

Project Manual

RENOVATIONS AT LIBRARY AND MEDIA CENTER

Walnut High School

Walnut Valley Unified School District

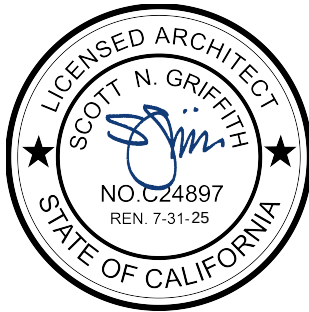


SGH Architects, Inc.
707 Brookside Avenue
Redlands, CA 92373
(909) 375-3030

SGH Architects Project #22-47104-00

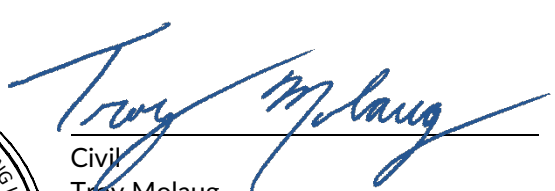
August 2024

WALNUT HIGH SCHOOL
RENOVATIONS AT LIBRARY AND MEDIA CENTER
WALNUT VALLEY UNIFIED SCHOOL DISTRICT

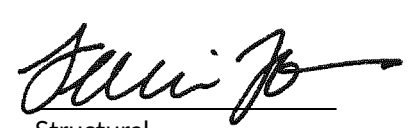


Architect
Scott Griffith, AIA
SGH Architects, Inc.
707 Brookside Avenue
Redlands, CA 92373
(909) 375-3030
sgriffith@sgharch.com




Civil
Troy Molaug
EPIC Engineers
101 E. Redlands Blvd., Suite 146
Redlands, CA 92373
(909) 792-5969
troy@epicrce.com




Structural
Les Tso, S.E.
Hohbach-Lewin, Inc.
511 Mission St.
South Pasadena, CA 91030
(626) 334-0935
ltso@hohbach-lewin.com



Mechanical/Plumbing
Eric DeSplinter
Astral Engineers
P.O. Box 190
Rancho Cucamonga, CA 91729
(909) 566-0717
Eric.desplinter@astraleng.com



Electrical/Fire Alarm/Technology
James Lessard
Astral Engineers
P.O. Box 190
Rancho Cucamonga, CA 91729
(909) 566-0717
james.lessard@astraleng.com

WALNUT HIGH SCHOOL
RENOVATIONS AT LIBRARY AND MEDIA CENTER
WALNUT VALLEY UNIFIED SCHOOL DISTRICT

COVER SHEET

SEALS SHEET

TABLE OF CONTENTS

DIVISION 01 GENERAL REQUIREMENTS

01 10 00	SUMMARY OF WORK
01 20 00	PRICE AND PAYMENT PROCEDURES
A 01 20 00.1	DISTRICT STANDARD PAY APPLICATION & CONTINUATION SHEET
01 26 10	REQUESTS FOR INFORMATION (RFI)
A 01 30 00	ADMINISTRATIVE REQUIREMENTS
01 30 00	ADMINISTRATIVE REQUIREMENTS (BIM MODEL REQUEST FORM)
01 31 16.13	NETWORK ANALYSIS SCHEDULES
01 33 00	SUBMITTAL PROCEDURES
01 35 16	ALTERATIONS PROJECT PROCEDURES
01 35 42	CAL GREEN REQUIREMENTS
01 40 00	QUALITY REQUIREMENTS
01 50 00	TEMPORARY FACILITIES AND CONTROLS
01 57 20	CONTROL OF CONSTRUCTION NOISE
01 57 23	STORM WATER POLLUTION CONTROL
01 60 00	PRODUCT REQUIREMENTS
01 70 00	EXECUTION REQUIREMENTS
A 01 74 19	CONSTRUCTION WASTE MANAGEMENT
01 78 00	CLOSEOUT SUBMITTALS
01 79 00	DEMONSTRATION AND TRAINING
01 80 00	FACILITY OPERATION

DIVISION 02 EXISTING CONDITIONS

02 41 19	SELECTIVE DEMOLITION

DIVISION 3 CONCRETE

03 10 00	CONCRETE FORMING AND ACCESSORIES
03 20 00	CONCRETE REINFORCING
03 30 00	CAST IN PLACE CONCRETE
03 35 00	CONCRETE FLOOR FINISHING

DIVISION 04 MASONRY

04 21 00	CLAY UNIT MASONRY

DIVISION 05 METALS

05 12 00	STRUCTURAL STEEL
05 50 00	METAL FABRICATIONS
05 52 13	PIPE & TUBE RAILINGS

DIVISION 06 WOOD, PLASTICS, AND COMPOSITES

06 10 00	ROUGH CARPENTRY
06 20 00	FINISH CARPENTRY – INSTALLATION OF DOORS
06 41 16	CASEWORK
06 61 16	SOLID POLYMER FABRICATION

