass Block Assemblies
- U. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing Material, Consumer Protection Safety Commission, Code of Federal Regulations. All glazing shall pass the test requirements of CPSC 16 CFR 1201, listed in Chapter 35. Comply with the CPSC 16 CFR, Part 1201 criteria, for Category I or II as indicated in Table 2406.1, CBC. Required for fully tempered glass, laminated glass, and wire Glass.
- V. ANSI Z-97.1-84 (R1994) - Performance Specifications and Methods of Test for Transparent Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Method of Test. Required for fully tempered glass, laminated glass.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass sloped 15 degrees or less from vertical in windows, curtain and window walls, doors and other exterior applications shall be designed to resist the wind load in Section 1609.6.4.4 and Table 1609.6.2(2). Glass in glazed curtain walls, glazed storefronts and glazed partitions shall meet the seismic requirements of ASCE 7, Section 13.5.9. Load resistance under uniform load per ASTM E1300.
 - 1. Sloped glass: CBC Section 2404.2 and Section 2405 Sloping Glass and Skylights.
- C. Provide minimum frame lap in accordance with Table 2403.2.1, California Building Code and Note "1" for design wind and earthquake drift.
- D. Glazing materials and assemblies shall be tested in accordance with California Referenced Standards Code, Standard 12-7-4 and NFPA 80 Fire Doors and Fire Windows and shall be labeled and installed in accordance with their listing.
- E. Glazing in fire door and fire window assemblies subject to human impact loads and in hazardous locations shall comply with requirement of CBC Sections 2406.2 and 2406.4.
- F. Air and Water Infiltration per ASTM E283 and ASTM E331.
- G. Performance Rating: Glazing U-Factor, Relative Solar Heat Gain Coefficient and Visible Transmittance shall be rated in accordance with the T-24 Energy Report per maxima and minimum requirements in California Energy Code, Subchapter 5, Section 140.3(a)5 and Table 140.3-B.
- H. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the CBC and ASCE 7/SEI 7.

1. Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE/SEI 7, based on heights above grade indicated on Drawings.
 - a. Basic Wind Speed (Ultimate design wind speed): 115 mph
 - b. Seismic Importance Factor: 1.25 for schools, Category II
 - c. Exposure Category: C
2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch whichever is less.

1.4 SUBMITTALS

- A. Product Data on Glass Types Specified: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- B. Three samples of each material specified illustrating coloration and design.
- C. Submit certification of Manufacturer's Certified Fabricators.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- B. Glass Fabricators: Member of manufacturer's Certified Fabricator Program (CFP)
 1. Program members participate in rigorous training program on processing of sophisticated glass products, including high-performance coated glasses.
 2. Subject to comprehensive, multiple-day audit addresses glass fabrication equipment as well as their documented processing procedures.
- C. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from single manufacturer for each product and installation method indicated.
- D. Perform Work in accordance with:
 1. GANA Glazing Manual.
 2. GANA Sealant Manual.
 3. LSGA Standards Manual.
 4. IGMA/SIGMA Glazing Manual, Class CBA.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install glazing when ambient temperature is less than 50 degrees F.

1.7 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

1.8 COORDINATION

- A. Coordinate the Work with glazing frames, wall openings, and perimeter air and vapor seal to adjacent Work.

1.9 WARRANTY

- A. Provide one-year manufacturer's warranty from Date of Substantial Completion for defective products including broken, cracked or otherwise damaged glass not caused by vandalism. Water intrusion through sealant/glass joint.

1.10 IDENTIFICATION

- A. Each pane shall bear the manufacturer's mark designating the type and thickness of glass and glazing material. Conform to Section 2403.1, California Building Code. Safety glass shall be identified in accordance with CBC Section 2406.3.
- B. Each pane of safety glazing material installed in hazardous locations required per Section 2406.1 and as defined in Section 2406.3 Chapter 24, California Building Code. Safety glass shall be identified by a label which will specify the labeler, whether the manufacturer or installer, and state that safety glazing material has been utilized in such installation.
 - 1. Identification shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of that type once applied, cannot be removed without being destroyed, on glass and readable from inside of building after installation.
 - 2. Label text shall comply with Section 2406.3.
- C. Each pane of tempered glass, except tempered spandrel glass, shall be permanently identified by the manufacturer. The identification mark shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of the type that once applied cannot be removed without being destroyed. Tempered spandrel glass shall be provided with a removable paper marking by the manufacturer.
- D. Each lite of fire-rated glazing shall be identified by a label that verifies fire-resistant glazing as per CBC Sections 716.5.8.3.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - FLAT GLASS MATERIALS

- A. Products of following manufacturers form basis for design and quality intended.
 - 1. Vitro Architectural Glass, Pittsburgh, PA.
 - 2. Guardian Industries Corp. Kingsburg, CA, Corsicana TX.
 - 3. Pilkington Libbey-Owens-Ford Co, Toledo, OH.
 - 4. AFG Industries Inc., Kingsport, TN.
 - 5. AGC

- B. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.2 GLASS MATERIALS

- A. NOT USED

2.3 FIRE RATED GLASS

- A. NOT USED

2.4 MIRROR GLASS

- A. Mirror Glass: Vinyl-backed safety mirror glass, per CPSC 16 CFR 1201, Category II and ANSI Z-97.1, 1/4 inch thick minimum, sizes as noted on Drawings.
 - 1. Frame: Frame face 3/4 x 3/4 inch welded seamless stainless steel, No. 304 finish, 20 gauge galvanized steel backing, Series No. 290, by Bobrick Washroom Equipment Inc., North Hollywood, CA, or equal.
 - 2. Edges: Flat polished edges.
 - 3. Mounting: concealed mounting wall hangers with theft-resistant locking devices.
 - 4. For unframed mirrors: stainless steel edge channels at top and bottom and mastic bond to wall. Flat polish, ground arris (bevel) at exposed edges, UNO.
 - 5. Mirror Mastic: Adhesive setting compound and barrier coat, produced specifically for setting mirrors, compatible with glass coating and substrate on which mirrors will be installed, Gunther Mirror Mastics, Palmer Products Incorporated or equal.

2.5 GLAZING ACCESSORIES

- A. Setting Blocks: 80-90 Shore A Durometer Hardness, length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: 40-50 Shore A Durometer Hardness, minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self-adhesive on one side.
- C. Glazing Tape, minimum 1/8" thick, 1/2" wide, the following:
 - 1. Preformed butyl compound with integral resilient tube spacing device; 10-15 Shore A Durometer Hardness; coiled on release paper; black color.
 - 2. Expanded Cellular Glazing tape, closed-cell, PVC foam tapes, factory coated with adhesive of both surfaces, coiled with released liner, complying with AAMA 800. Type 1 for tape acting as primary sealant, Type 2 tape combination with full bead of sealant.
- D. Glazing Splines: Resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot.

- E. Sealants: for color sealants; Dow Corning 795 Silicone or as specified in Section 07 92 00. Use Pecora 895 Structural Glazing for translucent and structural glazing applications or Tremco Spectrem 2 clear or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify prepared openings.
- B. Verify that openings for glazing are correctly sized and within tolerance.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions and ready to receive glazing.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Mirror Glass: flat polish edge treatment. Edge Sealer: Seal edges for mirror glass after edge treatment to prevent chemical or atmospheric penetration of glass coating.

3.3 EXTERIOR - DRY METHOD (PREFORMED GLAZING)

- A. Cut glazing spline to length; install on glazing pane. Seal corners by butting spline and sealing junctions with butyl sealant.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- D. Install removable stops without displacing glazing. Exert pressure for full continuous contact. Seal stop-screw holes and fill screw tips with silicone before installing.

3.4 EXTERIOR - DRY/WET METHOD (PREFORMED TAPE AND SEALANT)

- A. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.
- B. Apply toe bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- D. Rest glazing on setting blocks and push against tape and toe bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.

- E. Install removable stops, with spacer shims inserted between glazing and applied stops 1/4 inch below sight line. Place glazing tape on glazing panel or unit with tape flush with sight line. Seal stop screw holes and fill screw tips with silicone before installing.
- F. Fill gap between glazing and stop with silicone type sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.
- G. Apply cap bead of silicone type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.5 EXTERIOR - WET METHOD (SEALANT AND SEALANT)

- A. Place setting blocks at 1/4 points and install glazing pane or glass unit.
- B. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line. Seal stop screw holes and fill screw tips with silicone before installing.
- C. Fill gaps between glazing and stops with silicone type sealant to depth of bite on glazing, but not more than 3/8 inch below sight line, to ensure full contact with glazing and continue the air and vapor seal.
- D. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.6 INTERIOR - DRY METHOD (TAPE AND TAPE)

- A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- D. Place glazing tape on free perimeter of glazing in same manner described above.
- E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact. Seal stop screw holes and fill screw tips with silicone before installing.
- F. Knife trim protruding tape.

3.7 INTERIOR - DRY/WET METHOD (TAPE AND SEALANT)

- A. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or glass unit.

- D. Install removable stops, with spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line. Seal stop-screw holes and fill screw tips with silicone before installing.
- E. Fill gaps between pane and applied stop with silicone type sealant to depth equal to bite on glazing, to uniform and level line.
- F. Trim protruding glazing tape edge.

3.8 INSTALLATION - MIRRORS

- A. Set mirrors in specified frame. For Mastic installation, apply barrier coat and adhesive per manufacturer's instructions for coverage to allow air circulation between back of mirrors and face of mounting surface, minimum 1/8", align mirrors.
- B. Attach assembly to wall with concealed, theft-proof screws.

3.9 MANUFACTURER'S FIELD SERVICES

- A. Glass and glazing product manufacturers to provide field surveillance of the installation of their products.
- B. Monitor and report installation procedures, unacceptable conditions and report deficiencies to the Architect.

3.10 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean and polish surfaces and frames.

3.11 PROTECTION OF FINISHED WORK

- A. Protect finished Work.
- B. After installation, mark pane with an 'X' by using removable plastic tape or paste.

END OF SECTION

SECTION 09 05 61 - COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the furnishing, testing, and application of systems for the reduction of moisture vapor transmission and alkalinity control for all interior concrete slabs scheduled to receive adhered floor coverings.
- B. Related Sections: Coordinate work of this Section with work of other Sections to properly execute the work requirements and maintain satisfactory progress of work in other Sections.
 - 1. Section 03 30 00 - Cast-In Place Concrete.
 - 2. Division 09 Sections for adhered floor coverings.

1.2 REFERENCE STANDARDS

- A. Conform to reference standards by date of issue current on date of Contract Documents.
- B. ASTM International
 - 1. F 710 - Preparing Concrete Floors to Receive Resilient Flooring
 - 2. F 1869 - Measuring Moisture Vapor Emission Rate of Concrete Subfloor
 - 3. F 2170 - Relative Humidity in Concrete Floor Slabs Using in situ Probes
 - 4. F 2420 - Relative Humidity on the Surface of Concrete Floor Slabs
- C. AQMD - Air Quality Management District
 - 1. SCAQMD - South Coast Air Quality Management District, Rule 1113 - Architectural Coatings

1.3 SCHEDULING

- A. Coordinate scheduling of all pre-application testing, application, and post-application testing to allow adequate slab curing and acclimatization prior to testing, and adequate time for curing of the treatment before final testing and installation of floor coverings.

1.4 SUBMITTALS

- A. Product Data: For each type of product and process proposed
- B. Test and Evaluation Reports
- C. Manufacturer's Instructions: For installation
- D. Qualification Statements: For manufacturer and installer
- E. Closeout Submittals

1. Warranty Documentation

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer shall have no less than ten (10) years experience in manufacturing water vapor reduction systems. The water vapor reduction system must be specifically formulated and marketed for water vapor reduction and alkalinity control without change of system design for a minimum period of five (5) years.
- B. Applicator's Qualifications: Currently approved by the manufacturer, experienced in surface preparation and application of the material and subject to inspection of the manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the job site in their original unopened containers, clearly labeled with the manufacturer's name and brand designation.
- B. Store products in an approved ventilated dry area; protect from dampness, freezing, and direct sun light. Product should not be stored in areas with temperatures in excess of 90° F or below 50° F.
- C. Handle product in a manner that will prevent breakage of containers and damage products.

1.7 FIELD CONDITIONS

- A. Environmental Conditions
 - 1. Do not apply moisture vapor reduction system to surfaces that may be exposed to excessive weather conditions (such as rain, wind, etc) until the material has fully cured, or when water is accumulated on the surface of the concrete. Protect freshly applied coating accordingly when material is applied outdoors.
 - 2. Do not apply water vapor reduction system when temperature is lower than 50°F or expected to fall below this temperature within 24 hours from time of application.

1.8 WARRANTY

- A. Manufacturer shall warrant system to maintain moisture vapor emission rate, relative humidity, and pH within specified limits for not less than ten (10) years from the date of Certified Completion.
- B. Manufacturer's warranty shall include all materials and labor to repair or replace concrete slab, damaged floor coverings, and any other construction or Owner's property damaged due to slab failure or resultant mold growth.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of the following manufacturer form the basis of design and quality intended for the Project:

1. KOSTER American Corporation, Virginia Beach, VA.
- B. Subject to compliance with requirements, other acceptable manufacturers include, but are not limited to, the following:
 1. Ardex Engineered Cements, Aliquippa, PA.
 2. Bostik Inc, Wauwatosa, WI.
 3. CHEMREX div of BASF Construction Chemicals, Shakopee, MN.
 4. Duraamen Engineered Products Inc, New York, NY.
 5. MAPEI Americas, Deerfield Beach, FL.
 6. Maxxon Corporation, Flamel, MN.
 7. Miracote div of Crossfield Products Corp, Rancho Dominguez, CA.
 8. ProSpec div of Bonsai American Inc, Charlotte, NC.
 9. Aquafin, Inc., Elkton, MD.
- C. Or equal, as approved in accordance with Division 01 requirements for Substitutions.

2.2 DESCRIPTION

- A. Basis-of-Design: KOSTER VAP I® 2000 System.

2.3 PERFORMANCE CRITERIA

- A. Installed system shall reduce water vapor transmission levels to 3 lbs/1000 ft²/24 hr or less, relative humidity to 75% or less, and pH to between 7.0 and 8.0.
- B. Products shall comply with SCAQMD Rule 1168 VOC limit of 100 g/L.

2.4 MATERIALS

- A. 100% solids epoxy coating, containing specifically formulated chemicals and resins to provide the specified criteria in a one coat system. No multi-coat systems are allowed. System must contain 100% solid epoxy system.
- B. Primers, concrete repair materials, and other accessory products as recommended by moisture vapor reduction treatment manufacturer.
 1. Primer: Koster VAP I 06 Primer
 2. Cementitious Underlayment: Koster SL Standard

PART 3 - EXECUTION

3.1 GENERAL

- A. All new and existing concrete slabs, including slabs-on-grade and suspended slabs, that are scheduled to receive adhered floor coverings, shall be treated regardless of test results; pre-treatment testing is for the manufacturer's and applicator's use in determining the necessary coverage rate.

1. Slab areas not requiring testing or treatment include areas scheduled for the following flooring types:
 - a. Sealed exposed concrete.
 - b. Polished or dyed and polished concrete.
 - c. Depressed slabs to receive mortar-bed tiling.
- B. If pre-application test results indicate variations in the slab conditions among different areas, the coverage rate for the entire slab shall be determined based on the highest moisture area.

3.2 EXAMINATION OF SUBSTRATE BEFORE APPLICATION

- A. Calcium Chloride and RFI Probe test requirements:
 1. Provide anhydrous calcium chloride tests according to ASTM F 1869 protocols.
 - a. Only conduct calcium chloride tests at the same temperature and humidity expected during normal use. If this is not possible, then the test conditions should be 75°F +/-10°F and 50% (+/-10%) relative humidity. Maintain these conditions 48 hours prior to and during testing. Water vapor transmission levels are directly affected by ambient room temperature and readings conducted without a sustained ambient temperature are NOT acceptable.
 2. Provide RH Probe Tests according to ASTM F 2170 protocols.
 3. Provide test results with a marked-up floor finish plan showing test results. Provide a written clarification on status of the ambient air temperature and humidity before and during the testing procedures.
- B. Test for concrete deficiencies and contaminants such as un-reacted water-soluble silicates, chlorides, A.S.R. (alkali-silica reaction), oil contamination, etc. This testing should be performed using standard coring methods. Also, the history of the slab installation should be reviewed. Concrete should conform to ACI Committee 201 Report "Guide to Durable Concrete."

3.3 PREPARATION

- A. Inspect all surfaces with regard to their suitability to receive moisture vapor reduction system with manufacturer's representative.
- B. Clean all surfaces to receive moisture vapor reduction system. Shot blast all floors to a Concrete Surface Profile (CSP) #3 or #4 and clean surfaces with an industrial vacuum cleaner and remove all residues from the substrate. Grinding is allowed only in areas not accessible by shot blasting. Remove ALL defective materials, and foreign matter such as dust, adhesives, leveling compounds, paint, dirt, floor hardeners, bond breakers, oil, grease, curing agents, form release agents, efflorescence, laitance, shot blast beads, etc. Repair all cracks, expansion joints, control joints, and open surface honeycombs and fill in accordance with Manufacturer's recommendations. If concrete additives such as chlorides or any other water-soluble compounds that may contaminate surfaces have been used in the concrete mix do not use this product on that floor without written approval from moisture vapor reducing treatment

manufacturer. Reinforcing fibers that are visible after shot blasting must be removed and vacuumed leaving no fibers left on the concrete surfaces. Provide an uncontaminated, sound surface. DO NOT ACID ETCH!

- C. Repair concrete prior to moisture vapor reduction system installation with approved concrete repair materials. Comply with all requirements as listed in Manufacturer's technical data information. Consult with vapor reduction manufacturer.
- D. Ensure surfaces to be treated with moisture vapor reduction system have NOT previously been treated with other materials such as underlayments, screeds, penetrating sealants, silicates, etc. If this is the case, consult with the Manufacturer's Representative prior to any application of moisture vapor reduction system.
- E. Shot blast a small test area and review surface profile with the finished flooring applicator. As the moisture vapor reduction treatment is not a leveling material, make sure the flooring installer is aware that a feather finish or leveling material may be required to smoothen or level the surface of the treated concrete prior to the flooring installation.

3.4 MIXING

- A. Use clean containers and mix thoroughly as per Manufacturer's requirements to obtain a homogeneous mixture. Use a low speed motor less than 400 rpm and a two bladed Jiffy-type mixing blade only. DO NOT AERATE. Mix ratios are measured by volume.

3.5 APPLICATION

- A. Determine the necessary coverage rate based on the surface profile and porosity of the concrete substrate as well as the measured level of moisture, in accordance with manufacturer's requirements.
- B. After mixing, pour material on the substrate in a ribbon. Empty can completely.
- C. Spread material using a squeegee and back-roll with a 3/8 inch nap epoxy-rated roller leaving NO areas untreated.
- D. Allow to cure a minimum of 12 hours before installing flooring system.
- E. After shot blasting and installation of the vapor reduction system, a self-leveling cementitious underlayment system or patching compound shall be applied for the floor covering installer or floor covering manufacturer to smoothen or level surfaces, at no extra cost to the Owner. Never apply moisture vapor reduction treatment over any new or existing cementitious underlayment system unless approved in writing by the manufacturer.
- F. When water-based adhesives are used in the floor covering installation, use an approved underlayment system together with a non-porous substrate primer prior to the installation of the flooring system, at no extra cost to the Owner. Consult the adhesive manufacturer for their minimum recommended thickness of cementitious underlayment to absorb excess moisture in the adhesive, minimum 1/8" thickness.

3.6 FIELD QUALITY CONTROL

- A. Post-installation testing shall be by IOR or Owner's Testing Laboratory.
- B. Perform ASTM F 710 pH, F 1869, and F 2420 tests after curing of the vapor reduction treatment.
- C. Verify proper adhesion of flooring adhesives, coatings, and leveling compounds to the final vapor reduction coating system for acceptability.
- D. Contractor shall correct any deficiencies identified by Testing Laboratory prior to delivery and installation of flooring materials.

3.7 PROTECTION

- A. Protect water vapor reduction system to prevent damage from active rain or topical water for a minimum period of 24 hours from time of application.
- B. Protect each coat during specified cure period from any kind of traffic, topical water and contaminants.

END OF SECTION

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Formed metal stud framing at interior partitions.
 - 2. Framing accessories.
- B. Related Sections
 - 1. Section 05 40 00 - Cold-Formed Metal Framing for structural applications.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. AISI - American Iron and Steel Institute
 - 1. S100 - Design of Cold-Formed Steel Structural Members.
 - 2. S220 - Cold-Formed Steel Framing - Nonstructural Members.
- C. ASTM International
 - 1. A 1003 - Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
 - 2. C 645 - Standard Specification for Nonstructural Steel Framing Members.
 - 3. A653/A653M - Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy - Coated (Galvannealed) by the Hot-Dip Process.
 - 4. C 754 - Installation of Steel Framing Members to receive Srew-Attached Gypsum Panel Products. 5. C 1513 - Steel Tapping Screws for Cold-Formed Steel Framing Connections.
- D. CBC California Building Code 2022, Chapter 22A.
- E. ICC-ES - ICC Evaluation Service, International Code Council
 - 1. AC46 - Acceptance Criteria for Cold-Formed Steel Framing Members.
 - 2. AC70 - Acceptance Criteria for Fasteners Power-Driven into Concrete, Steel and Masonry Elements
 - 3. AC86 - Acceptance Criteria for Cold-Formed Steel Framing Members—Interior Non-load-Bearing Wall Assemblies.
 - 4. AC118 - Acceptance Criteria for Tapping Screw Fasteners.
- F. SFIA - Steel Framing Industry Association
 - 1. Product Technical Information.

- G. SSMA - Steel Stud Manufacturers Association
 - 1. Product Technical Information.

1.3 SUBMITTALS

- A. Product Data: Manufacturers' printed materials demonstrating compliance with specified requirements.
- B. Test and Evaluation Reports: Current Evaluation Reports, from ICC-ES.
- C. Qualification Statement: For manufacturer

1.4 QUALITY ASSURANCE

- A. Code-Compliance Certification of Studs and Tracks: Provide Documentation that framing members are certified according to the product-certification program of the Steel Framing Industry Association (SFIA) or be a part of a similar organization that provides verifiable code compliance program.
- B. Manufacturer: Current member of SFIA and/or SSMA, regularly and continuously engaged in the manufacturing of non-structural metal framing members for not less than five (5) years.
 - 1. SSMA: Steel Stud Manufacturers Associations, ICC ESR-3064P
 - 2. ClarkDietrich Building Systems, ICC ESR-1166P
 - 3. Cemco California Expanded Metal Products Company, ICC ESR-3016

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISPs "Code of Standard Practice."

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS AND PERFORMANCE CRITERIA

- A. The deflection of steel structural members shall not exceed that permitted by AISI S100.
- B. Power actuated fasteners shall be qualified in accordance with ICC-ES AC70.
- C. The design and installation of nonstructural members utilized in cold-formed steel light-frame construction shall be in accordance with AISI S220.
- D. Headers, including box and back-to-back headers, and double and single L-headers shall be designed in accordance with AISI S100, or proprietary prefabricated headers qualified by current ICC-ES Evaluation Report under AC46.
- E. Wall studs shall be designed in accordance with AISI S100.
- F. Steel studs, non-load bearing, used in gypsum board assemblies shall comply with ASTM C 645.

- G. Steel framing for gypsum boards shall be assembled and installed in compliance with ASTM C 754.
- H. Non-structural metal framing shall be qualified by current ICC-ES Evaluation Reports under AC46 or AC86.

2.2 MATERIALS

- A. Framing Members, General: Comply with ASTM C 645 for conditions indicated.
- B. Steel: ASTM A 1003, Class G60 hot dip galvanized, Grade ST33H, minimum base-steel thickness 0.0329 inch (20 gauge) before galvanizing. Minimum material's yield strength, 33 ksi.
 - 1. Protective Coating: Comply with ASTM C645
 - a. Coatings shall demonstrate equivalent corrosion resistance with an evaluation report acceptable to the authorities having jurisdiction.
 - b. Galvanealed products are not acceptable.

2.3 FABRICATION

- A. Fabricate assemblies to sizes and profiles required; with framing members fitted, reinforced and braced to suit design requirements.
- B. Studs: Non-load bearing rolled steel, channel shaped, punched for utility access.
 - 1. Depths as indicated on Drawings.
 - 2. Flange Width: 1-5/8 inches unless indicated otherwise.
- C. Bottom Track: Same material and finish as studs, channel shaped.
- D. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cemco Slotted Track (CST) Expansion Joint System and "Firestik". ICC ESR-2012.
 - 2. The Steel Network Inc; VertiTrack VTD Series.
 - 3. Or equal, as approved in accordance with Division 01 requirements for Substitutions.
- E. Cold-Rolled Channel Bridging: Steel, 0.053-inch (16 gauge) minimum base-metal thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: As indicated on Drawings.
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.053-inch-thick (16 gauge), galvanized steel.
- F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Depth: 7/8 inch.
- G. Prefabricated Headers: ProX Headers, as manufactured by Brady Construction Innovations Inc, Sacramento, CA (ICC-ES ESR-1765), or equal, as approved in accordance with Division 01 requirements for Substitutions.

2.4 ACCESSORIES

- A. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
 2. Size: #8 by 3/8 inch unless indicated otherwise.
 3. Screws shall be qualified by current ICC-ES Evaluation Report under AC118.
- B. Anchorage Devices, Drilled Expansion Anchors:
 1. Wedge Type: KWIK Bolt TZ Concrete Anchor, 3/8 to 3/4 inch diameter, ICC ESR-4266, by Hilti Inc., Tulsa, OK.
 - a. Eyebolt HHDCA drill-in anchor for suspended ceilings. Provide minimum 14-inch size anchor, requires testing refer to Division 01.
 2. Adhesive Anchors System:
 - a. For Normal Weight concrete with min. compressive strength of 2000 psi or 4000 psi per ICC ESR-2322, Hilti HIT RE 500 Adhesive Anchor System.
- C. Anchorage Devices, Powder Actuated:
 1. Install to conform to the load requirements of this Section and Tables 1, 2, 3 and 4 of ESR 1663. Minimum diameter: 0.145" diameter.
 - a. Utilize tools as recommended by the manufacture in compliance with ICC numbers.
 - b. ICC ESR-1663 Hilti Inc; Fasteners - Manual, Pneumatic, or Powder-Driven Steel Studs and Nails.
 2. Allowable Loads: Values listed in Tables 1-5, ESR 1663.
- D. Metal Backing: Metal-Lite Flushmount & Standard backing, 20 gauge unless noted otherwise.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that conditions are ready to receive work.
- B. Verify field measurements.
- C. Verify that utility rough-ins are in proper location.
- D. Beginning of installation means installer accepts existing conditions.

3.2 ERECTION

- A. For partitions supporting wall-hung plumbing fixtures, casework, or wall-mounted equipment, all exterior walls, and framing of door and borrowed lite openings, refer to Section 05 40 00.
- B. Perform work in accordance with AISI S240, ASTM C 754, and SFIA Product Technical Information or SSMA Product Technical Information.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- C. Layout markings shall not be made with xylene-based inks, paint, or dyes, or with other solvent-based products that may bleed through finishes.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate above ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Do not install post-installed concrete anchors until all prestressing and reinforcing steel locations have been marked on the surface and approved by the Inspector of Record.
 - 2. Install floor track in bedding sealant as specified in Section 07 92 00.
 - 3. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 4. Attach top and bottom runner channels at ends and 24 inches on center maximum.
- E. Opening Framing
 - 1. Frame openings wider than 32 inches as specified in Section 05 40 00.
 - 2. For through-wall openings of 32 inches or less:
 - a. A stud shall be adjacent to all through-wall openings.
 - b. Studs shall be securely anchored to opening frame anchor clips by bolt or screw attachment.
 - c. A header shall be formed over opening, frames, and a sill below opening frames, with a cut-to-length section of runner placed horizontally with the flanges cut and web bent vertically at each end, and securely attached to the adjacent vertical studs.
 - d. Additional cut-to-length vertical ("cripple") studs shall be added above and below openings to comply with stud spacing requirements.
- F. Install studs vertically at 16 inches on centers.
 - 1. Studs where ceramic tile is applied on one or both sides higher than 36 inches: 12 inch spacing required.

2. At slip-type head joints, cut studs 1/2 inch shorter than required length and fit into top runner. Fasten studs to top runner in manner permitting runner movement.
 3. Connect studs to tracks using one fastener at each flange.
 4. Install studs so flanges within framing system point in same direction.
 5. Align stud web openings.
 6. Construct corners using minimum three studs.
 7. Stud splicing not permissible.
 8. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
 9. Where studs are shown to terminate above suspended ceilings, provide bracing as shown or extend studs to underside of structure overhead.
- G. Fit runners under and above openings; secure intermediate studs at spacing of wall studs.
- H. Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
1. Where furring is installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between furring and exterior wall.
- I. Install anchors and blocking for electrical and mechanical work to be placed in or behind stud framing.
- J. In areas where a finish material occurs on one side of wall only, provide bridging or bracing. Two systems permitted:
1. Install 3/4 inch x 16 gage continuous brace through stud punch-outs, fastened to studs with angle clips welded or screw fastened, spaced as scheduled below.
 2. Install 1-1/4 inch x 16 gage strap, 3/4 inch x 16 gage cold-rolled channel or 2-1/2 inch 20 gage stud continuous across unrestrained edges of studs, screw fastened or welded to each stud, and connected to one blocking member screw fastened or welded to adjacent studs.
- K. Lateral Bracing Schedule: Install bridge U-Channel bracing, cold rolled channel CRC (16 gauge), attached to wall studs with steel clip angle, 1/2" less width of wall, using (4) S-12, #10, (2) each leg at per horizontal spacing below per Section D3 AISI. Refer to drawings for strap bracing method where required.
1. Wall Stud Size Bracing Spacing on center (horizontal), maximum
 2. 2-1/2 inch 2'- 6"
 3. 3-5/8 or 4 in 4'- 0"
 4. 6 inch 6'- 0"

- L. Refer to Drawings for indication of partitions extending to ceiling only and for partitions extending through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs.
- M. Verify installation of insulation in multiple stud spaces made inaccessible after stud framing erection.
- N. No flame (oxyacetylene) torch cutting is permitted, use Plasma Arc cutting to make penetrations for conduit or piping where required.

3.3 CLEANING

- A. Clean substrate; remove dirt, oil, grease, construction markings, and foreign matter that could adversely affect final floor finish appearance or performance.

3.4 TOLERANCES

- A. Level and plumb: not more than 1/8" in 10'-0".
- B. Fastening Surfaces: Install each steel framing and furring member so fastening surfaces vary not more than 1/8 inch from the plane formed by the faces of adjacent framing.

END OF SECTION

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SECTION 09 24 00 - PORTLAND CEMENT PLASTERING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Portland cement plasterwork on metal lath.
 - 2. Continuous insulation 2" thick, exterior wall assembly.
- B. Related Sections:
 - 1. Section 09 29 00, Gypsum Board.
- C. Related Requirements
 - 1. Division 05 Section "Cold-Formed Metal Framing" for structural, load-bearing (transverse and axial) steel studs and joists that support lath and Portland cement plaster.
 - 2. Division 09 Section "Non-Structural Metal Framing" for non-structural framing and suspension systems that support lath and Portland cement plaster.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. CCR Title 24, 2022 California Building Code
 - 1. CBC-25 - Chapter 25, Gypsum Board and Plaster
- C. California Energy Code, 2022, Subchapter 5 Section 140.3 and Subchapter 6 Section 141.0(b).
- D. ASTM International
 - 1. A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 2. C 91 - Masonry Cement
 - 3. C 150 - Portland Cement
 - 4. C 847 - Metal Lath
 - 5. C 897 - Aggregate for Job-Mixed Portland Cement-Based Plasters
 - 6. C 926 - Application of Portland Cement-Based Plaster
- 7. C 932 - Surface-Applied Bonding Compounds for Exterior Plastering
- 8. C 954 - Steel Drill Screws
- 9. C 1002 - Steel Self-Piercing Tapping Screws

- 10. C 1063 - Installation of Lathing and Furring
- 11. C 1328 - Plastic (Stucco) Cement
- 12. E 84 - Surface Burning Characteristics of Building Materials
- 13. E 1677 - Air Retarder (AR) Material

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For each type of finish coat indicated; 12 by 12 inches, prepared on rigid backing.
- D. Qualification Statements: Installer

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Company that has successfully completed a minimum of five (5) previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Mock-ups: Before plastering, install mock-ups of system at least 100 sq. ft. in surface area to demonstrate aesthetic effects and waterproofing at all corner and intersections and set quality standards for materials and execution.
 - 1. Install mock-ups for each type of finish indicated.
 - 2. For interior plasterwork, simulate finished lighting conditions for review of mock-ups.
 - 3. Approved mock-ups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Two-Coat Plaster system (base and finish) not permitted.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.6 PROJECT CONDITIONS

- A. Comply with ASTM C 926 requirements.
- B. Exterior Plasterwork

1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
 2. Apply plaster when ambient temperature is greater than 40 deg F.
 3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.
- C. Factory-Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- A. Lathing and plastering materials and accessories shall be marked by the manufacturer's designation to indicate compliance with the referenced standards.
- B. First and second coats of cement shall be applied and moist cured as set forth in ASTM C 926 and as follows:
1. Coat Minimum Moist Curing Period Minimum Interval Between Coats
 - a. First (scratch) 48 Hours 48 Hours
 - b. Second (brown) 48 Hours 7 Days

2.2 PERFORMANCE

- A. Exterior walls shall have an overall assembly U-factor no greater than the applicable value in Table 140.3B, California Energy Code.

2.3 METAL LATH

- A. Diamond-Mesh Lath: ASTM C 847 with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating, non-furred, 3.4 lbs/sq. yd.

2.4 ACCESSORIES

- A. Level 5 smooth finish per District standard.
- B. Furnish attachment devices as required for secure anchoring of plaster accessories. furnish connection devices and splice plates for reveals and slip joints to insure accurate alignment, allowance for axial movement where required
- C. Approved Manufacturers:
1. Brand X Metals, Inc
 2. CEMCO
- D. Fasteners: Anchorage of Lath Accessories (DF Furring strips) to framing: ASTM C1002, Galvanized steel self-tapping (self-piercing) wafer head screws, Type S (for steel framing), No. 8. Increase length by the thickness of substrate to achieve minimum penetration of 3/8" into steel framing.
- E. Metal Accessories

1. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.
 2. External-Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.
 3. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
 4. Expansion Joints: Fabricated from zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
 5. Two-Piece Expansion Joints: Fabricated from zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch wide; with perforated flanges.
- F. "Diamond Furr" Lath Attachment System
1. Basis-of-Design Product: "Diamond Furr" by California Expanded Metal Products Inc. or equal.
 2. Description: System of attachment accessories for application of metal lath over rigid insulation.
 3. Accessories: 2" Gauge/galvanized finish
 - a. DF-2375 18G/G-60 Field Areas with Gasket
 - b. DF-2375 18G/G-60 Inside/Outside Corners
 - c. DFS-2375 24G/G-90 Windows/Doors & termination points
 - d. DFW-2375 24G/G-90 Weep Screed
 - e. DFWD_2375 24G/G-90 Window Drip Flange
 - f. DFXS-2375 24G/G-90 2 piece slip joint
 - g. DFW-FF-IC-2375 24G/G-90 Factory fabricated inside corner weep
 - h. DFW-FF-OC-2375 24G/G-90 Factory fabricated outside corner weep
 - i. DFS-FF-IC-2375 24G/G-90 Factory fabricated inside corner J-stop
 - j. DFS-FF-OC-2375 24G/G-90 Factory fabricated outside corner J-stop
 - k. DF-375NG 18G/G-60 No gasket/backing for reveals
 - l. DF-SSP 24G/G-90 Straight Splicing Part
 - m. DF-SSP 24G/G-90 Pre-Cut 90 degree corner
 - n. DFC 20G/G-90 Clips for trim attachment

2.5 MISCELLANEOUS MATERIALS

- A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in Portland cement plaster.

- C. Bonding Compound: ASTM C 932.
- D. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with screw head that is suitable for application: in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.
- E. Wire for attaching metal lath to Diamond-Furr system: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch (No. 18 gauge) diameter, unless otherwise indicated.
- F. Weather-Resistive Barrier: NFPA 285, ASTM E 1677, Type I air retarder; with minimum of 20 perms when tested in accordance with ASTM E 96, Method A; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested in accordance with ASTM E 84; UV stabilized.
 - 1. Weather-Resistive Barrier: the following below or equal approved by the system manufacturer.
 - a. Tyvek CommercialWrap D-Style 1083.
 - b. Flenry Blueskin VP160, self-adhered.
 - c. Dow Weathermate Plus
 - d. W.R. Grace, Adhered Wall Membrane, self-adhered.
 - e. Vaproshield; WrapShield SA, self-adhered.
 - f. Tape: tape all seams.
 - 2. Metal Studs (open-stud construction): Provide temporary fasteners or approved adhesive strips to "tack" the Water-Resistive Barrier to metal studs where no solid backing (unsheathed studs) is provided.
 - 3. Install permanent fastening with system's furring-strips screws to assure "durability-while-in-service" performance.
- G. Self-Adhered Flashing: for window and door penetrations, 35 mils, nominal, thickness polypropylene film with butyl rubber adhesive.
 - 1. Acceptable Product: or equal approved by the Weather Resistive Barrier manufacturer,
 - a. Rmax R-Seal 6000
- H. Tape for Insulation Joints, clip penetrations: Rmax R-Seal 3000, 2 mils thick, 4" wide, aluminum foil coated with acrylic pressure sensitive adhesive.
- I. Pre-Formed Penetration Flashings: Products of Quickflash Weatherproofing Products, Inc., Las Vegas, NV, or approved equal.
- J. Rigid Insulation, Conforming to NFPA 285: Rmax "ECOMAXci Wall Solution" close-cell polyiso foam core with glass-fiber reinforced aluminum foil facers.

1. Thickness: 2"
- K. Exterior Gypsum Sheathing Board: Exterior grade gypsum board specified in Section 09 29 00.

2.6 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II.
- B. Masonry Cement: ASTM C 91, Type N.
- C. Plastic Cement: ASTM C 1328.
- D. Sand Aggregate: ASTM C 897.
- E. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems, formulated with colorfast mineral pigments and fine aggregates; for use over Portland cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. LaHabra, a brand of ParexLaHabra, Inc.; Acrylic Finish.
 - b. Omega Products International, Inc.; Omega Flex Finishes.
 - c. Acrocrete, BASF Wall Systems, Inc.; Acrotex.
 - d. Dryvit Systems, Inc.; Dryvit TAFS.
 - e. El Rey Stucco Company, Inc., a brand of ParexLaHabra, Inc.; Prema-Flex.
 - f. Finestone, BASF Wall Systems, Inc.; PebbleTex.
 - g. Parex, Inc., a brand of ParexLaHabra, Inc.; e-lastic.
 - h. Senergy, BASF Wall Systems, Inc.; Senerflex.
 - i. Sto Corp.; Powerwall Finish.
 - j. Surewall, a brand of ParexLaHabra, Inc.; Acrylic Finish.
 - k. SonoWall, BASF Wall Systems, Inc.; StuccoTex Finish.
 2. Colors: Custom color(s) as indicated on drawings finish schedule.
- F. Primer: as recommended by plaster manufacturer. "ParexUSA Primer or equal.

2.7 PLASTER MIXES

- A. General: Comply with ASTM C 926 for applications indicated.
 1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. of cementitious materials.
- B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:
 1. Portland and Masonry Cement Mixes

- a. Scratch Coat: For cementitious material, mix 1 part Portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - b. Brown Coat: For cementitious material, mix 1 part Portland cement and 1 part masonry cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
- 2. Portland and Plastic Cement Mixes
 - a. Scratch Coat: For cementitious material, mix 1 part plastic cement and 1 part Portland cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - b. Brown Coat: For cementitious material, mix 1 part plastic cement and 1 part Portland cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
- C. Factory-Prepared Finish-Coat Mixes: For acrylic-based finish coatings, comply with manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Exterior Lath and Plaster shall be applied over approved Ci insulation system over solid substrate exterior sheathing, such as exterior gypsum sheathing surface.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Install sheathing, and seal joints.
- C. Prepare substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.
- D. Weather-Resistive Barrier: Cover wall-assembly surface scheduled for plaster with weather-resistive barrier sheet. Secure with mechanical fasteners, using suitable washers. Tape seams and laps as recommended by sheeting manufacturer. Coordinate with installation of flashing at openings and penetrations.
- E. Install window/door self-adhered flashings as follows:
 - 1. Per Ci Manufacturer's instructions.
 - 2. Product: as recommended by manufacturer.
- F. Install pre-formed penetration flashings.

3.3 INSTALLATION, GENERAL

- A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.
- B. Provide 3-coat plaster work over metal lath at all framed wall assemblies.

3.4 INSTALLATION OF "DIAMOND FURR" LATH ATTACHMENT SYSTEM FOR 2" INSULATION

- A. General
 - 1. install Diamond Furr System termination products prior to the application of weather-resistive barrier, rigid insulation, and metal lath
 - 2. If installing a mechanically applied weather-resistive barrier; install the termination components DFW & DFS series first and then the field pieces DF & DF-OSC series over the barrier fastened to the framing through the sheathing
 - 3. Fastener Type: 1-1/4 inch minimum galvanized wafer head self-tapping screws, unless otherwise noted
 - 4. Fastener Length: Provide fasteners sufficient in length to pass through sheathing and steel framing member with minimum 3/8" penetrations through framing.
 - 5. Fastener Spacing: Maximum 16 inches on center
 - 6. Lath Wire Tie Spacing: Maximum of 6-1/2 inches
- B. DFS-2375: Fasten over gypsum sheathing at termination points requiring J-Mold type plaster stop
- C. DFW-2375 : Fasten over gypsum sheathing at base of exterior wall at uniform height to perform as weep screed
- D. DF-OSC-2375: Fasten over gypsum sheathing to one side of framing member at outside corner conditions as required to maintain continuity in lath depth and angle around outside corners
- E. DF-WD-2375: Fasten over gypsum sheathing over window and door heads, unless otherwise noted on the drawings
- F. DF-XS-2375: Fasten two-piece slip joint at floor line
- G. DFW-FF-IC-2375, DFW-FF-OC-2375, DFS-FF-IC-2375, DFS-FF-OC-2375:
 - 1. Install "Diamond Furr" factory-fabricated corner parts at 90 degree corners connected to DFW and DFS series trims
 - 2. Fasten over gypsum sheathing, flush with sheathing corner
 - 3. Provide factory corner parts with DFSP splices installed at both ends to receive corresponding parts at butt joints

4. Seal inside corners with sealant at all openings, including windows and doors, make waterproof.
- H. DFSP:
1. Provide splices when joining two pieces of "Diamond Furr" Weep or J-Stop products together at butt joints
 2. DFSP fits into the hem of butting parts, splicing two together prior to final fastening by installer
 3. Place splice with equal amount on each side of butt joint
- I. DF-PCC:
1. Factory pre-cut 90 degree corners used to connect DFS series trims
 2. DF-PCC fits into the hem of butting parts, splicing two together prior to final fastening by installer
 3. Place part with a sufficient amount on each side of the butt joint to create a 90 degree angle flashing at corners.
- J. DF-2375:
1. Fasten over gypsum sheathing to vertical framing with galvanized wafer head self-tapping screws
 2. Install plaster slip joints prior to the installation of the DF-2375 furring strips over the vertical framing
- K. DF-375:
1. Fasten as furring and backing components when installing aluminum trim over rigid insulation
 2. See plans for specific trim locations
 3. Attach with 1/2" wafer head self-tapping screw fasteners in conjunction with Diamond Furr DFC metal clips
- L. DFC:
1. Provide Clips attached over furring component (DF-2375) of Diamond Furr products to hold backing for trims.
 2. Wire-tie clips to DF-2375 for horizontal and vertical backing
- M. Insulation:
1. Type: Refer to Section 07 21 00 Insulation

2. Special Sizes:
 - a. Provide rigid insulation from the supplier cut in dimensions similar to spacing between vertical framing, 16" by 8" long; also provide rigid insulation from the supplier cut approximately 1" width by 8' in length stagger all joints
 - b. Fit 1" wide insulation into "Diamond Furr" trim parts between inside part of termination point and furring components (DFS-2375, DF-WD-2375, and DFW-2375)
3. Outside corners: Provide rigid insulation at outside corners with edges on one side bevel cut by supplier at 45 deg. angle for ease of installation and minimizing field cuts to the insulation.
4. Spray Foam Insulation: Provide rigid insulation manufacturer approved spray foam insulation to fill in any gaps occurring during installation of rigid insulation 1/8" or greater prior to lath being installed. Follow manufacturer's instructions for flashing joints and penetrations.
5. Tape insulation Joints and clip penetrations with Rmax R-Seal 3000.

3.5 INSTALLING METAL LATH

- A. General: Install according to ASTM C 1063.
- B. Attach lath over rigid insulation:
 1. Metal lath shall be attached with 18 gauge galvanized wire in a butterfly style tie, a minimum of every 6.5" to all Diamond Furr trim and furring strip products.
 2. Metal lath shall be broken around all reveals or slip joints in such a way as to accommodate the parts and Diamond Furr attachment components (DF-375).
 3. Metal lath shall not be mechanically attached to reveals or slip joints.
- C. Ceiling and Horizontal Framing: Install furring, paper-backed, diamond-mesh lath.

3.6 INSTALLING ACCESSORIES

- A. Install according to ASTM C 1063 and at locations indicated on Drawings.
- B. Reinforcement for External Corners
 1. Install lath-type, external-corner reinforcement at exterior locations.
 2. Install cornerbead at exterior locations.
- C. Control Joints: Install control joints at locations indicated on Drawings, and as follows:
 1. As required to delineate plasterwork into areas (panels) of the following maximum sizes
 - a. Vertical Surfaces: 144 sq. ft.

- b. Horizontal and other Nonvertical Surfaces: 100 sq. ft.
- 2. At distances between control joints of not greater than 16 feet o.c.
- 3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
- 4. Where control joints occur in surface of construction directly behind plaster.
- 5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.7 PLASTER APPLICATION

- A. Two-Coat Plaster system (base and finish) not permitted.
- B. General: Comply with ASTM C 926.
 - 1. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.
 - 2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
 - 3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.
- C. Bonding Compound: Apply on concrete plaster bases.
- D. Walls; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork; 3/4-inch thickness.
 - 1. Portland and plastic cement mixes.
- E. Walls; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork, on concrete; 3/4-inch thickness.
 - 1. Portland and masonry cement mixes.
- F. Ceilings; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork; 1/2 inch thick.
 - 1. Portland and plastic cement mixes.
- G. Acrylic-Based Finish Coatings: Apply coating system, including primers, finish coats, and sealing topcoats, according to manufacturer's written instructions.