A DIVISION 07 THERMAL AND MOISTURE PROTECTION

07 01 00	ROOF REPAIRS
07 01 50.76	FOAM ROOF REPAIRS
07 21 00	INSULATION
07 26 13	WEATHR RESISTIVE, AIR BARRIERS
07 26 16	VAPOR BARRIER
07 62 00	SHEET METAL FLASHING AND TRIM
07 72 00	ROOF ACCESSORIES
07 81 23	INTUMESCENT FIRE PROTECTION
07 84 00	FIRESTOPPING
07 84 13	FIRESTOPPING WIRING DEVICES
07 92 00	JOINT SEALANTS
07 95 13	INTERIOR EXPANSION JOINT COVER ASSEMBLIES

DIVISION 08 OPENINGS

08 12 13	HOLLOW METAL FRAMES – WELDED
08 14 16	FLUSH WOOD DOORS
08 31 13	ACCESS DOORS
08 41 00	EXTERIOR ALUMINUM ENTRANCE DOORS
08 41 13	INTERIOR ALUMINUM STOREFRONTS
08 43 29	INTERIOR SLIDING STOREFRONTS
08 71 00	DOOR HARDWARE
08 71 00	DOOR HARDWARE MATRIX
08 80 00	GLAZING

DIVISION 09 FINISHES

09 05 61	COMMON WORK RESULTS FOR FLOORING PREPARATION
09 29 00	GYPSUM BOARD
09 30 13	CERAMIC TILE
09 51 00	ACOUSTICAL CEILINGS-LAY-IN
09 53 23	ACOUSTICAL SUSPENSION SYSTEMS
09 54 26	SUSPENDED LINEAR WOOD CEILINGS
09 54 34	SUSPENDED MODULAR CEILING PANELS
09 54 45	SUSPENDED FELT BAFFLES
09 65 13	RESILIENT BASE
09 65 45	VINYL TILE FLOORING – LVT
09 68 13	TILE CARPETING
09 72 70	TACKABLE WALL COVERING
09 90 00	PAINTING
09 96 46	INTUMESCENT PAINTING

DIVISION 10 SPECIALTIES

10 14 00	IDENTIFICATION SIGNS
10 14 23	SIGNS – RESTROOMS
10 14 33	EXIT SIGNAGE
10 22 33	FOLDING PANEL PARTITIONS
10 26 17	WALL PROTECTION
10 28 00	TOILET ACCESSORIES
A 10 44 13	FIRE EXTINGUISHERS AND CABINETS
10 56 26	MOBILE STORAGE SHELVING

DIVISION 11 EQUIPMENT

11 52 23	AUDIO-VISUAL EQUIPMENT SUPPORTS

DIVISION 12 FURNISHINGS

12 24 13	ROLLER SHADES

DIVISION 22 PLUMBING

22 05 00	BASIC PLUMBING REQUIREMENTS
22 05 05	PLUMBING DEMOLITION
22 05 23	GENERAL-DUTY VALVES FOR PLUMBING PIPING
22 05 29	HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 05 53	PLUMBING IDENTIFICATION
22 07 19	PLUMBING PIPING INSULATION
22 10 05	PLUMBING PIPING
22 40 00	PLUMBING FIXTURES

DIVISION 23 HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

23 05 00	MECHANICAL GENERAL REQUIREMENTS
23 05 05	MECHANICAL DEMOLITION
23 05 93	TESTING, ADJUSTING, AND BALANCING FOR HVAC
23 07 13	DUCT INSULATION
23 31 00	HVAC DUCTWORK
23 33 00	AIR DUCT ACCESSORIES
23 34 23	HVAC POWER VENTILATORS
23 37 00	AIR OUTLETS AND INLETS

DIVISION 26 ELECTRICAL

A 26 05 00	ELECTRICAL GENERAL REQUIREMENTS
26 05 05	ELECTRICAL DEMOLITION
26 05 19	VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 29	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33.13	CONDUIT FOR ELECTRICAL SYSTEMS
26 05 33.16	BOXES FOR ELECTRICAL SYSTEMS

26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 09 23	LIGHTING CONTROL DEVICES
26 27 26	WIRING DEVICES
26 51 00	INTERIOR LIGHTING