3.8 PLASTER REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.9 PROTECTION

- A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Gypsum Board Panels.
- B. Vertical wall gypsum board application.
- C. Taped and sanded joint treatment.
- D. Metal channel ceiling framing and horizontal ceiling gypsum board application.
- E. Exterior gypsum sheathing board.
- F. Glass Mat Water-Resistant Backing Board for ceramic tile application.
- G. Related Sections
 - 1. Section 01 35 42, CALGreen Requirements.
 - 2. Section 05 40 00, Cold-Formed Metal Framing.
 - 3. Section 09 22 16, Non-Structural Metal Framing.
 - 4. Section 09 24 00, Portland Cement Plaster.
 - 5. Section 09 90 00, Painting

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM C475 - Joint Compound and Joint Tape for Finishing Gypsum Board.
 - 2. ASTM C645 - Specification for Nonstructural Steel Framing Members.
 - 3. ASTM C754 - Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - 4. ASTM C840 - Application and Finishing of Gypsum Board.
 - 5. ASTM C954 - Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. to 0.112 in. in thickness.
 - 6. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
 - 7. ASTM C1177 - Glass Mat Gypsum Substrate for Use as Sheathing.
 - 8. ASTM C1178 - Glass Mat Water-Resistant Gypsum Backing Panel.

- 9. ASTM C1396 - Specification for Gypsum Board.
- C. Underwriters Laboratories, Inc. (UL)
 - 1. UL Directory - Fire Resistance Directory, Volume 1, Latest Edition.
- D. Gypsum Association (GA)
 - 1. GA-201 - Gypsum Board for Walls and Ceilings
 - 2. GA-214 - Levels of Gypsum Board Finish
 - 3. GA-216 - Application and Finishing of Gypsum Board
 - 4. GA-600 - Fire Resistance Design Manual
 - 5. GA-226 - Gypsum Board installation on Curved Walls.
- E. 2022 California Building Code (CBC)
 - 1. CBC-7 - Chapter 7, Fire Resistant Materials and Construction
 - 2. CBC-19A - Chapter 19A, Concrete (for DSA)
 - 3. CBC-25 - Chapter 25, Gypsum Board and Plaster.
- F. California Green Building Standards Code, CALGreen - 2022.
- G. Division of the State Architect, Interpretation of Regulations (DSA-IR)
 - 1. DSA-IR 25-3, Drywall Ceiling Suspension Conventional Construction- One Layer.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other units of Work.
- C. Samples: For following products:
 - 1. Trim Accessories: Full-size sample in 12-inch-long length for each trim accessory indicated.
 - 2. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.
- D. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code, per paragraph 1.04.B this Section.

1.4 QUALITY ASSURANCE

- A. Applicator: Company specializing in gypsum board systems work with three years' experience.

- B. California Green Building Standards Code, CALGreen - 2022.
 - 1. Adhesives, sealants, primers and caulks shall comply with air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, per CALGreen Tables 5.504.4.1 and 5.504.4.2.
 - 2. Paints and Coatings shall comply with VOC limits in Table 1 of the ARB, per CALGreen Table 5.504.4.3
 - 3. Composite wood products (plywood, particle board, medium density fiberboard) shall comply with Formaldehyde limits per CALGreen Table 5.504.4.5.
 - 4. Recycled Content per CALGreen Section A5.405.4.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.
- C. Steel Framing and related accessories shall be stored and handled in accordance with AISI Code of Standard Practice.

1.6 WARRANTY

- A. Provide manufacturer's warranty, 3 years against manufacturing defects.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of following manufacturer form basis for design and quality intended:
 - 1. United States Gypsum Corporation (USG), Chicago, IL.
- B. Subject to compliance with requirements, other acceptable manufacturers include the following:
 - 1. Georgia-Pacific, Atlanta, GA.
 - 2. National Gypsum Co./Gold Bond Building Products, Charlotte, NC.
 - 3. Pabco Gypsum, Rancho Cordova, CA.
 - 4. CertainTeed Corporation, Valley Forge, PA.
 - 5. Temple-Inland Forest Products, Diboll, TX.

- C. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.2 BOARD MATERIALS

- A. Regular Gypsum Board: ASTM C1396; 5/8 inch thick, maximum permissible length; ends square cut, tapered round edges, USG SHEETROCK BRAND TAPERED GYPSUM PANELS SW.
- B. Fire-rated Gypsum Board, 1HR: ASTM C1396; Type X, fire resistive type, 5/8 inch thick, maximum permissible length; ends square cut, tapered round edges, USG SHEETROCK BRAND FIRECODE, or equal.
- C. Exterior Gypsum Sheathing Board System: ASTM C1177; moisture resistant, and fire resistant, Type X, 5/8 inch thick, maximum permissible length, ends square cut, inorganic glass fiber mat faced, 48 inch width, DensGlass Exterior Sheathing by Georgia Pacific, USG Securock Glass-Mat, Gold Bond e2XP by National Gypsum, GlasRoc Brand Sheathing by BPB America or equal.
1. Install Water Resistive Barrier at exterior wall over sheathing substrate. Tyvek CommercialWrap by DuPont, Typar Metro Wrap or equal.
 2. For parapet wall in fire-resistive construction: Parapet Wall Paneling, Fire-Resistive Buildings: Exterior fire-resistive gypsum board 5/8 inches Dens Deck Prime Fireguard Roof Boards by Georgia-Pacific, ASTM C1177.
- D. High Performance (Glass Mat) Water-Resistant Tile Backing Board: ASTM C1178, ASTM D3273, 5/8 inch thick Fireguard Type X, and 1/2 inch thick for non-rated walls. Glass mats on front and back, applied acrylic coating on front side, Dens-Shield Tile Backer by Georgia-Pacific, Atlanta GA, USG Fiberock Mold Tough VHI Exterior Sheathing or equal.
- E. Paperless, Mold-Resistant Soundproof Gypsum Board: ASTM D3273, ASTM C1396
1. Manufacturer: Quite Solution, Inc., QuietRock 530, or equal, thickness: 5/8 inches, Type X; Weight: 2.8 pounds per square foot; Edges: Tapered.
 2. STC-rated: 52-74 (ASTM E90)
 3. Surfacing: Coated fiberglass mat on face and back.
 4. Fire-rated: 1 hour
 5. Surface flame: Class A (ASTM E84)
 6. Water absorption: less than 5 percent (percent of weight)
 7. R value: 0.38

2.3 MATERIALS

- A. Furring Channels: 25 gauge galvanized steel, 7/8 inch deep by 2-9/16 inch wide hat channels, 275 pounds per 1,000 feet weight, FHC-25 and CEMCO METAL FURRING

CHANNEL CLIPS. Z Type, where required: CEMCO Z-FURRING CHANNEL, 1", 1-1/2", 2" and 3" depths.

1. Dietrich UltraSteel Framing, 25 gauge or equal.
- B. Angles: 1-3/8 inch by 7/8 inch, 24 gauge, Dietrich Metal Framing, CEMCO GALVANIZED METAL ANGLES or equal.
- C. Runner Channels: Minimum weights, sizes and maximum spans conform to reference standard listed in Table 2506.2 California Building Code, 1-1/2", 1.12 lbs/foot, hot-rolled channels as defined therein.
- D. Hanger Wire: 8 gauge for 16 square feet maximum, galvanized annealed, size of wire in accordance with reference standard listed Table 2506.2, California Building Code.
- E. Tie Wire: 18 gauge galvanized annealed.
- F. Taping, Bedding and Finishing Compound: ASTM C475; compatible with tape and substrate.
 1. USG SHEETROCK Brand Taping Joint Compound Ready-Mixed, drying-type, non-asbestos, vinyl base.
 2. USG SHEETROCK Brand Topping Joint Compound Ready-Mixed, drying-type non-asbestos, vinyl base.
 3. USG SHEETROCK Powder Joint Compound, drying-type, non-asbestos vinyl base, conventionally drying. For Taping and Topping.
 4. USG SHEETROCK Powder Setting-type Joint Compound, chemical hardening.
 5. Contractor's Option: USG SHEETROCK Lightweight All Purpose Joint Compound (Plus 3) with Dust Control.
 6. USG SHEETROCK Brand All Purpose Joint Compound Ready-Mixed for laminating gypsum panels in multilayer partitions.
 7. USG SHEETROCK Brand Joint Tape-Heavy, ASTM C475, high strength cross-fibered paper tape.
 8. Drywall Primers: USG First Coat.
 9. Or equal as approved in accordance with Division 01, General Requirements for substitutions.
- G. Accessories: Corrosive Protective-Coated steel.
 1. U-Trims: USG, Dietrich No. 200-A for joint compound or equal. .
 2. J-Trim Casings, reveal type: USG, Dietrich No. 401 for 1/2" panels, 402 for 5/8" panels, no finishing compound.
 3. Control Joint: Dietrich 093, USG Control Joint No. 093, Zinc metal.

4. Corner Bead: USG, Dietrich No. 103 for joint compounds or equal. .
- H. Fasteners: Self-drilling tapping screws shall comply ASTM C 954; Self piercing screws shall comply ASTM C 1002;
 1. ASTM C1002, No. 2 Phillips recessed, bugle head, power-driven. Nails not permitted.
 2. Type S-12, ASTM C954, 16 gage steel studs, minimum penetration 3/8 inch.
 3. Type S, ASTM C 1002, 20 gage steel studs, minimum penetration 3/8 inch.
 4. Type G, gypsum board to gypsum board, minimum penetration 1/2 inch.
 5. Type W, wood construction, minimum penetration 5/8 inch. I. 2 3
- I. Reveal Moldings: Extruded aluminum moldings as detailed and as manufactured by Fry Reglet Co., Alhambra, CA, or equal as approved in accordance with Division 01, General Requirements for substitutions. All intersections shall be factory fabricated with joints heliarc welded and backs sealed with permanent waterproof tape. Furnish with 6 inch legs to join with straight sections. Provide connector clips at butt joints of straight sections and end caps at terminations. Color as selected by Architect.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Fry Reglet Corp.
 - b. Gordon, Inc.
 - c. MM Systems Corporation.
 - d. Pittcon Industries.
 2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, alloy 6063-T5.
 3. Finish: Anodized finish, Class II medium etch 0.40 mils, AA-M12C22A31, clear anodized

2.4 TEXTURE FINISHES

- A. USG Spray Texture Finish: smooth finish.
- B. Primer as recommended by texture finish manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that site conditions are ready to receive Work.
- B. Beginning installation means acceptance of substrate.

3.2 PREPARATION

- A. Delivery and Storage: Arrange for an adequate supply of materials on the jobsite so that progress of Work will be uninterrupted. Materials and accessories shall be delivered in original containers and bundles, and identified with the manufacturer's name and brand. Store gypsum board on flat, solid supports in dry areas, well protected from the elements.
- B. Provide fixtures, anchors, sleeves, inserts and miscellaneous items, and provide openings and chases as necessary. Prior to closing in and finishing of dry wall Work, ascertain that piping, conduit, ductwork and fixtures which are to be concealed and which penetrate gypsum boards are in place, tested and approved.
- C. Scaffolding: Construct, erect and maintain in conformance with applicable laws and ordinances.
- D. Protection, Patching and Cleaning: Adjacent surfaces of other materials shall be protected from damage. Dry wall surfaces that have been cut out shall be neatly patched. Damaged or defective gypsum board finish shall be replaced. During progress of Work, rubbish droppings and water materials shall be removed.
- E. Fire Protection: Where required, the Work shall comply with the requirements for the protection rating indicated in the governing building code.
- F. Fire Sprinkler System: In areas where sprinkler heads occur, exercise care when installing drywall work. Do not damage or obstruct the heads in any way.

3.3 CEILING FRAMING INSTALLATION

- A. Framing for suspended ceilings and vertical curtain walls between dropped ceilings: Install to provide plumbed surfaces with no variation of more than 1/4 inch in 10 feet.
- B. Ceilings shall not support material or building components other than grilles light fixtures, small electrical conduits and small ducts.
 - 1. Small Electrical Conduits: 3/4 inch in diameter or less, feeding electrical fixtures or electrical devices in the ceiling assembly.
 - 2. Large duct work, plumbing and like Work shall have its own support system and shall not be attached to the ceiling system.
 - 3. Only gypsum board dead loads shall be supported by cross-furring.
- C. Ceiling Support System: Conform to Section 2504, 2511 and reference standard listed in Table 2506.2, California Building Code and DSA, IR 25-3, for sizes, types and spacing of ceiling support components.
 - 1. Main Runners: 1-1/2 inch, 0.475 pound per foot, cold-rolled channels, designated 150U050-54.
 - 2. Vertical hanger wires are #9 gauge (0.148" dia.) and galvanized conforming to ASTM A641. Soft temper and minimum tensile strength = 70 ksi.

3. Cross-furring may be 7/8 inch hat sections, designated 087F125, 25 gauge galvanized hat sections at 24 inches maximum on centers.
 4. Main runners, spaced at 3 feet on centers, hanger wires shall be spaced at 4 feet maximum. To use hanger spacing of 4 feet on centers with a main runner spacing of 4 feet on centers, main runners shall be 1-1/2 inch hot-rolled channels weighing 1.12 pounds per foot.
- D. Spacing of both hangers and runners: 48 by 48 inches is permissible if following conditions are met:
1. Vertical hanger wires are 8 gauge and galvanized. If ceiling is non-accessible, 12 gauge wire may be used.
 2. Main runners are 1-1/2 inch channels, 1.12 pounds per foot minimum, hot rolled.
 3. Cross-furring may be 7/8 inch, 25 gauge galvanized hat sections at 24 inches maximum on centers.
- E. Hangers: Provide Hanger wires for primary runners within 6 inches from ceiling perimeters.
1. Hanger wires with ends twisted at least 3 times around itself, shall be saddle tied to primary runner channels.
 2. Primary runner channel shall be crossed with furring channels, saddle tied to runners with one strand of 16 gauge or two strands of 18 gauge tie wire. Runner channels shall be located not more than 6 inches from parallel boundary walls, or beams; furring channels 2 inches from parallel walls.
 3. Primary runner channels shall be spliced by lapping 12 inches and furring channels shall be spliced by lapping 8 inches. Splices shall be tied at 2 inches from each end with two loops of 16 gauge wire.
 4. Hanger wires that are more than 1 in 6 out of plumb shall have counterbraced wires. Wires shall not attach or bend around interfering material such as duct work. Trapeze or equivalent devices shall be used where obstructions interfere with direct suspension. Trapeze suspension shall have a minimum construction of back-to-back 1-1/2 inch cold formed channels for spans up to 6 ft.
 5. Ceiling wires and unbraced ducts, pipes and similar components must be separated.
 6. Refer to Division 01, General Requirements for size and testing requirements for concrete expansion anchor bolts and powder actuated fasteners.
 7. Fasten hanger wires with not less than three (3) tight turns. Fasten bracing wires with four (4) tight turns. Make all tight turns within distance of 1-1/2 inches. Hanger or bracing wire anchors to structure should be installed in such manner that direction of wire aligns as closely as possible with direction of forces acting on wire.

- a. Wire turns made by machine where both strands have been deformed or bent in wrapping can waive 1-1/2 inch requirement, but number of turns should be maintained, and be as tight as possible.
 8. Separate all ceiling hanging and bracing wires at least 6 inches from all unbraced ducts, pipes, conduit, it is acceptable to attach lightweight items, such as single electrical conduit not exceeding 3/4 inch nominal diameter, to hanger wires using connectors acceptable to the Division of the State Architect (DSA).
 9. When drilled-in (expansion) concrete anchors or shot-in (Powder-activated) anchors are used in reinforced concrete for hanger wires, 1 out of 10 must be field tested for 200 pounds in tension. When drilled-in anchors are used for bracing wires, 1 out of 2 must be field tested for 440 pounds in tension. Shot-in anchors in concrete are not permitted for bracing wires.
 10. Provide trapeze or other supplementary support members at obstructions to typical hanger spacing. Provide additional hangers, struts or braces as required at all ceiling breaks, soffits or discontinuous areas. Hanger wires that are more than 1 in 6 out of plumb are to have counter-sloping wires.
- F. Horizontal (Lateral) Support System:
1. Set of 4 splay wires shall be provided for each 12 by 12 feet. First set of splay wires shall be 4 feet from any wall. Wires shall be taut without causing ceiling to lift. Provide one vertical compression strut at each set of bracing wires per the following: DSA IR 25-3.
 - a. Up to 48 inches in length: minimum, 4-inch stud, 20 gauge. Attach to main runners within 2 inch of cross runner with 2-#12 self-drilling self-tapping screws and to steel deck structure. At Wood Structure: 2-#12 x 2 inch screws or 3/16 inch diameter expansion anchor at concrete/steel deck. Compression strut shall not replace hanger wire.
 - b. Up to 96 inches in length: back brace 4-inch brace stud with 4-inch stud, 20 gauge, screw perpendicular to center of brace stud with #10 screws at 24 inches on center. Attach to main runners within 2 inch of cross runner with 2-#12 self-drilling self-tapping screws and to steel deck structure. At Wood Structure: 2-#12 x 2 inch screws or 3/16 inch diameter expansion anchor at concrete/steel deck. Compression strut shall not replace hanger wire.
 - c. And as indicated in drawings.
 2. Splay wires shall be No. 12 gauge, with 4 tight turns at each end. Powder actuated fasteners shall not be used for attachment of splay wires to supporting structure.
 3. Slope of splay wires shall not exceed 45 degrees from the plane of the ceiling and shall be taut. Splices in bracing wires are not to be permitted.

4. Ceiling grid members may be attached to not more than two adjacent walls. Ceiling grid members shall be at least 1/2 inch free of other walls. If walls run diagonally to ceiling grid system runners, one end of main and cross runners should be free, and minimum of 1/2 inch clear of wall.
 5. Suspended ceiling systems with an area of 144 square feet or less, and fire rated ceiling systems with area of 96 square feet or less, surrounded by walls that connects directly to structure above, do not require bracing assemblies when attached to at least two adjacent walls.
- G. Light Fixture Support:
1. Recessed or drop-in light fixtures shall be supported directly by main runners or by supplemental framing which is supported by main runners.
 2. Surface mounted fixtures shall be attached to a main runner with a positive clamping device made of minimum 14 gauge metal. Rotational spring catches not allowed.
 3. Light fixtures shall be attached to ceiling to resist horizontal force equal to weight of fixtures.
 4. Install firestopping envelopes around recessed light fixtures and other electrical devices or boxes that exceed 100 sq. inches in 100 sq. ft where required to maintain designated fire rating of ceiling assembly.
- H. Furring Channel Spacing: Furring channels at drywall ceilings shall be spaced at 16 inches on centers maximum.

3.4 GYPSUM BOARD INSTALLATION

- A. Install gypsum board in accordance with ASTM C840, GA 201, GA 216 and Section 2508 California Building Code. Conform to DSA, IR 25-3. Use board types as indicated; if not indicated use board types as follows.
1. Use Type X (fire-rated core) drywall unless indicated otherwise.
 2. Where gypsum wallboard is indicated as base for ceramic tile use board types as follows
 - a. Use Type (moisture resistant) board, except as follows
 - b. At walls to which plumbing fixtures are mounted and portions of adjoining walls within 2'-0" of a plumbing fixture, install fiberglass-mat faced tile backer board to 4'-0" above the finished floor with Type WR, above, moisture and mold resistant gypsum board.
- B. Non-rated: Erect single layer gypsum board parallel or perpendicular on vertical framing, attached to studs and framing members with the specified fasteners spaced at 16" on center with screws and at top and bottom, 12" on center with screws at ceilings. Solid backing not required at joints running perpendicular to studs and framing members for walls.

1. For walls requiring STC 50 or higher, install extra layer of 1/2" gypsum board on one side, unless noted otherwise on wall schedule.
- C. Rated: Erect single or double layer fire-rated gypsum board panels in accordance with Table 705.4, Note a, and Section 708 California Building Code, and GA-600, for one-hour or two hour, fire-rated, non-bearing Fire Walls or Fire Partitions, steel or wood stud construction.
1. Gypsum board panels installed parallel to vertical studs or framing shall be spaced at 8" on center with screws at vertical edges, and 12" on center with screws in field and at top and bottom, and 12" on center with screws at ceilings. Solid backing not required at joints running perpendicular to studs and framing members for walls. Stagger vertical joints 24 inches on centers each side and opposite sides. Where joints are not staggered required minimum 24 inches, solid backing shall be provided. All joints shall be treated except as provided herein.
 2. For walls requiring STC 50 or higher, install extra layer of 1/2" gypsum board on one side, unless noted otherwise on wall schedule.
- D. Treat cut edges and holes in moisture-resistant gypsum board with sealant.
- E. Place control joints consistent with lines of building spaces as indicated or at maximum of 30 ft on centers. At rated walls, provide with fire rated panels same as wall construction.
- F. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.
- G. Seal all cutout and penetrations: For electrical, mechanical, plumbing and structural framing cutouts and penetration at interior surfaces. Per Section 07 92 00 for non-rated wall.
- H. Foil-backed gypsum board shall be applied on the inside of exterior walls.
- I. Install reveal moldings according to manufacturer's recommendations.

3.5 JOINT TREATMENT

- A. Exposed gypsum board in wall areas and ceiling areas shall have joint compound and be taped and sanded per requirements of GA-114 for levels specified and ready for paint.
- B. On installations where two layers of gypsum board are required, only the face layer will require finishing of joints and screwheads.
- C. Gypsum wallboard joints in walls may either be exposed or covered with joint tape and joint compound for the portion of the wall above a suspended ceiling, which is part of a fire resistive floor-ceiling or roof-ceiling assembly, as listed in U.L. Fire Resistive Ratings (BXUV), when the following conditions are met:
1. Vertical joints occur over framing members.

2. Horizontal joints are staggered 24 inches on opposite sides or covered with 6 inch wide strips of gypsum board attached with 1-1/2 inch laminating screws at 8 inches on centers.
 3. Partition is two-ply system with joints staggered 16 inches or 24 inches.
 4. Partition is not part of a smoke or sound control system.
- D. Sound-Rated Partitions: Perimeters and penetrations of sound-rated partitions shall be caulked with acoustical sealant as specified in Section 07 92 00, both sides of partition.
- E. Joints, except where excluded above including internal corners, shall be filled and taped. Thin uniform layer of joint compound, approximately 3 inches wide, shall be applied over joint. Tape shall be set in joint compound and finish levels required below. Internal angles, both horizontal and vertical, shall be reinforced and with tape folded to form straight and true angle. Metal external corners shall be set in place. Joints shall be allowed to dry at least 24 hours between each application of cement.
- F. Gypsum board finish shall be to the following levels as defined by GA-214:
1. All Areas - Level 5 Backroll application of sealer. Level 5 requires one of the following.
 - a. Skim coat: A thin skim coat of joint compound, or a material manufactured especially for this purpose, shall be applied to entire surfaces. Surfaces shall be smooth and free of tool marks and ridges.
 - b. Acrylic latex-based coating, spray apply: USG SHEETROCK Brand Primer-Surfacer Tuf-Hide or ProForm Surfacer/Primer by National Gypsum or equal. Apply to 15-20 mils wet film thickness to entire surface.
 - c. "Smooth Coat" level 5 by Westpac Materials, Orange, CA.
 - d. Additionally apply primer coat per Section 09 90 00 Painting.

3.6 INSTALLATION OF HIGH-PERFORMANCE TILE BACKER

- A. Install panels to framing. Precut board to required sizes and make all cutouts. Butt ends and edges. Cut board to fit by scoring and breaking or by sawing from face side. Install Board horizontally or vertically at non-rated walls, vertically at rated walls as required by UL Design.
- B. Secure to light gauge steel with 1 inch -1-5/8 inch waferhead or buglehead, multilevel thread, sharp point drywall screw (Type S Hi-Lo) and to heavy gauge steel with 1 inch -1-5/8 inch waferhead or buglehead, fine thread, drill point drywall screw (Type S-12). For Wood framing: ASTM C1002, No. 2 Phillips recessed, bugle head, power-driven, Type W, minimum penetration 5/8 inch. Space fasteners 6 inches on centers for walls and ceilings.
- C. For joints and angles in tile areas: Apply 2 inches glass fiber tape over joints. Embed tape in adhesive used to set tile. Allow joints to dry prior to setting tile. Caulk openings with flexible sealant prior to installation of tile.

- D. For installation as finished material (non-tile areas): Embed with 2 inch 10x10 glass mesh tape set with GP Speed Set setting compound or equal. Trowel GP Speed Set (skim coat) over entire Dens-Shield panel to product smooth surface. Prime with alkyd primer before painting.

3.7 EXTERIOR GYPSUM SHEATHING INSTALLATION

- A. Install per manufacturer's instructions.
- B. Erect exterior gypsum sheathing horizontally with edges butted tight and ends occurring over firm bearing. Tack into place sufficiently to hold material until permanent attachment is provided by self-furring lath fasteners for cement plaster application. Install screw pattern per Gypsum Association G216 for vertical application.
- C. Treat joints per manufacturer's system for exterior sheathing.

38 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

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SECTION 09 30 13 – CERAMIC TILE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Ceramic Tile at floors using thin set application method and ceramic tile at walls and base using thinset application method.
- B. Related Sections.
 - 1. Section 09 29 00, Gypsum Board.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. ADA - Americans with Disabilities Act of 1990 as amended
 - 1. ADA Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.
- C. 2022 CALGreen - California Green Building Standards Code
- D. ANSI/TCNA A108.1B - Installation of Ceramic Tile on Cured Portland Cement Mortar Setting Bed with Dry-set or Latex-Portland Cement Mortar.
- E. ANSI/TCNA A108.5 - Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
- F. ANSI/TCNA A108.10 - Installation of Grout in Tile Work.
- G. ANSI/TCNA A118.6 - Cement Grouts for Tile Installation.
- H. ANSI/TCNA A118.1 - Dry-Set Portland Cement Mortar.
- I. ANSI/TCNA A118.4 - Latex-Portland Cement Mortar.
- J. ANSI/TCNA A118.7 - Polymer Modified Tile Grouts for Tile Installation.
- K. ANSI/TCNA A118.10 - Bonded Waterproof Membranes for Thin-set Ceramic Tile and Dimension Stone Installation.
- L. ANSI/TCNA A137.1 - Ceramic Tile.
- M. ASTM A185 - Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
- N. ASTM C144 - Aggregate for Masonry Mortar.
- O. ASTM C150 - Portland Cements,
- P. ASTM C207 - Hydrated Lime for Masonry Purposes.
- Q. ASTM C373 - Water Absorption, Bulk Density, Apparent Porosity and Apparent Specific Gravity of Fired Whiteware Products.
- R. ASTM D1056 - Flexible Cellular Materials.

- S. ASTM C1178 - Coated Glass Mat Water-Resistant Gypsum Backing Panel.
- T. ASTM C171 - Sheet Materials for Curing Concrete.
- U. ASTM C920 - Elastomeric Joint Sealants.
- V. TCNA (Tile Council of North America) - Handbook for Ceramic Tile Installation, Latest Edition.

1.3 SUBMITTALS

- A. Product Data: For each type of tile, bond coat, grout, and other products specified.
- B. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code per 1.04.D.
- C. Shop Drawings: Include following:
 - 1. Tile patterns and locations.
 - 2. Widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- D. Samples for Verification: Of each item listed below, prepared on Samples of size and construction indicated. Where products involve normal color and texture variations, include Sample sets showing full range of variations expected.
 - 1. Each type and composition of tile and for each color and texture required, at least 12 inches square, mounted on braced cementitious backer units, and with grouted joints using product complying with specified requirements and approved for completed work in color or colors selected by Architect.
 - 2. Full-size units of each type of trim and accessory for each color required.
 - 3. Metal edge strips in 6-inch lengths.
- E. Product Certificates: Master Grade Certificate signed by the manufacturer certifying that products furnished comply with requirements of Standard Grade.
- F. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names of architects and owners, and other information specified.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Company specializing in the manufacture of products specified in this Section with minimum five years' experience.

- B. Installer Qualifications: Engage experienced installer who has completed tile installations similar in material, design, and extent to that indicated for this Project and with record of successful in-service performance. Minimum 5 years of documented experience of tile installation.
 - 1. Installer-Tile Layer: Journeyman Level Classification required, recognized by California Directory of Industrial Relations or the U.S. Department of Labor. Certification required or Installer employs Certified Tile Installer (CTI) by the Ceramic Tile Education Foundation (CTEF)
- C. Source Limitations for Tile: Obtain each color, grade, finish, type, composition, and variety of tile from one source with resources to provide products from same production run for each contiguous area of consistent quality in appearance and physical properties without delaying Work.
- D. 2022 CALGreen - California Green Building Standards Code.
 - 1. Adhesives, sealants, primers, and caulks shall comply with air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, per CALGreen Tables 5.504.4.1 and 5.504.4.2.
- E. Source Limitations for Setting and Grouting Materials: Obtain ingredients of uniform quality for each bond coat, and grout component from single manufacturer and each aggregate from one source or producer.
- F. Mockups: Before installing tile, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with following requirements, using materials indicated for completed Work.
 - 1. Locate mockups in location and of size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect 7 days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's approval of mockups before proceeding with final unit of Work.
 - 5. Maintain mockups during construction in undisturbed condition as standard for judging completed Work.
 - a. When directed, demolish and remove mockups from Project site.
- G. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 01, General Requirements.
- H. Tile Adhesives and Joint Sealers: As recommended by the tile manufacturer. Comply with VOC Limits set by.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Company specializing in the manufacture of products specified in this Section with minimum five years' experience.
- B. Installer Qualifications: Engage experienced installer who has completed tile installations similar in material, design, and extent to that indicated for this Project and with record of successful in-service performance. Minimum 5 years of documented experience of tile installation.
 - 1. Installer-Tile Layer: Journeyman Level Classification required, recognized by California Directory of Industrial Relations or the U.S. Department of Labor. Certification required or Installer employs Certified Tile Installer (CTI) by the Ceramic Tile Education Foundation (CTEF)
- C. Source Limitations for Tile: Obtain each color, grade, finish, type, composition, and variety of tile from one source with resources to provide products from same production run for each contiguous area of consistent quality in appearance and physical properties without delaying Work.
- D. 2022 CALGreen - California Green Building Standards Code.
 - 1. Adhesives, sealants, primers, and caulks shall comply with air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, per CALGreen Tables 5.504.4.1 and 5.504.4.2.
- E. Source Limitations for Setting and Grouting Materials: Obtain ingredients of uniform quality for each bond coat, and grout component from single manufacturer and each aggregate from one source or producer.
- F. Mockups: Before installing tile, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with following requirements, using materials indicated for completed Work.
 - 1. Locate mockups in location and of size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect 7 days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's approval of mockups before proceeding with final unit of Work.
 - 5. Maintain mockups during construction in undisturbed condition as standard for judging completed Work.
 - a. When directed, demolish and remove mockups from Project site.

- G. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 01, General Requirements.
- H. Tile Adhesives and Joint Sealers: As recommended by the tile manufacturer. Comply 1.05 DELIVERY, STORAGE AND HANDLING

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site only in cartons which have been grade sealed by manufacturer in accordance with ANSI A137.1 and with grade seals unbroken. Seconds grade seal quality not permitted.
- B. Tiles delivered to job or installed in Work that do not fall within specified standards of quality or accepted color range shall be removed from jobsite and properly be replaced with acceptable material.
- C. Store and protect products in dry, secure areas.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install volatile materials in a closed, unventilated environment.
- B. Maintain 50 degrees F or above during installation of adhesive and grout materials.
- C. Shade work from direct sunlight during tile installation as needed to prevent rapid evaporation caused by excessive heat.

1.7 MAINTENANCE

- A. Extra Materials
 - 1. Extra Materials shall be from same production run as installed materials.
 - 2. Wrap or crate for storage and label for contents and dates and locations of related installations.
 - 3. Deliver Extra Materials to Site as directed by Owner.
 - 4. Tile. For each type, size and color or finish of tile provide, as extra materials, a quantity equal to approximately 2-percent of the quantity required for its installation; round quantity up to next higher full carton.
 - 5. Special Shapes. For each type, size and color or finish of special shaped tile required, provide, as extra materials, a quantity equal to the following.
 - a. Coved Base: 10-linear-feet
 - b. Formed Coved Base Corners: 6 pieces, each inside and outside
 - c. Bullnose Tile: 15-linear feet
 - d. Bullnose Corner: 6 pieces

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of following manufacturers form basis for design and quality intended.

1. Dal-Tile, Corona, CA./American Olean Tile, City of Industry, CA.
- B. Substitutions as approved in accordance with Division 01. General Requirements for substitutions.

2.2 TILE

- A. Ceramic Mosaic Floor Tile: ANSI/TCA A137.1, conforming to following: with VOC Limits set by
 1. Moisture Absorption: 0 to 0.5 percent, (impervious) ASTM C373
 2. Size: as indicated on drawings
 3. Surface Finish: as indicated on drawings
 4. Colors: as indicated on drawings
 5. Patterns: Per Architectural Drawings.
 6. Slip Resistant: Ceramic Tile flooring shall be stable, firm, and slip resistant. CBC Section 11B-302.1.
- B. Ceramic Wall Tile: ANSI/TCA A137.1, conforming to following:
 1. Moisture Absorption: As permitted by ANSI A137.1.
 2. Size: as indicated on drawings
 3. Surface Finish: as indicated on drawings
 4. Colors: as indicated on drawings
 5. Patterns: Per Architectural Drawings.
- C. Slip Resistant: Ceramic Tile flooring shall be stable, firm, and slip resistant. CBC Section 11B-302.1.
- D. Base: Match wall tile for moisture absorption, surface finish and color, coved bottom and as specified on drawings. Where no wall tile is installed, match floor tile, 6" high.
- E. Wainscot Cap: Match wall tile for moisture absorption, surface finish and color, bullnosed top edge. Coordinate sizes and coursing of adjoining tile.
- F. Corners: coved at inside corners and bullnose at exterior corners.
- G. Colors and Patterns: as indicated on drawings

2.3 SETTING MATERIALS

- A. Manufacturers:
 1. Bostik Inc: www.bostik-us.com.
 2. Custom Building Products: www.custombuildingproducts.com.
 3. LATICRETE International, Inc: www.laticrete.com.

4. Mapei Corporation: www.mapei.com.
 5. Merkrete, by Parex USA, Inc: www.merkrete.com.
 6. TEC, an H.B. Fuller Construction Products Brand: www.tecspecialty.com/#sle.
 7. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Interior adhesives, sealants, primers and sealants used as filler must meet the requirements of low emitting materials. Conform to 1 and 2.
- C. Epoxy Adhesive and Mortar Bond Coat: 1 and 2.
1. Applications: Where indicated on drawings.
 2. Products:
 - a. Custom Building Products; EBM-Lite Epoxy Bonding Mortar: www.custombuildingproducts.com/#sle.
 - b. LATICRETE International, Inc; LATICRETE LATAPOXY 300 Adhesive: www.laticrete.com/#sle.
 - c. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Dry-Set Portland Cement Mortar Bond Coat: 1 and 2, Zero-volatile organic compound (VOC)content.
1. Products:
 - a. Custom Building Products: www.custombuildingproducts.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.
1. Products:
 - a. Custom Building Products; ProLite Tile & Stone Mortar: www.custombuildingproducts.com.
 - b. LATICRETE International, Inc: www.laticrete.com/#sle.
 - c. Merkrete, by Parex USA, Inc: www.merkrete.com/#sle.
 - d. Proflex Products, Inc: www.proflex.us/#sle.e. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 GROUT

- A. Grout: ANSI/TCNA A118.3, chemical-resistant type consisting of epoxy resin and hardener. Manufacturers:
1. Custom Building Products. Product: Epoxy Grout.
 2. Refer to Finish Schedule on Drawings.
 3. Or equal in accordance with Division 01, General Requirements for Substitutions. Colors as selected by Architect.

2.5 ACCESSORIES

- A. Curing Paper: Kraft paper conforming to ASTM C171.
- B. Grout Sealer for Walls and Floors, epoxy-based grouts.
 - 1. Pro Spec Grout Sealer (acrylic), by Bonsai American Co, Charlotte, NC.
 - 2. Grout Armor Color Sealer (acrylic), by Grout Armor, Fort Lauderdale, FL
 - 3. Acrylic Grout Sealer (acrylic), by Glaze 'N Seal.
 - 4. MicroGuard AD708 (Silane), by Adsil, Palm Coast, FL.
 - 5. Silox 8 (Silane), by Bostik, Middleton, MA.
 - 6. Or equal and as recommended by grout manufacturer.
- C. Edge Strips, Coves:
 - 1. Angle, L-shape, reducers, or T-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically, for flooring applications.
 - 2. Acceptable manufacturer: Schluter Systems or approved equivalent.
 - 3. Edge Strip - Floors: Schluter-Reno Series and Schluter-Schiene Series . Size for tile materials specified.
 - 4. Cove Base: Schluter-DILEX-AHK; anodized aluminum, trapezoid-perforated anchoring leg, 3/8" radius. Thickness per tile specified.
 - 5. Edge Strip - Walls: Schluter-JOLLY edge-protection profile for the outside corners. Size for tile materials specified.
 - 6. Material: Satin Anodized Aluminum (AE).
 - 7. Colors, sized: Refer to Drawings.
- D. Corner Trims: Aluminum
 - 1. Manufacturer: Profillitec
 - 2. Product: Mosaictec RJF, Invisible Aluminum profile for mosaic.
 - 3. Finish: Silver Anodized aluminum.
- I. High Performance (Glass Mat) Water-Resistant Tile Backing Board: Refer to Section 09 29 00.

2.6 EXPANSION JOINT MATERIALS

- A. Joint Sealer: ASTM C920
 - 1. Vertical Joints: One part silicone sealant, non-sag, elongation movements 25/25 percent, Shore A, hardness range 20 -27, Pecora 890FTS and 890FTS-TXTR.

2. Horizontal Joints: Polyurethane joint sealant; ASTM C 920, Type M, Grade NS, Class 25, Use T, M, A and O. Pecora DynaTred or equal.
 3. Color: to match grout color.
- B. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
 - C. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
 - D. Joint Backing: ASTM D1056; round, closed cell polyethylene foam rod; oversized 25 percent larger than joint width; Backer Rod Mfg. DENVER FOAM or Nomaco Green rod.
 - E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application. Apply to bottom of joints that are too shallow to receive foam backer rod.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work. Verify types of materials that may have been in contact with surfaces.
- B. Beginning of installation means installer accepts condition of existing substrate.
- C. Verify waterproof paper and Backer Units have been installed per Section 09 29 00 for thin set application on walls.

3.2 PREPARATION

- A. Protect surrounding work from damage or disfiguration.
- B. Vacuum clean existing substrate and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.3 MIXING BOND COAT

- A. Use brand of prepackaged dry mix specified by manufacturer.
- B. Mixing: Mix dry set Portland-cement bond coat or latex Portland-cement bond {epoxy bond} coat in accordance with manufacturer's instructions.
- C. Proper bond coat consistency is such that when applied with recommended notched trowel to backing, ridges formed in bond coat will not flow or slump.
- D. During use, remix mortar occasionally. Additional water or fresh materials shall not be added after initial mixing. Mortar shall not be used after initial set.

3.4 INSTALLATION: THIN SET AT FLOORS

- A. FLOORS: Install in accordance with TCNA Handbook for Ceramic and ANSI A108.5 and A118.1. Tile Installation for thin-set application;
- D. Thickness of Setting Bed: Approximately 2 inches nominal.
 - 1. Thickness of setting bed at slope to drains: High point shall be not less than 2 inches not more than 9 inches below top of finished dam and shall have a minimum of 1/4 inch per foot pitch toward drain.
- E. Firmly tamp setting bed to levels required.
- F. Allow setting bed to cure in accordance with ANSI/TCNA A108.1.

3.5 INSTALLATION: THIN SET AT WALLS.

- A. Walls: Install in accordance with TCNA Handbook for Ceramic and ANSI A108.5 and A118.1. Tile Installation for thin-set application:
 - 1. No. W245 for Coated Glass Mat Water-Resistant Gypsum Backing Panel. ASTM C1178, Georgia Pacific Dens-Shield Tile or equal.
- B. Align wall tile grout with floor tile grout.

3.6 BOND COAT APPLICATION

- A. Clean surface thoroughly. Dampen if very dry, but do not saturate.
- B. Apply bond coat with flat side of trowel over an area no greater than covered with tile while bond coat remains plastic.
- C. Within ten minutes before applying tile and using a notched trowel of type recommended by bond coat manufacturer, comb bond coat obtain even setting bed without scraping backing material.
- D. Cover surface uniformly with no bare spot, with sufficient bond coat to ensure a minimum bond coat thickness of 3/32 inch between tile and backing after tile has been beaten into place. Tile shall not be applied to skinned-over bond coat.

3.7 INSTALLATION OF TILE

- A. Do not soak tile.
- B. Set tile firmly on bond coat over substrate surfaces with minimum of 95 percent coverage at floors and wet areas. Back-butter ribbed tiles and other tiles in accordance with ANSI/TCNA 108.5. Spacers on tile determine joint width between tile. Strings or pegs may be used to space tile that have no spacers. Bring all surfaces to a true plane at proper position or elevation. Thoroughly beat-in all tile with a beating block while bond coat is still plastic. Beating shall fill minimum of 95 percent of entire space between units and setting bed. 80 percent coverage is permitted for walls in non-wet areas.

- C. Lay tile to pattern indicated on Drawings or request tile pattern from Architect. Do not interrupt tile pattern through openings.
- D. Place edge strips at exposed tile edges.
- E. Cut and fit tile tight to penetrations through tile. Align floor, base and wall joints where floor tiles and wall tiles are same width.
- F. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight without voids, cracks, excess setting bed mix or excess grout. All inside corners shall be coved and exterior corners shall be bullnose. No butted 90 degree intersections permitted. All outside corners shall be bullnose. All tile edges and terminations shall have bullnose unless noted otherwise.
- G. Sound tile after setting. Replace hollow sounding units.
- H. Keep expansion or control joints free of setting bed mix or grout. Apply sealant to joints.
- I. Allow tile to set for a minimum of 16 hours prior to grouting.
- J. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
- K. If tile is face-mounted, remove paper within one hour after tile is set and adjust all tiles that are out of line or level. Use no more water than necessary in removing paper.
- L. Align wall tile grout with floor tile grout.

3.8 INSTALLATION OF GROUT

- A. Remove bond coat from face and edges of tile.
- B. Mixing: Refer to manufacturer's directions.
- C. Dry blend contents of an entire container of grout prior to mixing with water or latex.
- D. Use caution to prevent scratching or damaging tile surfaces.
- E. Dampen dry joints prior to grouting. Do not leave puddles of water in joints before grouting.
- F. Force maximum amount of grout into joints. Cushion edge tile shall be finished evenly to depth of cushion. Square-edge tile shall be finished flush with surface. Finished joint shall be uniform in color, smooth and without pinholes, voids or low spots.
- G. Grout width: 1/8" unless noted otherwise on drawings.

3.9 CURING

- A. Damp-Cure grout for a minimum of 72 hours. Remove and replace improperly cured grout.
 - 1. with 40-pound kraft paper.

2. Polyethylene curing membrane not permitted.

3.10 EXPANSION JOINTS

- A. Install expansion joints over any construction (cold joint), contraction joint, expansion joint, at juncture of floors and walls, changes in material at other restraining surfaces such as curbs, columns, bases, and wall corners and where recommended by TCNA EJ171A for mortar bed tile or EJ171F for thin set tile.
- B. Expansion joint shall penetrate full depth of setting bed.
- C. Do not damage waterproofing membrane.
- D. Install sealant in accordance with manufacturer's instructions, using hand pointing tools.
- E. Measure joint dimensions and size materials to achieve required width/depth ratios. Minimum width: 3/8 inch.
- F. Install joint backing to achieve a neck dimension no greater than 1/3 joint width. Concrete shall be fully cured.
- G. Install bond breaker where joint backing is not used. Install removable masking material to maintain clean lines and protect adjoining surfaces.
- H. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges. Do not install sealant on wet or damp surfaces.
- I. Install sealant free of air pockets, foreign embedded matter, ridges and sags.
- J. Tool joints concave, channel shaped or as detailed. Use slicking agent type recommended by manufacturer.

3.11 EDGE STRIP

- A. Install according to manufacturer's recommended procedures.

3.12 CLEANING

- A. Clean tile work and adjacent surfaces.

3.13 PROTECTION

- A. Protect finished installation.
- B. Do not permit traffic over finished floor surface.

END OF SECTION

SECTION 09 65 13 - RESILIENT BASE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Resilient base, rubber.
- B. Accessories.
- C. Related Sections
 - 1. Section 01 35 42, CALGreen Requirements.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. ASTM E648 and NFPA 253 - Critical Radiant Flux of Floor Covering Systems.
- C. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- D. ASTM F1861 - Resilient Wall Base
- E. SCAQMD - South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications
- F. California Green Building Standards Code, CALGreen - 2022.

1.3 FIRE CLASSIFICATION REQUIREMENTS

- A. ASTM E648, NFPA 253: Class 1, Critical Radiant Flux Flame Spread Value: minimum 0.45 watts per sq cm.
- B. ASTM E662, smoke density less than 450.

1.4 SUBMITTALS

- A. Product data on specified products and colors available.
- B. Three 6 inch long samples of base material for each color selected.
- C. Manufacturer's installation instructions.
- D. Maintenance procedures and recommended maintenance materials.
- E. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code per 1.05.A.

1.5 QUALITY ASSURANCE

- A. California Green Building Standards Code, CALGreen - 2022.

1. Adhesives, sealants, primers and caulks shall comply with air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, per CALGreen Tables 5.504.4.1 and 5.504.4.2.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Store materials for three days prior to installation in area of installation to achieve temperature stability.
- B. Maintain minimum 70 degrees F temperature three days prior to, during and 24 hours after installation of materials.
- C. Provide adequate ventilation to carry off volatile fumes.

1.7 WARRANTY

- A. Submit under provisions of Division 01, General Requirements.
- B. Provide manufacturer's 1 year warranty against defects and wear-through.

1.8 REPLACEMENT MATERIALS

- A. Provide minimum three percent of all materials furnished for each color and size of materials installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, RUBBER

- A. Roppe Corp., Fostoria, OH.
- B. Burke Mercer Flooring Products, San Jose, CA.
- C. Nora Flooring Systems, Lawrence, MA.
- D. Endura Co., Waltham, MA.
- E. Johnsonite, Chagrin Falls, OH.
- F. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.2 BASE MATERIALS

- A. Base: Rubber, 1/8 inch gauge, standard toe unless noted otherwise, 4 inches. Base material shall meet ASTM F1861 Type TS for rubber base, Group 1, Style A Straight (toeless) profile for carpet and Style B Coved profile for hard surface floors .
- B. Base Accessories: size and color as base.
- C. Adhesive: As recommended by the manufacturer and if full compliance with the California VOC regulations.
- D. Non-aerosol adhesives applied on-site shall comply with VOC content limits defined by SCAQMD Rule 1168. Aerosol adhesives shall comply with VOC contents limits by Green Seal Standard GS-36.

- E. Colors: Refer to drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft and are ready to receive Work.
- B. Verify that surfaces are finished, ready to receive base installation.
- C. Beginning of installation means acceptance of existing substrate and site conditions.

3.2 INSTALLATION - BASE MATERIAL

- A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.
- B. At 90 degree external corners: Cut from 120 foot rolls only, do not use 4 foot segments. At corners more or less than 90 degrees, shave a vertical strip down the back side of the material, 1/4 inch wide and not more than 1/2 the thickness at the point of bend. Bend coved toe to required angle. Bond material firmly to wall on both sides of joint to ensure a tight fit with no open void at top.
- C. Inside Corners: Cut an inverted V-shaped notch in the toe of the wall base at the place where the corner is to be formed. Bend the base once or twice at a right angle to shape the corner. Form the corner and check the fit. Apply adhesive completely to the back of the base and to the wall area to be covered by the corner. Press firmly in position on and roll with a small hand roller.
- D. Pre-molded units will not be accepted.
- E. Install base on solid backing. Bond tight to wall and floor surfaces.
- F. Scribe and fit to door frames and other interruptions.

3.3 CLEANING

- A. Remove excess adhesive from floor, base and wall surfaces without damage.
- B. Protection: Protect work until completion. Repair or make good any damage to this work and other materials damaged during installation of base material.

3.4 SCHEDULE

- A. Install at all walls not specified to receive integral base and as scheduled in the finish schedule.
- B. Do not apply base to toe kick at casework.

END OF SECTION

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SECTION 09 67 00 - FLUID-APPLIED FLOORING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fluid-applied flooring and base.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 07 92 00 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.3 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design.
- B. ANSI/ESD STM7.1 - The Protection of Electrostatic Discharge Susceptible Items Flooring Systems Resistive Characterization.
- C. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
- D. CBC Ch. 11B - California Building Code-Chapter 11B.
- E. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.

1.4 SUBMITTALS

- A. See Section 01 33 00 - Submittal Procedures for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
- C. Samples: Submit two samples, 8 by 8 inch in size illustrating color and pattern for each floor material for each color specified.
- D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and application rate for each coat.
- F. Manufacturer's Qualification Statement.
- G. Applicator's Qualification Statement.
- H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.
- I. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

2. Extra Top Coat Materials: 2 gallons (8 liters).

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section.
 1. Minimum three years of documented experience.
 2. Approved by manufacturer.
- C. Supervisor Qualifications: Trained by product manufacturer.

1.6 MOCK-UP

- A. Construct mock-up(s) of fluid applied flooring to serve as basis for evaluation of texture and workmanship.
 1. Number of Mock-Ups to be Prepared: One.
 2. Use same materials and methods for use in the work.
 3. Use approved design samples as basis for mock-ups.
 4. Locate where directed.
 5. Minimum Size: 48 inches by 48 inches (1220 mm by 1220 mm).
- B. Obtain approval of mock-up by Architect before proceeding with work.
- C. Approved mock-up may remain as part of the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store resin materials in a dry, secure area.
- B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.8 FIELD CONDITIONS

- A. Maintain minimum temperature in storage area of 55 degrees F (13 degrees C).
- B. Store materials in area of installation for minimum period of 24 hours prior to installation.
- C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. All products used Must comply with VOC requirements listed in Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Requirements for Physically Disabled: Provide flooring meeting slip-resistant requirements of California Code of Regulations (CCR), Title 24, Part 2, CBC Ch. 11B and ADA Standards, latest amendment.
 1. Flooring surface shall be stable, firm, and slip resistant. CBC Section 11B-302.1 General.

2. Flooring Surface shall demonstrate a dynamic coefficient of friction of at least 0.42 per DCOF AcuTest ANSI 137.1 Section 9.6 and ANSI B101.3 (using a BOT-3000 testing unit) will be accepted as meeting the intent of slip resistance; CBC 11B-302 Floor or Ground Surfaces and ADA Standards.
 - a. Ramp surface: Provide DCOF value of 0.46.

2.2 MANUFACTURERS

- A. Basis of Design Product: StonClad UTS as manufactured by StonHard, or approved equal.
- B. Fluid-Applied Flooring:
 1. Sika Corporation: www.sikafloorusa.com.
 2. Stonhard, an RPM Company: www.stonhard.com.
 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 FLUID-APPLIED FLOORING SYSTEMS

- A. Fluid-Applied Flooring: Epoxy base coat(s) with embedded quartz aggregate.
 1. Aggregate: Quartz granules.
 2. Top Coat: Polyurethane.
 3. System Thickness: 1/8 inch (3.2 mm), nominal, dry film thickness (DFT).
 4. Texture: Smooth.
 5. Sheen: Matte.
 6. Flammability (ASTM D635): Self-Extinguishing.
 7. Color: As selected by Architect.
 8. Basis of Design Product: Stonshield HRI as manufactured by Stonhard, or approved equal.
- B. Fluid-Applied Flooring: Polyurethane mortar base coat(s) with broadcast aggregate.
 1. Aggregate: Vinyl flakes.
 2. System Thickness: 1/4 inch (6.4 mm), nominal, dry film thickness (DFT).
 3. Texture: Slip resistant.
 4. Sheen: High gloss.
 5. Color: As selected by Architect.
 6. Basis of Design Product: Stonshield UTS as manufactured by Stonhard, or approved equal.

2.4 ACCESSORIES

- A. Fillet Strips: Molded of flooring resin material.
- B. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.
- C. Primer: Type recommended by fluid-applied flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive flooring.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for fluid-applied flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test in accordance with Section 09 05 61.
 - 2. Obtain instructions if test results are not within limits recommended by fluid-applied flooring manufacturer.
 - 3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.
- E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- B. Prepare concrete surfaces according to ICRI 310.2R, CSP 3.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
- D. Vacuum clean substrate.
- E. Apply primer to surfaces required by flooring manufacturer.

3.3 INSTALLATION - ACCESSORIES

- A. Install access panel recess frames.
- B. Install fillet strips at base of walls where flooring is to be extended up wall as base.

3.4 INSTALLATION - FLOORING

- A. Apply in accordance with manufacturer's instructions.
- B. Apply each coat to minimum thickness required by manufacturer.
- C. Finish to smooth level surface.
- D. Cove at vertical surfaces.

3.5 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Test installed floor surface in accordance with ANSI/ESD STM7.1 .

3.6 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Barricade area to protect flooring until fully cured.

END OF SECTION

SECTION 09 68 16 - CARPETING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Modular tile carpeting, adhesive installation.
- B. Accessories.
- C. Related Sections
 - 1. Section 01 35 42, CALGreen Requirements.
 - 2. Section 09 05 61, Common Work Results for Floor Preparation.
 - 3. Section 09 65 13, Resilient Base.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. ASTM D5116 Standard Guide from Small Scale Environmental Chamber
Determinations of Organic Emissions from Indoor Materials/Products.
- C. ASTM E648 and NFPA 253 - Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- D. ASTM E662-Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- E. ASTM F 1869 - Test Method for Measuring Moisture Vapor Emission.
- F. ASTM F 2170 - Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes.
- G. CBC - California Building Code, 2022 CBC, Chapters 11B.
- H. California Green Building Standards Code, CALGreen 2022.
- I. ADA - Americans with Disabilities Act of 1990
 - 1. ADA Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.
- J. National Bureau of Standards - NBS.
- K. SCAQMD - South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications.

1.3 SUBMITTALS

- A. Shop drawings showing seaming plan, method of joining seams and direction of carpet based on field measurements.
 - 1. Follow Carpet and Rug Institute's recommendation on seams:
 - a. Keep seams to a minimum and positioned so that, where possible:
 - 1) Seams run the length of the area.
 - 2) Main traffic runs parallel to, rather than across the seam.
 - 3) Natural light does not strike across the seam.
 - 4) Seams are away from areas subject to pivoting traffic.
 - 5) Seams are not perpendicular to doorway openings. When two or more pieces of the same carpet are seamed together, the pile shall run in the same direction.
 - b. Properly constructed seam shall have the following properties:
 - 1) Has cleanly trimmed edges properly secured with appropriate adhesive prior to seaming.
 - 2) Has tightly abutted edges without gaps or overlaps.
 - 3) Maintains uniform appearance on the surface of the carpet.
 - 2. Seaming plan shall have the approval by Architect prior to start Work of this Section.
- B. Product data on specified products, describing physical and performance characteristics, sizes, patterns, colors available and method of installation.
- C. Three samples 12 by 12 inch in size illustrating color and pattern for each carpet material specified.
 - 1. Carpet Seam: 6-inch Sample.
- D. Manufacturer's installation instructions.
- E. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code, per paragraph 1.05.E.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in carpet with ten years' minimum experience.
- B. Installer: Company with three years' minimum experience, certified when required by the manufacturer.

- C. Regulatory Requirements: Carpet shall have level loop, textured loop, or level-cut/uncut pile texture, firm cushion, pad or backing (or no cushion or pad) and maximum pile height of 1/2 inch in accordance with CBC Section 11B-302.2. Carpet edges shall comply with CBC 11B-303, and carpet trim to CBC Section 11B-302.2.
- D. Fire Classification Requirements
 - 1. ASTM E648, NFPA 253: Class I, Heat Flux Minimum 0.45 watts per sq cm.
 - 2. Smoke density not greater than 450 when tested in accordance with ASTM E662.
- E. California Green Building Standards Code, CALGreen 2022.
 - 1. Adhesives, sealants, primers, and caulks shall comply with air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, per CALGreen Tables 5.504.4.1 and 5.504.4.2.
 - 2. Paints and Coatings shall comply with VOC limits in Table 1 of the ARB, per CALGreen Table 5.504.4.3.
- F. Adhesives shall comply with VOC content limits defined by: SCAQMD Rule 1168

1.5 OPERATION AND MAINTENANCE DATA

- A. Operation and maintenance.
- B. Include maintenance procedures, recommended maintenance materials and suggested schedule for cleaning and shampooing.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Store materials in sufficient time prior to installation in area of installation to achieve temperature stability.
- B. Maintain minimum 70 degrees F ambient temperature three days prior to, during and 24 hours after installation of materials.

1.7 EXTRA MATERIALS

- A. Provide an average of 3 percent in usable size of carpeting of each color specified, not less than 12 inches long by roll width.

1.8 WARRANTY

- A. Special Warranty for Carpet: Manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, excess static discharge, permanent indentation or compression, and delamination.
 - 2. Warranty Period: 15 years from date of Substantial Completion.

1.9 MOISTURE AND ALKALINITY TESTING

- A. Contractor shall test all concrete floors to receive carpet flooring for moisture content as described in Division 01, General Requirements for Quality Requirements, and this Section.
- B. Test concrete flooring in accordance with ASTM F1869 and ASTM F 2170.
- C. Submit Test results and data to Owner and Architect.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of following manufacturers form basis for design and quality intended.
 - 1. Tandus Centiva
- B. No Substitutions.

2.2 MATERIALS

- A. Styles and colors: Refer to Drawings.
 - 1. Backing system to be guaranteed for up to 3 pounds of moisture. Adhesives to be per carpet manufacturer's recommendation. Slabs to be tested according to carpet manufacturer's directions prior to ordering of carpet.
 - 2. Provide carpeting from same print run or dye lot.

2.3 MANUFACTURERS - REDUCER STRIPS AND ACCESSORIES

- A. Products of following manufacturers form basis for design and quality intended.
 - 1. Duramax Inc./Johnsonite, Chagrin Falls, OH.
 - 2. The Roppe Co., Fostoria, OH.
 - 3. Mercer Products Co., Inc. Orlando, FL.
 - 4. The Flexco Co., Tuscumbia, AL.
 - 5. AFCO Rubber Corp., North Canton, OH.
- B. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.4 EDGE GUARDS, ADAPTERS AND ACCESSORIES

- A. 1/4 Inch Roppe #169 Glue Down Reducer 632 Flax
- B. 3/16 Inch Roppe #160 Glue Down Reducer 632 Flax
- C. Resilient Subfloor Leveler Strips: Subfloor Leveler System by Roppe.
 - 1. Homogeneous composition of polyvinyl chloride (PVC), high quality additives, and colorants.

- 2. Exceeds ASTM E 648 Class 1 Flammability
- D. Carpet edge guards shall comply with CBC Section 11B-302.2.
- E. Stair nosing: Rubber, Safety nosings with contrasting colors, Mercer 255R, 2 inches or equal.
- F. Colors: as indicated on Drawings.

2.5 FILLER AND SEALERS

- A. Subfloor Filler: Latex based underlayment acceptable to the manufacturer.
- B. Primers and Sealers: Type recommended by carpet manufacturer in full compliance with California VOC regulations.
 - 1. Adhesives shall comply with VOC content limits defined by: SCAQMD Rule 1168

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft, and are ready to receive Work.
- B. Prior to delivery of carpeting, conduct Calcium-Chloride Test Method in accordance with ASTM 1869 to verify that concrete floor slabs are dry with maximum moisture vapor emissions of 3 pounds per 1,000 square feet in 24 hours and that slabs exhibit negative alkalinity, carbonation or dusting. Apply the moisture test in four (4) different areas of each floor location, with at least one test for each 1,000 square feet of floor area.
- C. Prior to delivery of carpeting, conduct Relative Humidity Test Method in accordance with ASTM F2170 using a Wagner Rapid RH probe to verify relative humidity and surface pH of concrete floor slabs, the method:
 - 1. Requires drilling holes at diameter not to exceed outside diameter of probe by more than 0.04 inch to depth equal to 40 percent of slab's thickness (elevated structural slab shall be tested at depth equal to 20 percent of slab thickness).
 - 2. Place probe to full depth of test hole, place cap over probe.
 - 3. Permit test site to acclimate, or equilibrate, for 72 hours prior to taking relative humidity readings.
 - 4. Remove cap and press button on the probe to obtain reading.
 - 5. Relative humidity readings for substrates receiving non-permeable flooring are 75% or lower.
 - 6. Testing shall require 3 tests in first 1,000 square feet, with one additional test per each additional 1,000 square feet of concrete slab surface.

- D. Alkalinity Testing: Concrete floors shall be tested for alkalinity prior to the installation of carpet flooring. Levels of pH shall not exceed the written recommendations of the carpet manufacturer or the adhesive manufacturer, or both.
- E. Delivery of flooring materials and beginning of installation means acceptance of existing substrate and site conditions.

3.2 PREPARATION

- A. Install Vapor Emission Treatment Systems per Section 09 05 61.
- B. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with subfloor filler.
- C. Apply, trowel and float filler to leave a smooth, flat, hard surface, free of bumps or depressions of any size.
- D. Prohibit traffic from area until filler is cured.
- E. Vacuum clean substrate.
- F. Apply primer as recommended by the materials manufacturer.
- G. Maintain dye lot integrity. Do not mix dye lots in same area.

3.3 INSTALLATION - FACTORY INSTALLED DRY ADHESIVE

- A. Apply carpet in accordance with manufacturers' instructions.
 - 1. Securely attach carpet on floor surface as recommended by carpet manufacturer.
- B. Lay out rolls of carpet for approval.
- C. Verify carpet match before cutting to ensure minimal variation between dye lots.
- D. Double cut carpet at 2" overlapped edges to allow intended seam and pattern match. Make cuts straight, true and un-frayed. Edge seal carpet where required to prevent fraying.
- E. Fit seams straight, not crowded or peaked, free of gaps.
- F. Lay carpet on floors with run of pile in same direction as anticipated traffic.
- G. Do not change run of pile in any room where carpet is continuous through a wall opening into another room. Locate change of color or pattern between rooms under door centerline.
- H. Cut and fit carpet around interruptions. Extend carpets into cabinets that do not contain bottoms.
- I. Fit carpet tight to intersection with vertical surfaces without gaps.
- J. Fasten carpet edges to floor surfaces, and provide edge guard along entire length of

the exposed edge.

1. Edge guards shall comply with code requirements for changes in level.

K. Install in accordance with CBC Section 11B-302.2.

3.4 CLEANING

A. Remove excessive adhesive from floor, base and wall surfaces without damage.

B. Clean and vacuum carpet surfaces.

3.5 PROTECTION

A. Prohibit traffic from carpet areas for 24 hours after installation.

END OF SECTION

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SECTION 09 90 00 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Fluid applied paints and coatings. Upon completion of Work, all visible interior and exterior surfaces, within the Contract limits shall be painted unless scheduled "Not to Be Painted in this Section."
 - 1. Each paint system includes:
 - a. Surface preparation, including touch-up of shop applied primers, if needed.
 - b. Prime coat application, where scheduled as part of finish system.
 - c. Finish coat application, where scheduled apply two or more finish coats.
 - 2. Paint semi-concealed areas (e.g. inside of light troughs and valances, behind grilles, and projecting edges above and below sight lines, behind wall-mounted items).
- B. Surfaces Not to be Painted:
 - 1. Prefinished wall, ceiling, and floor coverings.
 - 2. Items with factory-applied final finish.
 - 3. Concealed ducts, pipes, and conduit.
 - 4. Glass, plastic laminate, ceramic tile, anodized aluminum.
 - 5. Surfaces of steel items that will be embedded in concrete.
 - 6. Surfaces specifically scheduled or noted on the Drawings not to be painted.
 - 7. Fire-Rating labels on doors and frames.
 - 8. Performance labels on doors and frames.
- C. Related Sections:
 - 1. Section 01 35 42, CALGreen Requirements.

1.2 REFERENCE STANDARDS

- A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.
- B. ASTM International - American Society for Testing and Materials
 - 1. ASTM D 4442 - Direct Moisture Content Measurement of Wood and Wood-Base Materials.
 - 2. ASTM D 4444 - Use and Calibration of Hand-Held Moisture Meters.
 - 3. ASTM D 6386 - Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.

- C. California Green Building Standards Code, CALGreen 2022.
- D. AQMD - Air Quality Management District: AQMD Regulations - Local Regulations
- E. SCAQMD - South Coast Air Quality Management District: SCAQMD-1113 - Rule 1113, Architectural Coatings.
- F. SSPC - Steel Structures Painting Council.

1.3 SUBMITTALS

- A. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code per 1.06.A.
- B. Product Data: For each paint system product and accessory item.
- C. Samples: Of each specified finish system color, texture, and sheen; samples shall be minimum 8-1/2 by 11 inches in size.
 - 1. Prepare transparent wood finish samples on type and quality of wood specified.
- D. Certified copies of moisture test results.
- E. Informational Submittals:
 - 1. Statement of Qualifications from manufacturer.
 - 2. Statement of Qualifications from installer.
 - 3. Manufacturer's application instructions.
- F. Closeout Submittals
 - 1. Material Safety Data Sheets.
- G. Submit Qualifications data for manufacturer and applicator [, and sign painter] required under Quality Assurance.

1.4 MAINTENANCE MATERIALS AND SUBMITTALS

- A. For each color, type, and gloss of paint used in the work provide, as Extra Materials, a quantity equal to approximately 10 percent of the quantity required for its installation rounded to the nearest gallon, or five gallons, whichever is less.
 - 1. Extra Materials shall be from the same production run as installed materials.
 - 2. Label each container with locations and dates of related installations; do not obscure manufacturer's label.
 - 3. Deliver Extra Materials to Site as directed by Owner.

1.5 QUALITY ASSURANCE

- A. California Green Building Standards Code, CALGreen 2022.

1. Adhesives, sealants, primers and caulks shall comply with air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, per CALGreen Tables 5.504.4.1 and 5.504.4.2.
 2. Paints and Coatings shall comply with VOC limits in Table 1 of the ARB, per CALGreen Table 5.504.4.3.
- B. Manufacturer's Qualifications: Company with minimum 10-years' experience manufacturing quality paint and finish products for commercial projects similar in scale and complexity to those required for this Project.
- C. Applicator Qualifications: Company with minimum 5-years' experience painting and finishing commercial projects similar in scale and complexity to those required for this Project.
- D. Materials, for each paint system, shall be by, or as recommended by, a single coating manufacturer for use together in commercial quality paint / coating system for the substrate and exposure conditions indicated.
- E. Regulatory Requirements
1. Conform to AQMD Regulations for maximum VOC limits. Conform to SCAQMD-1113 for maximum VOC limits, copies of Rule 1113 are available at Architect's office
 2. Comply with applicable codes and regulations of authorities having jurisdiction including those with jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this Specification, comply with the more stringent provisions.
- F. Field Samples: Provide Field Sample of each finish system color, texture, and sheen scheduled. Do not proceed with coating application until sample panel has been approved.
1. Field Sample shall be full height of wall by 10-feet.
 2. Locate as approved by Architect.
 3. Adjust materials and methods of installation as required to obtain Architect's approval.
 4. Document materials and methods used to obtain Architect's approval and maintain at least one copy of this documentation on site while related work is in progress.
 5. Maintain access to and protect Field Sample from damage while related work is in progress.
 6. Upon acceptance of related work, approved sample may remain as part of Work.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site in their original, sealed, undamaged containers with labels intact and legible.
 - 1. Labels shall include manufacturer's name, type of paint, brand name, brand code, color designation, recommended surface preparation, typical coverage, drying times, cleanup procedures, and instructions for mixing and reducing, if permitted.
- B. Store paint materials ambient temperatures between 45- and 90-degrees F, in well ventilated area unless permitted otherwise by manufacturer's instructions.
- C. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.7 FIELD CONDITIONS

- A. Supply continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45-degrees F for 24-hours before, during and 48-hours after application of finishes, unless permitted otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings during rain, or when relative humidity is above 50 percent, unless permitted otherwise by manufacturer's instructions.
- C. Minimum application temperatures for Latex Paints: 45-degrees F for interiors, 50-degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum application temperature for Varnish and Transparent Finishes: 65-degrees F for interior or exterior, unless permitted otherwise by manufacturer's instructions.
- E. Maintain lighting level sufficient to conduct painting operations.

1.8 GUARANTEE

- A. Guarantee the painting Work against peeling, fading, cracking, blistering or crazing for a period of two years form the Date of Certified Completion for painting of new surfaces and existing surfaces.

PART 2 - PRODUCTS

2.1 PAINTS AND COATINGS

- A. Acceptable Manufacturers: Products of following manufacturers form basis for design and quality intended.
 - 1. Vista Paint Corporation, Fullerton, CA.
- B. No Substitutions.

2.2 MATERIALS

- A. Coatings: Ready mixed, except field-catalyzed coatings. Process pigments to soft past consistency, capable of being readily and uniformly dispersed to homogenous coating.

- B. Colors and Glosses: As scheduled on Drawings. Architect will select color and hue to be used in various types of paint specified and will be sole judge of acceptability of various glosses obtained from materials proposed to be used in Work. During actual painting, Architect may make minor modifications in tone and shade to adjust for actual surface and lighting conditions encountered.
- C. Undercoats and Thinners: Provide undercoat paint produced by same manufacturer as finish coat. Use only thinners recommended by paint manufacturer and use only to recommended limits. Use undercoat, finish coat and thinner material as parts of a unified system of paint finish.
- D. Coatings: Good flow and brushing properties; capable of drying or curing free of streaks or sags.
- E. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified of commercial quality.

2.3 APPLICATION EQUIPMENT

- A. For application of the approved paint, use only such equipment as is recommended by the manufacturer.
- B. Compatibility: Prior to actual use of application equipment, use all means necessary to verify that the proposed equipment is actually compatible with the material to be applied and that the integrity of the finish will not be jeopardized by the use of the proposed application equipment.

2.4 FINISHES

- A. Refer to schedule at end of Section for surface finish and as indicated on Drawings. Notwithstanding product numbers listed in schedule, Contractor shall conform to most recent product numbers as published by the manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of Work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of new surfaces using an electronic moisture meter. Apply finishes only when moisture content of surfaces are below the following maximums. Conduct moisture measurements in presence of the project inspector, document readings and submit to Architect under Part 1.
 - 1. Plaster and Gypsum Wallboard: 12 percent.
 - 2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.

3. Interior Located Wood: 15 percent, measured in accordance with ASTM D 4442 and ASTM D 4444.

D. Beginning installation means acceptance of existing surfaces and conditions.

3.2 MATERIALS PREPARATION

- A. Mix and prepare painting material in accordance with manufacturer's recommendations.
- B. Store materials not in actual use in tightly covered containers.
- C. Maintain containers used in storage, mixing and application of paint in a clean condition, free from foreign materials and residue.
- D. Stir all materials before application to produce a mixture of uniform density and as required during the application of materials. Do not stir into the material any film that may form on the surface. Remove the film and strain the material before using.

3.3 SURFACE PREPARATION

- A. Remove electrical plates, hardware, light fixture trim and fittings prior to preparing surfaces for finishing.
- B. Correct minor defects and clean surfaces which affect Work of this section.
- C. Shellac and seal marks that may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Insulated Coverings: Remove dirt, grease and oil from canvas and cotton.
- F. Gypsum Board Surfaces: Fill minor defects, joints and nail head depressions with spackling compounds. Prime in accordance with primer manufacturer's recommendations. Apply primer over skim coat for Level 5 finish.
- G. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish. Remove dirt, loose mortar, scale, salt or alkali powder and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering or corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
 1. Concrete Floors: etch existing concrete bare floors with 5% Muriatic Acid solution where scheduled to be painted.
- I. Galvanized Surfaces:
 1. Prepare galvanized steel and nonferrous metal surfaces in accordance with ASTM D 6386-Surface Preparation of Galvanized Surfaces and manufacturer's instructions.

2. Ensure surfaces are dry.
3. Interior Exposure (Dry/Benign): Remove visible, oil, grease, dirt, dust, protective mill coatings, and other soluble contaminants in accordance with SSPC-SP 1 or manufacturer's instructions as specified for coating system. Pland or Power tool clean to remove all insoluble contaminants.
4. Interior and Exterior Exposure (moderate to severe): Remove visible oil, grease, dirt, dust, protective mill coatings, and other soluble contaminants in accordance with SSPC-SP 1 or manufacturer's instructions as specified for coating system. Follow initial cleaning with one of the following Methods:
 - a. SURFACE PREPARATION METHOD A (Preferred): Thoroughly roughen the entire surface to be coated using compressed air brush off blast cleaning with a fine abrasive to achieve a uniform anchor profile of 1-2 mils, reference ASTM D 6386-99 (2005) Section 5.4.1.
 - b. SURFACE PREPARATION METHOD B (Alternative method when Method A is not feasible): Chemically Treat with one of the following products to etch the galvanized surface to be coated: Henkel Galvaprep 5 or Clean & Etch by Great Lakes Laboratory. Reference ASTM D 6386-99 (2005) Section 5.4.2.
- J. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime paint after repairs with Themec Series L69 Hi Build Epoxoline II or Carboline 890 VOC or approved in accordance with Division 01, General Requirements for Substitutions.
- K. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Spot prime bare steel surfaces to match existing primer.
- L. Wood Scheduled to Receive Paint Finish: Remove dust, grit and foreign matter. Seal knots, pitch streaks and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied.
 1. Exterior Wood: apply wood preservative coats prior to paint system.
- M. Wood Doors and Cabinet Work schedules for field-applied transparent or solid stain finish:
 1. Sand surfaces thoroughly with a 5/0, 180 grit sandpaper.
 2. Apply coatings as specified in the schedule to all surfaces, sides and edges. Avoid streaking or uneven application. Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail or screw holes, or other surfaces imperfections.
 3. Stains as selected by Architect from manufacturer's full range of colors.

- 4. Provide satin finish for final coats.
- N. Wood Doors Scheduled for Painting: Seal top and bottom edges with primer. Leave labels intact and readable.
- O. Door and Window Frames, Side Lights, Jambs and Headers: clean and light sand smooth.

3.4 PROTECTION

- A. Protect elements surrounding the Work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by Work of this Section.
- C. Furnish drop cloths, shields and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.5 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Apply each coat to uniform finish. Number of coats specified is a minimum. Additional coats shall be applied at no extra cost, if coatings show evidence of uneven application, uneven pigmentation, brush strokes or otherwise unsatisfactory distribution of material.
- D. Under coats shall be lighter and brighter in tint than finish coat.
- E. Sand lightly between coats to achieve required finish.
- F. Allow applied coat to dry before next coat is applied.
- G. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- H. Prime back surfaces of interior and exterior woodwork with primer paint.
- I. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with floss varnish reduced 25 percent with mineral spirits.
- J. Seal tops, bottoms and cutouts for hardware and accessories of wood doors and plastic-laminate covered doors.
- K. Paint Frames: Split paint door frames to match color of walls on each side of opening unless directed otherwise by Architect.
- L. Exterior fascia, trims, reveals, and ornamental fences and gates shall receive accent paint colors different from field paint color.
- M. Paint finish shall continue through behind all wall-mounted items (e.g. markerboards, chalk and tack boards).

3.6 CLEANING

- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.
- B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials and debris.
- C. Collect cotton waste, cloths, and material that may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.7 FINISH SYSTEM SCHEDULE - EXTERIOR EXPOSURE

Vista

- A. Concrete - Flat - Acrylic
 - 1. Primer, 1 Coat 4600 436
 - 2. Finish, 2 Coats 2200
- B. Concrete - Low Sheen - Acrylic
 - 1. Primer, 1 Coat 4600 436
 - 2. Finish, 2 Coats 7500
- C. Concrete - Elastomeric
 - 1. Primer, 1 Coat 4600 436
 - 2. Finish, 2 Coats 500
Solotex
- D. Concrete Block - Flat - Acrylic
 - 1. Primer, 1 Coat 018 50
 - 2. Finish, 2 Coats 2200
- E. Concrete Block - Low Sheen - Acrylic
 - 1. Primer, 1 Coat 018 50
 - 2. Finish, 2 Coats 7500
- F. Concrete Block - Semi-Gloss - Acrylic
 - 1. Primer, 1 Coat 018 50
 - 2. Finish, 2 Coats 7000
- G. Concrete Block - Gloss - Acrylic
 - 1. Primer, 1 Coat 018 50
 - 2. Finish, 2 Coats 8500
- H. Concrete Block - Elastomeric
 - 1. Primer, 1 Coat 018 50
 - 2. Finish, 2 Coats 500
Solotex
- I. Ferrous - Flat - Acrylic
 - 1. Primer, 1 Coat 9600 436
 - 2. Tie Coat 1 Coat 2200
 - 3. Finish, 1 Coat 2200 610

- J. Ferrous - Semi-Gloss - Acrylic
 - 1. Primer, 1 Coat 9600 436
 - 2. Tie Coat, 1 Coat 9800
 - 3. Finish, 1 Coat 9800 670
- K. Ferrous - Gloss - VOC Compliant
 - 1. Primer, 1 Coat 9600 436
 - 2. Finish, 2 Coats 9900
- L. Ferrous - Factory Primed. If shop primer is compatible with finish materials, clean and touch-up prime coat in lieu of full primer coat then apply paint finish as specified.
- M. Galvanized Steel and Aluminum - Flat - Acrylic
 - 1. Surface Prep Krud
Kutter
 - 2. Primer, 1 Coat 4800
 - 3. Finish, 2 Coats 9800
- N. Galvanized Steel and Aluminum - Gloss - VOC Compliant
 - 1. Surface Prep Jasco
P&P
 - 2. Primer, 1 Coat 4800
 - 3. Finish, 2 Coats 9900
- O. Galvanized Steel and Aluminum - Semi-Gloss - Acrylic
 - 1. Surface Prep Krud
Kutter
 - 2. Primer, 1 Coat 4800
 - 3. Finish, 2 Coats 7000

3.8 FINISH SYSTEM SCHEDULE - INTERIOR SURFACES

Vista

- A. Wood - Opaque - Flat - Acrylic
 - 1. Primer, 1 Coat 4200
 - 2. Finish, 2 Coats 5100
- B. Wood - Opaque - Semi-Gloss - Acrylic
 - 1. Primer, 1 Coat 4200
 - 2. Finish, 2 Coats 5400
- C. Wood - Opaque - Eggshell - Acrylic
 - 1. Primer, 1 Coat 4200
 - 2. Finish, 2 Coats 5300
- D. Wood - Opaque - Gloss - Acrylic
 - 1. Primer, 1 Coat 4200 7 5
 - 2. Finish, 2 Coats 8500

- E. Wood - Transparent with Stain - Non-Yellowing - Flat Lacquer
 - 1. Stain, 1 Coat VWS
 - 2. Sealer, 1 Coat NAS1420
 - 3. Lacquer, 2 Coats NAF1421
- F. Wood - Transparent with Stain - Non-Yellowing - Semi-Gloss Lacquer
 - 1. Stain, 1 Coat VWS
 - 2. Sealer, 1 Coat NAS1420
 - 3. Lacquer, 2 Coats NAF1426
- G. Concrete, Plaster, Masonry - Flat - Acrylic
 - 1. Primer, 1 Coat 4000
 - 2. Finish, 2 Coats 5100
- H. Concrete, Plaster, Masonry- Eggshell - Acrylic
 - 1. Primer, 1 Coat 4000 75
 - 2. Finish, 2 Coats 5300
- I. Concrete, Plaster, Masonry- Semi-Gloss - Acrylic
 - 1. Primer, 1 Coat 4000
 - 2. Finish, 2 Coats 5400
- J. Gypsum Board - Flat - Acrylic (Skim Coat required for Level 5 finish)
 - 1. Primer, 1 Coat 1100
 - 2. Finish, 2 Coats 5100
- K. Gypsum Board - Eggshell- Acrylic (Skim Coat required for Level 5 finish)
 - 1. Primer, 1 Coat 1100
 - 2. Tie Coat, 1 Coat 5300
 - 3. Finish, 2 Coats 5300
- L. Gypsum Board - Semi-Gloss - Acrylic (Skim Coat required for Level 5 finish)
 - 1. Primer, 1 Coat 1100
 - 2. Finish, 2 Coats 5400
- M. Gypsum Board - Gloss - Acrylic (Skim Coat required for Level 5 finish)
 - 1. Primer, 1 Coat 1100
 - 2. Tie Coat, 1 Coat 5400
 - 3. Finish, 2 Coats 5400
- N. Ferrous - Flat - Acrylic
 - 1. Primer, 1 Coat 9600 436
 - 2. Tie Coat, 1 Coat 5100
 - 3. Finish, 1 Coat 5100 310
- O. Ferrous - Semi-Gloss - Acrylic
 - 1. Primer, 1 Coat 9600
 - 2. Tie Coat, 1 Coat 5400
 - 3. Finish, 1 Coat 5400

- P. Ferrous - Gloss - Acrylic
 1. Primer, 1 Coat 9600
 2. Tie Coat, 1 Coat 9600
 3. Finish, 1 Coat 5400
- Q. Ferrous - Factory Primed. If shop primer is compatible with scheduled finish, clean and touch-up prime coat then apply Finish as scheduled.
- R. Galvanized and Aluminum - Flat - Acrylic
 1. Surface Prep Krud
 Kutter
 2. Primer, 1 Coat 4800
 3. Finish, 2 Coats 5100
 4. Finish, 2 Coats (Stainless Steel) SPMA10
- S. Galvanized and Aluminum - Semi-Gloss - Acrylic
 1. Surface Prep Krud
 Kutter
 2. Primer, 1 Coat 4800 436
 3. Finish, 2 Coats 5400
 4. Finish, 2 Coats (Stainless Steel) SZRO50
- T. Galvanized and Aluminum - Gloss - Acrylic
 1. Surface Prep Krud
 Kutter
 2. Primer, 1 Coat 4800
 3. Finish, 2 Coats 5400
 4. Finish, 2 Coats (Stainless Steel) SZRO050

3.9 SPECIAL COATING SYSTEMS

- A. Special Coatings: Exterior; roof sheet metal flashings ladders, ornamental metal gates, trash and equipment enclosures, Architecturally Exposed Structural Steel (AESS), exterior metal stairs, roof hatches and scheduled items in Section 05 50 00, Metal Fabrications. Total 5.0 to 8.5 mil thickness, as recommended by the manufacturer.

3.10 SPECIAL COATING SYSTEMS

- A. Special Coatings: Exterior; roof sheet metal flashings ladders, ornamental metal gates, trash and equipment enclosures, Architecturally Exposed Structural Steel (AESS), exterior metal stairs, roof hatches and scheduled items in Section 05 50 00, Metal Fabrications. Total 5.0 to 8.5 mil thickness, as recommended by the manufacturer.

	PPG	Tnemec	Sherwin	Carboline	PPG
1. Unprimed or shop primed – Ferrous – Gloss- Polyurethan					
a. Primer, 1 Coat	Amercoat 385	L69	B58-620	Carbomastic 15	203V
b. Finish, 2 Coats	Americhield	1080	B65-625	Carbothane 134 MC	379H

2.	Unprimed or shop primed – Ferrous – Semi-Gloss – Polyurethane					
a.	Primer, 1 Coat	L69	B58-620	Carboguard	203V	
b.	Finish, 2 Coats	1081	B65-625	Carbothane	378H	
			33 VOC			
3.	Galvanized or Aluminum - Gloss - Polyurethane					
a.	Primer, 1 Coat	Amerlock	L69	B58-620	Galoseal	203V
		400			WB	
b.	Finish, 2 Coats	Amerishield	1080	B65-625	Carbothane	379H
4.	Galvanized or Aluminum – Semi-Gloss – Polyurethane					
a.	Primer, 1 Coat	L69	B58-620	Carboguard	203V	
				90 VOC		
b.	Finish, 2 Coats	1081	B65-625	Carbothane	378H	
				33 MC		

TERRACE VIEW ES - TK MODULAR ADDITION
COLTON JOINT UNIFIED SCHOOL DISTRICT
SGH Project No. 22-12107-00

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SECTION 10 28 00 – TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.
 - 2. Warm-air dryers.
 - 3. Under lavatory guards.
- B. Related Requirements
 - 1. Section 08 80 00, Glazing, for frameless mirrors.

1.2 SUBMITTALS

- A. Product Data
 - 1. Construction details and dimensions.
 - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Material and finish descriptions.
 - 4. Features that will be included for Project.
 - 5. Manufacturer's warranty.
- B. Product Schedule: Indicate types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated.
 - 2. Identify products using designations indicated.
- C. Closeout Submittals
 - 1. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.3 QUALITY ASSURANCE

- A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

1.4 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED PRODUCTS

- A. Refer to specific products below for indication of Owner-furnished, Contractor-Installed (OFCI) or Owner-Furnished, Owner-Installed (OFOI) products.

2.2 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.
- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.
- D. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- F. Mirrors: Stainless steel framed, ¼ inch thick annealed float glass; ASTM C1036.
 - 1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
 - 2. Size: as indicated on drawings.
 - 3. Frame: 0.05 inch angle shapes, with mitered, welded, and ground corners, and tamperproof hanging system, satin finish.
 - 4. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.

2.3 TOILET ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Bobrick Washroom Equipment, Inc., North Hollywood, CA.
 - 2. Or equal, as approved under provisions of Division 01.
- B. Toilet Paper Dispenser:
 - 1. B-3888, classic series recessed mount with lock.
- C. Paper Towel Dispenser:
 - 1. B-262, classic series, surface mount.

- D. Soap Dispenser:
 - 1. B-2111, classic series, liquid type with maximum 5 lb. operating force, wall mount.
- E. Feminine Napkin Disposal:
 - 1. B-270 napkin/tampon disposal, surface mount.
- F. Toilet Seat Cover Dispenser:
 - 1. B-221, classic series, surface mount.
- G. Grab Bars:
 - 1. B-6806 Series, 36 inches long toilet compartment grab bar, concealed mounting, set screw flange cover, satin finish.
 - 2. B-6806 Series, 48 inches long toilet compartment grab bar, concealed mounting, set screw flange cover, satin finish.
- H. Surface Mount Mirror
 - 1. B-2902436, satin finish.

2.4 UNDERLAVATORY GUARDS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Truebro by IPS Corporation.
 - 2. Or equal, as approved under provisions of Division 01.
- B. Underlavatory Guard
 - 1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings. Provide at every sink.
 - 2. Material and Finish: Antimicrobial, molded plastic, white.

2.5 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 REGULATORY REQUIREMENTS

- A. Accessories required to be accessible shall be mounted at heights according to CBC Section 11B-603.
- B. Accessories shall not be located closer than 1-1/2 inch clear of a tangent point below the grab bar, nor less than 12 inches above the grab bar. CBC Section 11B-609.3.

3.2 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

3.3 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Piping materials and installation instructions common to most piping systems.
 - 2. Transition fittings.
 - 3. Dielectric fittings.
 - 4. Mechanical sleeve seals.
 - 5. Sleeves.
 - 6. Escutcheons.

1.3 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.4 SUBMITTALS

- A. Product Data: Submit brochures for the following materials to the Architect in accordance with the provisions of Division 1 of these specifications.
 - 1. Transition fittings.
 - 2. Dielectric fittings.
 - 3. Mechanical sleeve seals.
 - 4. Escutcheons.

1.5 QUALITY ASSURANCE

- A. Codes and Standards:

1. All governing Codes, Ordinances and Agencies, in accordance with the provisions of Division 1 of these specifications.

B. Warranty: In accordance with the provisions of Division 1 of these specifications.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

1.7 DISCREPANCIES

- A. The Contractor shall check all Drawings furnished immediately upon their receipt and shall promptly notify the Owner's Representative of any discrepancies.
- B. Where requirements between Drawings and Specifications conflict, the more restrictive provisions shall apply.
- C. If any part of the Specifications or Drawings appears unclear or contradictory, apply to Owner's Representative for interpretation and decision as early as possible, including during bidding period. Do not proceed with such work without Owner Representatives decision. Beginning work of any Section constitutes acceptance of conditions.

1.8 COORDINATION

- A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for plumbing installations.
- B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- C. Coordinate requirements for access panels and doors for plumbing items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in PLUMBING SPECIALTIES Section 22 11 19.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 22 piping Sections for pipe, tube, and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.3 JOINING MATERIALS

- A. Refer to individual Division 22 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
2. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated.

2.4 TRANSITION FITTINGS

- A. AWWA Transition Couplings: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.
 1. Manufacturers:
 - a. Cascade Waterworks Mfg. Co.
 - b. Dresser Industries, Inc.; DMD Div.
 - c. JCM Industries.
 2. Underground Piping NPS 1-1/2 and Smaller: Manufactured fitting or coupling.
 3. Underground Piping NPS 2 and Larger: AWWA C219, metal sleeve-type coupling.
 4. Aboveground Pressure Piping: Pipe fitting.
- B. Plastic-to-Metal Transition Fittings: PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.
 1. Manufacturers:
 - a. Eslon Thermoplastics, or equal.
- C. Plastic-to-Metal Transition Adaptors: One-piece fitting with manufacturer's SDR 11 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.
 1. Manufacturers:
 - a. Thompson Plastics, Inc., or equal.
- D. Plastic-to-Metal Transition Unions: MSS SP-107, PVC four-part union. Include brass end, solvent-cement-joint end, rubber O-ring, and union nut.
 1. Manufacturers:
 - a. NIBCO INC., or equal.

2.5 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-

joint, plain, or weld-neck end connections that match piping system materials.

- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.
 - 1. Manufacturers:
 - a. Epco Sales, Inc.
 - b. Watts Industries, Inc.; Water Products Div.
 - c. Zurn Industries, Inc.; Wilkins Div.
- D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig minimum working pressure as required to suit system pressures.
 - 1. Manufacturers:
 - a. Epco Sales, Inc.
 - b. Watts Industries, Inc.; Water Products Div.
- E. Dielectric-Flange Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
 - 1. Manufacturers:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Pipeline Seal and Insulator, Inc.
 - 2. Separate companion flanges and steel bolts and nuts shall have 150- or 300-psig minimum working pressure where required to suit system pressures.
- F. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.
 - 1. Manufacturers:
 - a. Calpico, Inc.
 - b. Lochinvar Corp.
- G. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.
 - 1. Manufacturers:
 - a. Precision Plumbing Products, Inc.
 - b. Sioux Chief Manufacturing Co., Inc.
 - c. Victaulic Co. of America.

2.6 MECHANICAL SLEEVE SEALS

- A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
 - 1. Manufacturers:
 - a. Calpico, Inc.
 - b. Metraflex Co.
 - c. Thunderline "Line-Seal".
 - 2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 - 3. Pressure Plates: Stainless steel. Include two for each sealing element.
 - 4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.7 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
 - 1. Underdeck Clamp: Clamping ring with set screws.
- E. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.
- F. PVC Pipe: ASTM D 1785, Schedule 40.
- G. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

2.8 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening. Polished chrome-plated with set screw.

PART 3 - EXECUTION

3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 22 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as closely as practical to routing indicated on plans.

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- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping to permit valve servicing.
- G. Install piping at indicated slopes.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install piping to allow application of insulation.
- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Install escutcheons for penetrations of walls, ceilings, and floors according to the following:
 - 1. New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass type with polished chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type with spring clips.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished chrome-plated finish.
 - e. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished chrome-plated finish.
 - f. Bare Piping in Equipment Rooms: One-piece, cast-brass type.
 - g. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece, floor-plate type.
- M. Sleeves are not required for core-drilled holes.
- N. Permanent sleeves are not required for holes formed by removable PE sleeves.
- O. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.
- P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 - 2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
 - 3. Install sleeves that are large enough to provide 1/2 inch annular clear space between sleeve

and pipe or pipe insulation. Use the following sleeve materials:

- a. Steel Pipe Sleeves: For pipes smaller than NPS 6.
 - b. Steel Sheet Sleeves: For pipes NPS 6 and larger, penetrating gypsum-board partitions.
 - c. Stack Sleeve Fittings: For pipes penetrating floors with membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level. Refer to Section "Sheet Metal Flashing and Trim" for flashing.
 - 1) Seal space outside of sleeve fittings with grout.
4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint.
- Q. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Install steel pipe for sleeves smaller than 6 inches in diameter.
 2. Install cast-iron "wall pipes" for sleeves 6 inches and larger in diameter.
 3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- R. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- S. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with approved firestop materials, equal to Hilti.
- T. Verify final equipment locations for roughing-in.
- U. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.2 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 22 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.3 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
 - 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 - 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
 - 3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
 - 4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.4 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.

3.5 PAINTING

- A. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.6 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Section "Metal Fabrications" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation

to support and anchor plumbing materials and equipment.

- C. Field Welding: Comply with AWS D1.1.

3.7 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor plumbing materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

END OF SECTION

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SECTION 22 05 23 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. GENERAL-DUTY VALVES FOR PLUMBING PIPING consists of furnishing transportation, labor, materials, and equipment to furnish and install the following general-duty valves:
 - 1. Ball valves.
 - 2. Check valves.
 - 3. Gate valves.

1.2 RELATED WORK

- A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 of these specifications.
- B. COMMON WORK RESULTS FOR PLUMBING - Section 22 05 00
- C. IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT - Section 22 05 53
- D. DOMESTIC AND RECYCLED WATER PIPING - Section 22 11 16

1.3 REFERENCES

- A. American Society of Mechanical Engineers (ASME)
- B. American Water Works Association (AWWA)

1.4 SUBMITTALS

- A. Product Data: For each type of valve indicated. Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimensions; and required clearances. Include list indicating valve and its application. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.

1.5 QUALITY ASSURANCE

- A. Codes and Standards:
 - 1. All governing Codes, Ordinance and Agencies, in accordance with the provisions of Division 01 of these specifications.
- B. ASME Compliance:
 - 1. ASME B16.10 and ASME B16.34 for ferrous valved dimensions and design criteria.
 - 2. ASME B31.9 for building service piping valves.
- C. NSF Compliance: NSF 61-G for valve materials for potable-water service.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, grooves, and weld ends.

3. Set gate valves closed to prevent rattling.
 4. Set ball and plug valves open to minimize exposure of functional surfaces.
 5. Block check valves in either closed or open position.
- B. Use the following precautions during storage:
1. Maintain valve end protection.
 2. Store valves indoors and maintain at higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

PART 2 - PRODUCTS

2.1 VALVES, GENERAL

- A. Refer to Valve Applications Article in this Section for applications of valves.
- B. Bronze valves shall be made with dezincification-resistant materials.
1. Valves for potable water must comply with California Lead Free Law.
 2. Lead free refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content $\leq 0.25\%$. Source: California Health Safety Code (116875).
 3. All valves must be 3rd party certified.
- C. Bronze Valves: NPS 2 and smaller with threaded ends, unless otherwise indicated.
- D. Ferrous Valves: NPS 2-1/2" and larger with flanged ends, unless otherwise indicated.
- E. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- F. Valve Sizes: Same as upstream pipe, unless otherwise indicated.
- G. Valve Actuator Types:
1. Handwheel: For valves other than quarter-turn types.
 2. Handlever: For quarter-turn valves NPS 6 and smaller, except plug valves.
 3. Locking Handlever: All valves used in recycled water piping shall be provided with locking hand levers.
- H. Valves in Insulated Piping: With 2-inch stem extensions and the following features:
1. Gate Valves: With non-rising stem.
 2. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeves that allows operation of valve without breaking the vapor seal or disturbing insulation and memory stops that are fully adjustable after insulation is applied.
- I. Valve-End Connections:
1. Flanged: With flanges according to ASME B16.1 for iron valves, ASME B16.5 for steel valves.
 2. Solder Joint: With sockets according to ASME B16.18.
 3. Threaded: With threads according to ASME B1.20.1.

J. Valve Bypass and Drain Connections: MSS SP-45.

2.2 BRONZE BALL VALVES

A. 2 ½ in. and smaller: Two-Piece, Bronze Ball Valves, Dezincification resistant lead free bronze body with full-port, stainless steel ball and trim; TFE seats; and 600-psig minimum cold working pressure rating and blowout-proof stem, MSS SP-110, NSF-61-G. Provide with locking lever handle feature where used in recycled water piping.

1. Manufacturers:

- a. Conbraco Industries, Inc.; Apollo Division: Model 77CLF-100 Series
- b. NIBCO INC., Model T-685-80-66-LF

B. 3 in. and larger: Two-Piece, Bronze Ball Valves: Dezincification resistant lead free bronze body with standard-port, chromium-plated ball and trim; RPTFE seats; and 600-psig minimum cold working pressure rating and blowout-proof stem. Provide with locking lever handle feature where used in recycled water piping.

1. Manufacturers:

- a. Conbraco Industries, Inc.; Apollo Division: Model 70LF-100 Series

2.3 BRONZE CHECK VALVES

A. 3 in. and smaller: Y-pattern, Class 125, Bronze, and Horizontal Swing Check Valves: Dezincification resistant lead free bronze body with renewable nonmetallic disc and bronze seat, MSS SP-80.

1. Manufacturers:

- a. Conbraco Industries, Inc.; Apollo Division: Model 61Y-LF Series
- b. NIBCO INC., Model T-413-Y-LF

2.4 BRONZE GATE VALVES

A. 3 in and smaller: Bronze Alloy construction, screw-in bonnet, Non-rising stem, Lead-Free bronze body with bronze solid wedge, dezincification Resistant, MSS SP-80.

1. Manufacturers:

- a. NIBCO INC., Model S or T-113-LF
- b. Conbraco Industries, Inc.; Apollo Division: Model 30-LF Series.

2.5 DUCTILE-IRON GATE VALVES

A. 4" and larger: Class 125, Bolted Bonnet, non-rising stem, resilient-wedge, flanged ends, 250 psi, epoxy coated inside and outside, ductile iron body, Lead-Free.

1. Manufacturers:

- a. NIBCO INC., Model F-619-RW

2.6 SPRING-LOADED CHECK VALVES

A. In-Line Check Valve: 2 in. and smaller; Lead-Free Bronze body, threaded, stainless steel spring, 400 psi CWP.

1. Manufacturers:

- a. NIBCO, INC., Model T-413-Y-LF.
- b. Conbraco Industries, Inc., Apollo Division: Model CVB-61-100-LF Series.
- B. Dual Check Valve: 2 in. and smaller; Lead-Free composite body, corrosion resistant internal parts, and two (2) independently operated in-line spring-loaded modular checks.
 - 1. Manufacturers:
 - a. Wilkins Model 705-XL.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- C. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- D. Examine threads on valve and mating pipe for form and cleanliness.
- E. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- F. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE APPLICATIONS

- A. Refer to piping Sections for specific valve applications. If valve applications are not indicated, use the following:
 - 1. Shutoff Service: Ball, or gate valves.
 - 2. Throttling Service: Ball valves.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.
- C. Domestic Water Piping: Use the following types of valves:
 - 1. Ball Valves: NPS 2 ½ in. and Smaller; Bronze Lead-Free Ball Valves, Two-piece, Full-Port, 600-psig CWP rating with stainless steel ball. NPS 3 in. and larger; Bronze Lead-Free Ball Valves, Two-piece, standard-port, 600 psi CWP rating with chromium-plated ball.
 - 2. Swing Check Valves, NPS 3 and Smaller: Lead-Free, "Y"-Pattern, Class 125, bronze.
 - 3. Swing Check Valves, NPS 4 and Larger: Type II, Class 125, ductile iron.
 - 4. Spring-Loaded Check Valves, NPS 2 and Smaller: Class 125, Bronze, stainless steel spring.
 - 5. Gate Valves, NPS 3 in. and smaller: Lead-Free, Bronze, non-rising stem, Lead-Free, Class 125. NPS 4 in. and larger; Ductile iron body, Lead-Free, epoxy coated, flanged ends.

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- D. Recycled Water Piping: Valves shall be the same as for domestic water piping except as follows:
1. Recycled Water Control Valves: Lever handle valves equipped with a locking feature and painted purple to match the mylar wrapping tape.

3.3 VALVE INSTALLATION

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- C. Locate valves for easy access and provide separate support where necessary.
- D. Install valves in horizontal piping with stem at or above center of pipe.
- E. Install valves in position to allow full stem movement.
- F. Install check valves for proper direction of flow and as follows:
 1. Swing Check Valves: In horizontal position with hinge pin level.
 2. Lift Check Valves: With stem upright and plumb.

3.4 JOINT CONSTRUCTION

- A. Refer to Division 22 Section "Common Work Results for Plumbing" for basic piping joint construction.
- B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

3.5 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

END OF SECTION

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SECTION 22 05 29 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Hangers and supports for plumbing piping and equipment consists of furnishing transportation, labor, materials and equipment to furnish and install the following:
 - 1. Steel pipe hangers and supports.
 - 2. Trapeze pipe hangers.
 - 3. Metal framing systems.
 - 4. Thermal-hanger shield inserts.
 - 5. Fastener systems.
 - 6. Pipe stands.
 - 7. Pipe positioning systems.
 - 8. Equipment supports.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections include the following:
 - 1. Section "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.
- B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.5 SUBMITTALS

- A. Product Data: For the following:
 - 1. Steel pipe hangers and supports.
 - 2. Thermal-hanger shield inserts.
 - 3. Powder-actuated fastener systems.

- 4. Pipe positioning systems.
- B. Welding certificates.

1.6 QUALITY ASSURANCE

- A. Welding: Welding shall be performed only by qualified welders, and shall comply with ASME Boiler Construction Code, ANSI Code and State of California requirements.
- B. Codes and Standards:
 - 1. All governing codes, ordinances and agencies, in accordance with the provisions of Division 1 of these specifications.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 STEEL PIPE HANGERS AND SUPPORTS

- A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.
- B. Manufacturers:
 - 1. B-Line Systems, Inc.; a division of Cooper Industries.
 - 2. ERICO/Michigan Hanger Co.
 - 3. Hilti Inc.
 - 4. Tolco Inc.
- C. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.
- D. Nonmetallic Coatings: Plastic coating, jacket, or liner.
- E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

2.3 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.4 METAL FRAMING SYSTEMS

- A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.
- B. Manufacturers:
 - 1. B-Line Systems, Inc.; a division of Cooper Industries.
 - 2. ERICO/Michigan Hanger Co.; ERISTRUT Div.

3. Hilti Inc.
 4. Tolco Inc.
 5. Unistrut Corp.; Tyco International, Ltd.
- C. Coatings: Manufacturer's standard finish unless bare metal surfaces are indicated.
- D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.5 THERMAL-HANGER SHIELD INSERTS

- A. Description: 100-psig- minimum, compressive-strength insulation insert encased in sheet metal shield.
- B. Manufacturers:
1. ERICO/Michigan Hanger Co.
 2. Pipe Shields, Inc.
- C. Insulation-Insert Material for Cold Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass with vapor barrier.
- D. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass.
- E. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- F. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- G. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.6 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
1. Manufacturers:
- a. Hilti, Inc.
 - b. ITW Ramset/Red Head.
 - c. Powers Fasteners.
- B. Mechanical-Expansion Anchors: Insert-wedge-type stainless steel, for use in hardened Portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
1. Manufacturers:
- a. B-Line Systems, Inc.; a division of Cooper Industries.
 - b. Hilti, Inc.
 - c. ITW Ramset/Red Head.
 - d. Powers Fasteners.

2.7 PIPE STAND FABRICATION

- A. Pipe Stands, General: Shop or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
- B. Compact Pipe Stand: One-piece plastic unit with integral-rod-roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
 - 1. Manufacturers:
 - a. ERICO/Michigan Hanger Co.
 - b. MIRO Industries.
- C. Curb-Mounting-Type Pipe Stands: Shop- or field-fabricated pipe support made from structural-steel shape, continuous-thread rods, and rollers for mounting on permanent stationary roof curb.

2.8 PIPE POSITIONING SYSTEMS

- A. Description: IAPMO PS 42, system of metal brackets, clips, and straps for positioning piping in pipe spaces for plumbing fixtures for commercial applications.
- B. Manufacturers:
 - 1. C & S Mfg. Corp.
 - 2. HOLDRITE Corp.; Hubbard Enterprises.
 - 3. Samco Stamping, Inc.

2.9 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

2.10 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

PART 2 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use padded hangers for piping that is subject to scratching.
- F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated

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stationary pipes, NPS 1/2 to NPS 30.

2. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes, NPS 1/2 to NPS 24, if little or no insulation is required.
 3. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
 4. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated stationary pipes, NPS 3/4 to NPS 8.
 5. Split Pipe-Ring with or without Turnbuckle-Adjustment Hangers (MSS Type 11): For suspension of noninsulated stationary pipes, NPS 3/8 to NPS 8.
 6. Extension Hinged or 2-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated stationary pipes, NPS 3/8 to NPS 3.
 7. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30.
 8. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
 9. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36, with steel pipe base stanchion support and cast-iron floor flange.
 10. Pipe Stanchion Saddles (MSS Type 37): For support of pipes, NPS 4 to NPS 36, with steel pipe base stanchion support and cast-iron floor flange and with U-bolt to retain pipe.
 11. Adjustable, Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes, NPS 2-1/2 to NPS 36, if vertical adjustment is required, with steel pipe base stanchion support and cast-iron floor flange.
 12. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30, from 2 rods if longitudinal movement caused by expansion and contraction might occur.
 13. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes, NPS 2-1/2 to NPS 20, from single rod if horizontal movement caused by expansion and contraction might occur.
 14. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42, if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
 15. Pipe Roll and Plate Units (MSS Type 45): For support of pipes, NPS 2 to NPS 24, if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
 16. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes, NPS 2 to NPS 30, if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.
- G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20.
- H. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

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1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- I. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 6. C-Clamps (MSS Type 23): For structural shapes.
 7. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 8. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 9. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 10. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 11. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 12. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 13. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 14. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- J. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation

- that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- K. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from hanger.
 6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.
 7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from trapeze support.
 8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
 - a. Horizontal (MSS Type 54): Mounted horizontally.
 - b. Vertical (MSS Type 55): Mounted vertically.
 - c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
- L. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.
- M. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.
- N. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.
- O. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

3.2 HANGER AND SUPPORT INSTALLATION

- A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building

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structure.

- B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.
- D. Fiberglass Strut System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled fiberglass struts.
- E. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- F. Fastener System Installation:
 - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- G. Pipe Stand Installation:
 - 1. Pipe Stand Types except Curb-Mounting Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
 - 2. Curb-Mounting-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. Refer to Section "Roof Accessories" for curbs.
- H. Pipe Positioning System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture. Refer to Division 22 Section "Plumbing Fixtures" for plumbing fixtures.
- I. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- J. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- K. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- L. Install lateral bracing with pipe hangers and supports to prevent swaying.
- M. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

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- N. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- O. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.
- P. Insulated Piping: Comply with the following:
 - 1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits according to ASME B31.9 for building services piping.
 - 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
 - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
 - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
 - 5. Pipes NPS 8 and Larger: Include wood inserts.
 - 6. Insert Material: Length at least as long as protective shield.
 - 7. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.3 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make smooth bearing surface.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

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HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.5 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.6 PAINTING

- A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touch Up: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in 09
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 22 05 53 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Identification for plumbing piping and equipment consists of furnishing transportation, labor, materials, and equipment to furnish and install the following:
 - 1. Pipe labels.
 - 2. Valve tags.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. COMMON WORK RESULTS FOR PLUMBING - Section 22 05 00

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

1.4 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

1.5 QUALITY ASSURANCE

- A. Codes and Standards:
 - 1. All governing codes, ordinances and agencies, in accordance with the provisions of Division 1 of these specifications

PART 2 - PRODUCTS

2.1 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
 - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.

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IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

2. Lettering Size: At least 1-1/4 inches high for pipe sizes 2-1/2 to 6 inches, 3/4 inch high for pipe sizes 1-1/2 to 2 inches and 1/2 high for pipe sizes 1/2 to 1-1/4 inches.
3. Color Field Length: At least 12 inches for pipe sizes 2-1/2 to 6 inches and 8 inches for pipe sizes 1/2 to 2 inches.
4. Non-potable water systems shall have the words "CAUTION: NON-POTABLE WATER, DO NOT DRINK" in upper case lettering.

2.2 VALVE TAGS

- A. Valve Tags: Provide a valve tag consisting of a 2 in. dia., 20 ga. brass disk for each valve with 1/2 in. letters identifying service designation. Fasten tags in place with continuous chain around valve stem.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 PIPE LABEL INSTALLATION

- A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 1. Near each valve and control device.
 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 5. Near major equipment items and other points of origination and termination.
 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- B. Pipe Label Color Schedule:
 1. Domestic Water Piping:
 - a. Background Color: Green.
 - b. Letter Color: White.
 2. Industrial Cold Water Piping:
 - a. Background Color: Yellow
 - b. Letter Color: Black
 3. Sanitary Waste and Storm Drainage Piping:

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- a. Background Color: Green.
- b. Letter Color: White.

3.3 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and similar roughing-in connections of end-use fixtures and units.

END OF SECTION

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SECTION 22 11 16 -DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. DOMESTIC WATER PIPING consists of furnishing transportation, labor, materials, and equipment to furnish and install domestic water piping inside the building to 5 feet outside the building.

1.2 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1, apply to this Section.
- B. COMMON WORK RESULTS FOR PLUMBING - Section 22 05 00
- C. PLUMBING SPECIALTIES - Section 22 11 19

1.3 REFERENCES

- A. American Society of Mechanical Engineers (ASME)

1.4 SUBMITTALS

- A. Product Data: For pipe, tube, fittings, couplings and sterilization report.

1.5 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9," for potable domestic water piping and components.
- C. Codes and Standards:
 - 1. All governing codes, ordinances and agencies, in accordance with the provisions of Division 1 of these specifications
- D. Comply with the California Department of Health Services, Coachella Valley Water District requirements.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Materials when not otherwise definitely specified shall conform to the applicable standards.

2.2 DOMESTIC HOT and COLD WATER PIPE AND FITTINGS

- A. Above Ground: ASTM B 88, ANSI B16.22, Type L, hard drawn copper tube and wrought copper fittings with soldered joints.
- B. Below Ground: ASTM B88, ANSI B16.22, Type K hard drawn copper tube and wrought copper fittings with soldered joints.

2.3 MATERIALS FOR JOINTS, FITTINGS AND VALVES

- A. Solder and Flux:
 - 1. Equivalent to Harris "Bridget" lead-free solder alloy, ASTM B813 liquid and paste flux. 95-5 solders are not approved. Below ground piping shall have brazed joints with silver solder.

2.4 VALVES

- A. Bronze and cast-iron, general-duty valves are specified in GENERAL-DUTY VALVES Section.
- B. Balancing and drain valves are specified in PLUMBING SPECIALTIES Section.

2.5 ENCASEMENT FOR RECYCLED WATER PIPING

- A. Provide purple colored mylar tape and wrapping per the Coachella Valley Water District requirements.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Excavating, trenching, and backfilling are specified in EARTHWORK and TRENCHING AND BACKFILLING Sections.

3.2 PIPE AND FITTING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground piping, unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing 2 in. and larger.
- D. Water-Service Piping on Service Side of Water Meter: Refer to WATER DISTRIBUTION Section.
- E. Under-Building-Slab, (allowed only at areas as indicated on Drawings), Domestic and Recycled Water, Trap primer, NPS 1 and Smaller: Hard copper tube, Type K.

3.3 VALVE APPLICATIONS

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements shall apply:
 - 1. Shutoff Duty: Use bronze ball or gate valves for piping NPS 2 and smaller. Use cast-iron butterfly or gate valves with flanged ends for piping NPS 2-1/2 and larger.
 - 2. Throttling Duty: Use bronze ball or globe valves for piping NPS 2 and smaller. Use cast-iron butterfly valves with flanged ends for piping NPS 2-1/2 and larger.
 - 3. Drain Duty: Hose-end drain valves.
 - 4. Recycled Water Control Valve: Lever handle ball valves equipped with a locking feature and painted purple to match the Mylar wrapping tape.
- B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 and smaller. Use butterfly or gate valves for piping NPS 2-1/2 and larger.

3.4 PIPING INSTALLATION

- A. Basic piping installation requirements are specified in COMMON WORK RESULTS FOR PLUMBING Section.
- B. Install under-building-slab copper tubing in conformance with to CDA's Copper Tube Handbook.

- C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in COMMON WORK RESULTS FOR PLUMBING Section.
- D. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Wall penetration systems are specified in COMMON WORK RESULTS FOR PLUMBING Section.
- E. Install shutoff valve, inside the building at domestic water service entrance.
- F. Install domestic water piping level without pitch.
- G. Wrap underground copper pipe with a minimum of 8 mils of dielectric (nonconductive), continuous "holiday" free (no "open" joints or seams; no holes or tears) polyethylene sleeve. All seams and other openings must be sealed with polyethylene tape. Do not tape wrap buried copper piping. Backfill copper piping with clean sand a minimum of 4 inches all around pipe and fittings.

3.5 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in COMMON WORK RESULTS FOR PLUMBING Section.
- B. Soldered Joints: Use ASTM B813, water-flushable, lead-free flux; ASTM B32, lead-free-alloy solder; and ASTM B828 procedure, unless otherwise indicated.
- C. Extruded-Tee Connections: Form tee in copper tube according to ASTM F2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.
- D. Brazed Joints: Construct joints according to AWS "Brazing Handbook" Pipe and Tube chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

3.6 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint Devices: NOISE, VIBRATION AND SEISMIC CONTROLS OF PLUMBING PIPING AND EQUIPMENT Section.
- B. Pipe Hanger and Support Devices are specified in HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT Section. Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet: MSS Type 49, spring cushion rolls, if indicated.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Install supports in conformance with HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT Section.
- D. Support vertical piping and tubing at base and at each floor.

- E. Rod diameter may be reduced 1 size for double-rod hangers, to a minimum of 3/8 inch.
- F. Install hangers for copper tubing in compliance with the CPC.
- G. Install supports for vertical copper tubing in compliance with the CPC.

3.7 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment and machines to allow service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve, and extend and connect to the following:
 - 1. Water Heaters: Cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
 - 2. Plumbing Fixtures: Cold- and hot-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to PLUMBING FIXTURES Section.
 - 3. Equipment: Cold- and hot-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 3 and larger.
- E. Connect recycled water piping to water-service piping with locking shutoff valve, and extend and connect to the following:
 - 1. Water closets, urinals and trap primers where indicated on plans. Recycled water supply piping in sizes indicated but not smaller than required by plumbing code. Refer to PLUMBING FIXTURES section.
 - 2. Mechanical Equipment: Recycled water supply piping as indicated, but not smaller than equipment connections. Provide shut-off valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 in. and larger.

3.8 FIELD QUALITY CONTROL

- A. Inspect domestic water piping as follows:
 - 1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
 - 2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
 - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
 - 3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
 - 4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- B. Test domestic and recycled water piping as follows:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
 2. Test for leaks and defects in piping. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 3. Leave domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
 6. Prepare reports for tests and required corrective action.
- C. Both domestic and recycled water systems shall undergo a complete thorough cross-connection test witnessed by Irvine Ranch Water District and the Health Department prior to being placed into service. Refer to Irvine Ranch Water District's On-Site Recycled Water Requirements for exact test procedure to be implemented.

3.9 ADJUSTING

- A. Perform the following adjustments before operation:
1. Close drain valves, hydrants, and hose bibbs.
 2. Open shutoff valves to fully open position.
 3. Open throttling valves to proper setting.
 4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
 - a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide flow of hot water in each branch.
 - b. Adjust calibrated balancing valves to flows indicated.
 5. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.
 6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
 7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
 8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.10 CLEANING

- A. Clean and disinfect potable and non-potable domestic water piping as follows:
1. Purge new piping and parts of existing domestic water piping that have been altered, extended, or repaired before using.
 2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction or, if methods are not prescribed, procedures described in either AWWA C651 or AWWA C652 or as described below:

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- a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
 - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
 - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.
- B. Prepare and submit reports of purging and disinfecting activities.
- C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

END OF SECTION

SECTION 22 11 19 -PLUMBING SPECIALTIES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. PLUMBING SPECIALTIES consists of furnishing transportation, labor, materials, and equipment to furnish and install the following plumbing specialties:
 - 1. Key-operation hydrants.
 - 2. Trap seal primer valves.
 - 3. Miscellaneous piping specialties.
 - 4. Access Panels.
 - 5. Flashing materials.
 - 6. Cleanouts.
 - 7. Drains.

1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1, apply to this Section.
- B. COMMON WORK RESULTS FOR PLUMBING

1.3 REFERENCES

- A. American Water Works Association (AWWA)
- B. American Society of Testing and Materials (ASTM)
- C. American Society of Sanitation Engineers (ASSE)
- D. American Society of Mechanical Engineering (ASME)

1.4 PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:
 - 1. Domestic Water Piping: 125 psig.
 - 2. Sanitary Waste and Vent Piping: 10-foot head of water.
 - 3. Storm Drainage Piping: 10-foot head of water.

1.5 QUALITY ASSURANCE

- A. Codes and Standards:
 - 1. All governing Codes, Ordinances and Agencies, in accordance with the provisions of Division 1 of these specifications.

1.6 SUBMITTALS

- A. Product Data:
 - 1. Water hammer arresters, air vents, and trap seal primer valves and systems.

2. Hose bibbs.
 3. Cleanouts, floor drains, open receptors and roof drains.
 4. Vent caps, vent terminals, and roof flashing assemblies.
 5. Sleeve penetration systems.
- B. Operation and Maintenance Data:
1. Trap seal primer valves and systems.
 2. Hose bibbs.

PART 2 - PRODUCTS

2.1 BACKFLOW PREVENTERS

- A. Hose-Connection Vacuum Breakers: ASSE 1011, nickel plated, with nonremovable and manual drain features, and ASME B1.20.7, garden-hose threads on outlet. Units attached to rough-bronze-finish hose connections may be rough bronze. Wilkins Model BFZP-8.

2.2 TRAP SEAL PRIMER VALVES

- A. TP-1: Piston Operated Trap Seal Primer Valves: ASSE 1018, pressure drop activated, with distribution unit as required.
1. Manufacturers:
 - a. Precision Plumbing Products Model P-1 or P-2, or equal.
 2. Provide for drains and floor sinks where trap primer is not provided from a water closet and as indicated and specified, each including trap primer valve, standpipe, and distribution unit(s) required for the specified distribution. Provide each concealed assembly with access panel, 8 in. by 8 inch size when distribution units are not required and 12 inches by 12 inches size when one or two distribution units are required. Provide trap primer piping same as specified for domestic water, including pipe wrapping.

2.3 MISCELLANEOUS PLUMBING SPECIALTIES

- A. Hose Bibbs:
1. HB-1: Equivalent to Woodford B74, recessed wall hydrant with locking door, vacuum breaker and loose tee key.
 2. HB-2: Equivalent to Woodford 24P - 3/4, polished chrome-plated wall faucet with vacuum breaker and loose tee key.
- B. Access Panels:
1. Access Panels in Plaster Walls and Ceilings: Karp #DSC214PL, Elmdor PW, 24x24 in. with metal access door and frame, prime coated steel and painted to match adjacent surfaces. For fire rated areas use Karp #KRP-150 FR 1-1/2 hour "B" Label access panels, U.L. listed.
 2. Access Panels in Acoustic Tile Ceilings: Karp #DSC-210, Elmdor AT, 24x24 in. with metal access door and frame, 24x24 in. minimum size, prime coated steel, recessed to accept standard tile in full opening door.
 3. Access Panels in Ceramic Tile Walls: Karp #DSC214M, Smith 4730, chrome-plated cover and frame of suitable size for purpose intended, but not less than 8x8 in. size. For fire rated areas use Karp #FRP-150 FR 1-1/2 hour "B" Label access panels, U.L. listed.

- C. Roof Flashing Assemblies: Manufactured assembly made of 4 pounds per square foot, 0.0625-inch- thick, one piece lead flashing collar and skirt extending at least 6 inches from pipe with galvanized steel boot reinforcement, and counterflashing fitting.
 - 1. Sanitary Vent Flashing: Semco 1100-3 or 1100-5, one-piece lead flashing and counter flashing sleeve.
 - 2. Other Pipe Thru Flashing: Semco 1100-2 or 1100-4, one-piece, 4 lb. lead flashing and counter flashing sleeve.
 - 3. Low-Silhouette Vent Cap: With vandal-proof vent cap.

2.4 SLEEVE PENETRATION SYSTEMS

- A. Fire-rated wall and floor penetrations shall be made with U. L. listed fire safing installed in conformance with manufacturers directions.
 - 1. Manufacturers:
 - a. Hilti.
 - b. Pro-set.
 - c. Nelson.
- B. Description: UL 1479, through-penetration firestop assembly through fire rated walls and floors.
- C. Provide at concrete or masonry exterior bearing walls: Wall sleeves shall be flush with finished surface. Sleeves shall be sized to allow 1/2 in. clearance around pipe or insulation. Insulation and covering shall be continuous through sleeves.
 - 1. Manufacturers:
 - a. Adjust-to-Crete
 - b. Paramount.
 - c. Sperzel Cretesleeve.
- D. At exterior walls below grade provide a modular mechanical seal consisting of inter-locking EPDM rubber links shaped to continuously fill the annular space between the pipe and the wall opening with a molded high density polyethylene sleeve water-stop ring, end caps and reinforcing ribs. ASTM B117, ISO 9002. Mechanical seals shall be "Thunderline" Link Seal.

2.5 CLEANOUTS

- A. For cast-iron soil pipe, iron body with extra heavy bronze plugs screwed into caulking ferrules; for steel pipe, extra heavy bronze plugs; and for vitrified clay pipe, vitrified clay plugs. Where cleanouts occur in finished interior walls, provide access panels, plates, and frames for flush mounting. Exposed parts of floor cleanouts shall have adjustable top. All cleanouts and cleanout plugs shall be accessible. Cleanout shall be the following:
 - 1. In finished floors: Cast-iron with polished nickel bronze round top, non-skid diamond tread set flush with the floor. Provide with carpet marker when located in future carpeted areas and flashing flange when used with waterproofing membrane.
 - a. Smith - 4023
 - b. Wade - W-6000

- c. Zurn - ZN-1420-2
- 2. In mechanical equipment areas: Cast-iron with heavy cast-iron round top, non-skid diamond tread set flush with the floor. Provide flashing flange when used with waterproofing membrane.
 - a. Smith - 4223
 - b. Wade - W-6000
 - c. Zurn - Z-1400
- 3. In walls: Cleanout tee with squared polished nickel bronze access plate with vandalproof screws and frames. Opening 8 inches by 8 inches minimum.
 - a. Smith - 4558-U
 - b. Wade - W-8460-S
 - c. Zurn - ZN-1447
- 4. In exterior grades: Cast-iron body, vandalproof cover, non-skid diamond tread, set flush with grade or finished surface. In non-surfaced area, they shall be cast in a concrete block 14 inches by 14 by 6 inches deep.
 - a. Smith - 4248
 - b. Wade - 6010-Z-75

2.6 FLOOR DRAINS, FLOOR SINKS, AND AREA DRAINS

A. Floor Sink (FS-1)

- 1. 12 inch square, 4 inch wide flange, 6 inch deep acid-resisting enameled cast-iron drain with stainless steel rim and grate, sediment bucket and anchor flange with membrane clamp. Provide partial grate for discharge pipes.
 - a. Smith - 3140Y
 - b. Zurn Z-1900

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to COMMON WORK RESULTS FOR PLUMBING Section 22 05 00 for piping joining materials, joint construction, and basic installation requirements.
- B. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.
 - 1. Locate backflow preventers as indicated on plans.
 - 2. Install drain for backflow preventers with fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to receptor. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.
 - 3. Do not install bypass piping around backflow preventers.

- C. Install pressure regulators with inlet and outlet shutoff valves and balance valve bypass. Install pressure gages on inlet and outlet.
- D. Install strainers on supply side of each pressure regulator, and solenoid valve.
- E. Install trap seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
- F. Install expansion joints on vertical risers, stacks, and conductors if indicated.
- G. Install cleanout deck plates with top flush with finished floor for floor cleanouts on piping below floors.
- H. Install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall, for cleanouts located in concealed piping.
- I. Install flashing flange and clamping device with each stack and cleanout passing through floors with waterproof membrane.
- J. Install vent flashing sleeves on stacks passing through roof. Secure over stack flashing according to manufacturer's written instructions.
- K. Install drains at low points of surface areas to be drained as indicated on the architectural drawings. Set grates of drains flush with finished floor, unless otherwise indicated.
- L. Install roof drains at low points of roof areas as indicated on the architectural Drawings.
- M. Fasten wall-hanging plumbing specialties securely to supports attached to building substrate if supports are specified and to building wall construction if no support is indicated.
- N. Fasten recessed-type plumbing specialties to reinforcement built into walls.
- O. Install blocking reinforcement for wall-mounting and recessed-type plumbing specialties.
- P. Install individual shutoff valve in each water supply to plumbing specialties. Use ball, gate, or globe valve if specific valve is not indicated. Install shutoff valves in accessible locations. See GENERAL-DUTY VALVES Section 22 05 23 for general-duty ball, butterfly, check, gate, and globe valves.
- Q. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Connect plumbing specialties to piping specified in other Division 22 Sections.
- D. Connect plumbing specialties and devices that require power conforming to Division 22 Sections.

3.3 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Department maintenance personnel to adjust, operate, and maintain plumbing specialties.

END OF SECTION

SECTION 22 13 16 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. SANITARY WASTE AND VENT PIPING consists of furnishing transportation, labor, materials, and equipment to furnish and install the following for soil, waste, and vent piping inside the building:
 - 1. Pipe and fittings.
 - 2. Special pipe fittings.
 - 3. Encasement for underground metal piping.

1.2 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1, apply to this Section.
- B. COMMON WORK RESULTS FOR PLUMBING - Section 22 05 00

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM International)
- B. American Water Works Association (AWWA)
- C. Cast Iron Soil Pipe Institute (CISPI)
- D. Sheet Metal and Air Condition Contractor's National Association (SMACNA)

1.4 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.
- B. Seismic Performance: Soil, waste, and vent piping and support and installation shall be in conformance with the SMACNA Guidelines.

1.5 SUBMITTALS

- A. Product Data: For pipe, tube, fittings, and couplings.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Codes and Standards:
 - 1. All governing Codes, Ordinances and Agencies in accordance with the provisions of Division 1 of these specifications.

PART 2 - PRODUCTS

2.1 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings:

1. Soil, waste, vent and storm drain piping to 5 feet outside building: Cast-iron soil pipe and fittings conforming to the requirements of CISPI Standard 301, ASTM A888 or ASTM A74 for all pipe and fittings. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute or receive prior approval of the Engineer. Wrap all underground piping per paragraph 3.3 G, 1 herein.
 - a. Manufacturers:
 - 1) Tyler Pipe
 - 2) A.B. & I.
 - 3) Charlotte Pipe and Foundry
- B. Shielded Couplings: ASTM C1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
 1. Above Ground: Type 300 Series stainless steel, "No-Hub" standard duty, shielded couplings as approved by the Cast Iron Soil Pipe Institute, CISPI-310-85 with stainless steel corrugated shield, stainless steel bands and tightening devices and ASTM C564 rubber sleeve. Equivalent to Tyler.
 2. Below Ground: Type 304 stainless steel, "No-Hub" by the Cast Iron Soil Pipe Institute, CISPI-310-85 with stainless steel shield, stainless steel band and tightening devices and ASTM C564 rubber sleeve. Equivalent to Husky HD-2000.
 - a. Manufacturers:
 - 1) Clamp-All Corporation
 - 2) Husky Technologies.
 - 3) Tyler Pipe; Soil Pipe Division

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Refer to EARTHWORK and TRENCHING AND BACKFILLING Sections for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

- A. Soil and waste piping shall be hubless cast-iron soil pipe and fittings; standard-duty shielded, stainless-steel couplings; and hubless-coupling joints.
- B. Vent piping shall be hubless cast-iron soil pipe and fittings; standard, shielded, stainless-steel couplings; and hubless-coupling joints.

3.3 PIPING INSTALLATION

- A. Sanitary sewer piping outside the building is specified in civil drawings.
- B. Basic piping installation requirements are specified in COMMON WORK RESULTS FOR PLUMBING Section 22 05 00.
- C. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.

- D. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in PLUMBING SPECIALTIES Section 221119.
- E. Install wall-penetration fitting at each service pipe penetration through foundation wall. Make installation watertight.
- F. Install cast-iron soil piping in conformance with CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Where soil is corrosive install 8 mil. Polyethylene encasement on underground piping in conformance with ASTM A674 or AWWA C105/ANSI AZ1.5. Backfill with clean sand a minimum of 4 inches all around pipe and fittings.
- G. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- H. Install soil and waste drainage piping at 2 percent minimum slope, unless otherwise indicated on Drawings:
- I. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.4 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in COMMON WORK RESULTS FOR PLUMBING Section 220500.
- B. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.

3.5 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint devices are specified in NOISE, VIBRATION AND SEISMIC CONTROLS Section 220548.
- B. Pipe hangers and supports are specified in HANGERS AND SUPPORTS FOR PLUMBING PIPING & EQUIPMENT Section 220529. Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Install individual, straight, horizontal piping runs in conformance with to the following:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet, if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.

- C. Install supports according to Hangers and Supports Section.
- D. Support vertical piping and tubing at base and at each floor.
- E. Horizontal cast-iron no-hub piping: Provide hangers or supports at each side of a no-hub fitting.
- F. Install hangers for cast-iron soil piping with maximum horizontal spacing and minimum rod diameters in accordance with the requirements of the California Plumbing Code.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
 - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by the CPC.
 - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by the CPC.
 - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by the CPC.

3.7 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
 - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Re-inspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of the authorities having jurisdiction or, in absence of published procedures, in accordance with the requirements of the California Plumbing Code.

3.8 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION

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SECTION 22 33 00 - ELECTRIC WATER HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following electric water heaters:
 - 1. Commercial, storage electric water heaters.
 - 2. Compression tanks.
 - 3. Water heater accessories.

1.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Commercial domestic-water heaters shall withstand the effects of earthquake motions determined according to SMACNA Guidelines.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified".

1.4 SUBMITTALS

- A. Product Data: For each type and size of water heater indicated. Include rated capacities, operating characteristics, furnished specialties, and accessories.
- B. Operation and Maintenance Data: For electric water heaters to include in emergency, operation, and maintenance manuals.
- C. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain same type of electric water heaters through one source from a single manufacturer.
- B. Product Options: Drawings indicate size, profiles, and dimensional requirements of electric water heaters and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. ASME Compliance: Where indicated, fabricate and label commercial water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 01.
- E. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9," for all components that will be in contact with potable water.
- F. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

1.6 COORDINATION

- A. Coordinate size and location of concrete bases with Architectural and Structural Drawings.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric water heaters that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including storage tank and supports.
 - b. Faulty operation of controls.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal use.
 - 2. Warranty Period(s): From date of Substantial Completion:
 - a. Commercial Electric Water Heaters:
 - 1) Storage Tank: Three years.
 - 2) Controls and Other Components: Three years.
 - b. Compression Tanks: One year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 COMMERCIAL ELECTRIC WATER HEATERS

- A. Commercial, Storage Electric Water Heaters: Comply with UL 1453 requirements for storage-tank-type water heaters.
 - 1. Manufacturers:
 - a. Bradford White Corporation.
 - b. Lochinvar Corporation.
 - c. A.O. Smith.
 - 2. Storage-Tank Construction: Non-ASME-code, steel vertical arrangement, glass lined.
 - a. Tappings: Factory fabricated of materials compatible with tank and piping connections. Attach tappings to tank before testing.
 - 1) NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.
 - 2) NPS 2-1/2 and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges, and according to ASME B16.24 for copper and copper-alloy flanges.
 - b. Pressure Rating: 150 psig.
 - c. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending lining material into tappings.

3. Factory-Installed Storage-Tank Appurtenances:
 - a. Anode Rod: Extruded high density.
 - b. Drain Valve: Corrosion-resistant metal complying with ASSE 1005.
 - c. Insulation: Comply with ASHRAE/IESNA 90.1.
 - d. Jacket: Steel with enameled finish.
 - e. Heating Elements: Medium watt density with zinc-plated copper sheath.
 - f. Temperature Control: Adjustable thermostat.
 - g. Safety Controls: High-temperature-limit and low-water cutoff devices or systems.
 - h. Relief Valves: ASME rated and stamped and complying with ASME PTC 25.3, for combination temperature and pressure relief valves. Include one or more relief valves with total relieving capacity at least as great as heat input, and include pressure setting less than water heater working-pressure rating. Select one relief valve with sensing element that extends into storage tank.
4. Special Requirements: NSF 5 construction.
5. Capacity and Characteristics:
 - a. As indicated on Plumbing Drawings.

2.3 COMPRESSION TANKS

- A. Description: Steel pressure-rated tank constructed with welded joints and factory-installed butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.
 1. Manufacturers:
 - a. AMTROL Inc.
 - b. Watts Regulator Co.
 - c. Wessels Co.
 2. Construction:
 - a. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1, pipe thread.
 - b. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
 - c. Air-Charging Valve: Factory installed.
 3. Capacity and Characteristics:
 - a. Working-Pressure Rating: 150 psig.
 - b. Capacity Acceptable: 2 gal. minimum.
 - c. Air Precharge Pressure: 55 psig.

2.4 WATER HEATER ACCESSORIES

- A. Combination Temperature and Pressure Relief Valves: ASME rated and stamped and complying with ASME PTC 25.3. Include relieving capacity at least as great as heat input, and include

pressure setting less than water heater working-pressure rating. Select relief valves with sensing element that extends into storage tank.

- B. Pressure Relief Valves: ASME rated and stamped and complying with ASME PTC 25.3. Include pressure setting less than water heater working-pressure rating.
- C. Water Heater Stands: Water heater manufacturer's factory-fabricated steel stand for floor mounting and capable of supporting water heater and water. Include dimension that will support bottom of water heater a minimum of 18 inches above the floor.
- D. Water Heater Restraint System: Heavy duty water heater seismic restraint system for wall mounting. Install per Manufacturer's direction and detail on plan.
- E. Drain Pans: Corrosion-resistant metal with raised edge. Include dimensions not less than base of water heater and include drain outlet not less than NPS 3/4.

2.5 SOURCE QUALITY CONTROL

- A. Test and inspect water heater storage tanks, specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.
- B. Hydrostatically test water heater storage tanks before shipment to minimum of one and one-half times pressure rating.
- C. Prepare test reports.

PART 3 - EXECUTION

3.1 WATER HEATER INSTALLATION

- A. Install commercial water heaters on concrete bases.
 - 1. Exception: Omit concrete bases for commercial water heaters if installation on stand, bracket, suspended platform, or direct on floor is indicated.
 - 2. Concrete base construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Install water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
- C. Install seismic restraints for commercial water heaters. Anchor to substrate.
- D. Install combination temperature and pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic water piping in continuous downward pitch, and discharge by positive air gap above floor sink.
- E. Install water-heater drain piping as indirect waste to spill by positive air gap over floor sinks. Install hose-end drain valves at low points in water piping for water heaters that do not have tank drains. Refer to Division 22 Section "Plumbing Specialties" for hose-end drain valves.
- F. Install thermometer on outlet piping of water heaters. Refer to Division 22 Section "Meters and Gages for Plumbing Piping" for thermometers.
- G. Fill water heaters with water.
- H. Charge compression tanks with air.

3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to water heaters to allow service and maintenance. Arrange piping for easy removal of water heaters.
- C. Ground equipment and connect wiring according to Division 26 Section "General Electrical Specification."

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- B. Perform the following field tests and inspections and prepare test reports:
 - 1. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Operational Test: After electrical circuitry has been energized, confirm proper operation.
 - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Remove and replace water heaters that do not pass tests and inspections and retest as specified above.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain commercial and instantaneous electric water heaters. Refer to Division 01 Section "Closeout Procedures, Demonstration and Training."

END OF SECTION

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SECTION 22 40 00 -PLUMBING FIXTURES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. PLUMBING FIXTURES consists of furnishing transportation, labor, materials, and equipment to furnish and install the following plumbing fixtures and related components:
 - 1. Faucets
 - 2. Flushometers
 - 3. Toilet seats
 - 4. Protective shielding guards
 - 5. Fixture supports
 - 6. Water closets
 - 7. Urinals
 - 8. Lavatories
 - 9. Drinking Fountains

1.2 RELATED documents.

- A. PLUMBING SPECIALTIES - Section 22 11 19
- B. COMMON WORK RESULTS FOR PLUMBING - Section 22 05 00

1.3 DEFINITIONS

- A. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.
- B. Fitting: Device that controls the flow of water into or out of the plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, shower heads and tub spouts, drains and tailpieces, and traps and waste pipes. Piping and general-duty valves are included where indicated.
- C. Solid Surface: Nonporous, homogeneous, cast-polymer-plastic material with heat-, impact-, scratch-, and stain-resistance qualities.

1.4 SUBMITTALS

- A. Manufacturer's Literature: Submit brochures on all materials and equipment to the Architect.
- B. Other Submittals:
 - 1. Operations and Maintenance Manuals.
 - 2. Sterilization test report
 - 3. test data.
 - 4. record drawings

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category through one source from a single manufacturer.
 - 1. Exception: If fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for that category.
- B. Codes and Standards:
 - 1. All governing codes, ordinances and agencies, in accordance with the provisions of Division 1 of these specifications.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Flushometer-Valve Repair Kits: Equal to 10 percent of amount of each type installed, but no fewer than five of each type.
 - 2. Faucet Washers and O-Rings: Equal to 10 percent of amount of each type and size installed.
 - 3. Faucet Cartridges and O-Rings: Equal to 5 percent of amount of each type and size installed.

PART 2 - PRODUCTS

2.1 ACCESSIBILITY

- A. Plumbing fixtures and accessories provided in a toilet room or bathing room required to comply with CBC Section 11B-213.2 shall comply with Section 11B-213.3. Each toilet shall comply with Section 11B-603.
- B. Accessible plumbing fixtures shall comply with all the requirements in CBC Division 6 – Plumbing Elements and Facilities.
- C. Clearance around accessible water closets and in toilet compartments shall be 60 inches minimum measured perpendicular from the side wall and 56 inches minimum measured perpendicular from rear wall per CBC Section 11B-604.3.1.
- D. Heights and location of all accessible fixtures shall be mounted according to CBC Section 11B-602 through 11B-612.
- E. Accessible fixture controls shall comply with Section 11B-602.3 for drinking fountains, 11B-604.6 for water closets, 11B-604.9.5 for children's water closets, 11B-605.4 for urinals, 11B-606.4 for lavatories and sinks, 11B-607.5 for bathtubs, 11B-608.5 for showers, and 11B-611.3 for washing machines and clothes dryers.
- F. Accessible lavatories and sinks shall be 6 ½" deep maximum. Sinks shall be mounted with the front of the higher of the rim or counter surface 34" maximum above the finish floor or ground.
- G. Depth of lavatories or sinks shall not interfere with knee and toe clearance provided in accordance with CBC Section 11B-306 when a forward approach is required. CBC Sections 11B-606.3 and 11B-606.7.
- H. Water supply and drain pipes under accessible lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under accessible lavatories and sinks. CBC Section 11B-606.5.

- I. For mounting heights installation of plumbing fixtures, refer to architectural plans.

2.2 MANUFACTURERS

- A. Flush Valves: As specified.
- B. Plumbing Fixtures: As specified.
- C. Toilet Seats: As specified
- D. Faucets: As specified.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before plumbing fixture installation.
- B. Examine cabinets, counters, floors, and walls for suitable conditions where fixtures will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.
- B. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.
 - 1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
 - 2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
- C. Install back-outlet, wall-mounting fixtures onto waste fitting seals and attach to supports.
- D. Install wall-mounting fixtures with tubular waste piping attached to supports.
- E. Install under counter-mounting fixtures and attached to casework.
- F. Install fixtures level and plumb according to roughing-in drawings.
- G. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
- H. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- I. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.
- J. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.
- K. Install toilet seats on water closets.
- L. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

- M. Install water-supply flow-control fittings with specified flow rates in fixture supplies at stop valves.
- N. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- O. Install traps on fixture outlets.
 - 1. Exception: Omit trap on fixtures with integral traps.
- P. Install escutcheons at piping wall ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings.
- Q. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

3.4 FIELD QUALITY CONTROL

- A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.
- B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.
- C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.
- D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.
- E. Install fresh batteries in sensor-operated mechanisms.

3.5 ADJUSTING

- A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.
- B. Adjust water pressure at faucets and flushometer valves to produce proper flow and stream.
- C. Replace washers and seals of leaking and dripping faucets and stops.

3.6 CLEANING

- A. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
 - 1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
 - 2. Remove sediment and debris from drains.
- B. After completing installation of exposed, factory-finished fixtures, faucets, and fittings, inspect exposed finishes and repair damaged finishes.

3.7 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Engineer.

END OF SECTION

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