DIVISION 27 COMMUNICATIONS

27 05 00	TECHNOLOGY GENERAL REQUIREMENTS
27 10 00	STRUCTURED CABLING
27 53 13	CLOCK SYSTEMS

DIVISION 28 ELECTRONIC SAFETY AND SECURITY

28 05 00	FIRE ALARM GENERAL REQUIREMENTS
28 46 00	FIRE DETECTION AND ALARM

DIVISION 31 EARTHWORK

31 10 00	SITE CLEARING
31 22 00	GRADING
31 23 16	EXCAVATION
31 23 16.13	TRENCHING
31 23 23	FILL

DIVISION 32 EXTERIOR IMPROVEMENTS

32 11 23	AGGREGATE BASE COURSES
32 12 16	ASPHALT PAVING
32 13 13	CONCRETE PAVING
32 17 23.13	PAINTED PAVEMENT MARKINGS
32 17 26	DETECTABLE WARNING SURFACING

DIVISION 33 UTILITIES

33 41 11	SITE STORM DRAINAGE SYSTEM

END OF TABLE OF CONTENTS

SECTION 01 10 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY OF WORK

- A. This Contract includes work necessary for and incidental to execution and completion of

WALNUT HIGH SCHOOL
RENOVATIONS AT LIBRARY AND MEDIA CENTER
WALNUT VALLEY UNIFIED SCHOOL DISTRICT
WALNUT, CA

in accordance with Contract Documents Dated April, 30 2024, prepared by SGH Architects, Inc., 707 Brookside Ave., Redlands, CA 92373

1.2 GENERAL DESCRIPTION OF WORK

- A. Work under this Contract includes furnishing all labor, materials, services, transportation, and connection to existing utilities except as specifically excluded which is required for completion of Project in accordance with provisions of Contract Documents.
- B. Work to be included as part of this Contract:
1. Renovation to existing building A – Library at existing Walnut High School campus. Work also includes associated site improvements.
- C. The following restrictions apply to access and to use of site:
1. Use of Site: Limit use of premises to Work in areas indicated. Confine operations to areas within Contract limits indicated. Do not disturb portions of site beyond areas in which Work is indicated. Allow for Owner occupancy and use by public.
 2. Driveways and Entrances: Keep driveways and entrances serving premises clear and accessible to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment onsite.
 3. Full Owner Occupancy: Owner will occupy site and existing buildings during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform Work so as not to interfere with Owner's operations.

1.3 PERMISSIBLE WORKING DAYS AND HOURS

- A. Work may be conducted on regularly scheduled days between the hours of 7:00 A.M. through 4:00 P.M. Unless otherwise arranged with the district.

**SECTION 01 10 00
SUMMARY OF WORK**

- B. Work may be conducted at any hour during Saturdays, Sundays and non-school session days, at no extra cost to the Owner, when written notification to Owner has been submitted and anticipated schedule of Work activities has been approved.
- C. Conform to Division 01, General Requirements for required payment for Inspector's services performed during overtime hours.

1.4 INTERRUPTION OF EXISTING UTILITY SERVICES

- A. When necessary to interrupt any existing utility service to make connections, minimum of 48 hours advance notice shall be given to Owner and Architect. Interruptions in utility services shall be of shortest possible duration for Work at hand and shall be approved by Architect.
- B. In event any utility service is interrupted without required 48 hours' notice, Contractor shall be financially liable for all damages suffered by Owner due to unauthorized interruption.

1.5 VERIFICATION OF EXISTING CONDITIONS

- A. Contractor shall be responsible to examine premises of Work and after investigation to decide for himself/herself character of materials, equipment and utilities to be encountered and all other existing conditions affecting Work. Contractor is also responsible to provide sufficient costs to cover provisions of all items of Work under existing conditions referred to herein.

PART 2 - PRODUCTS

2.1 NOT USED.

PART 3 - EXECUTION

3.1 NOT USED.

END OF SECTION

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.

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

- 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 Construction Manager 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 Construction Manager 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

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

insurance. On projects of more than one building, list buildings separately. List mechanical, 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.

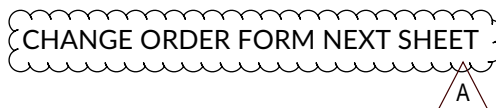
PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.0 NOT USED

END OF SECTION



CHANGE ORDER FORM

PROJECT: WALNUT HIGH SCHOOL
RENOVATIONS AT LIBRARY AND MEDIA
CENTER

CHANGE ORDER NUMBER:
DATE:

CONTRACTOR:

ARCHITECT'S PROJECT NO: 22-47104-00
CONTRACT DATE:
CONTRACT FOR:
DSA APPLICATION NO:
DSA FILE:
DLA APPLICATION:

Pursuant to Article 60 of the General Conditions, this Change Order Form shall be used for all Change Orders associated with the Work. No additions or deletions to this form shall be allowed, except with permission of the District.

You are hereby directed to provide the extra work necessary to comply with this Change Order.

DESCRIPTION OF CHANGE:

Contractor accepts the terms and conditions stated as full and final settlement of any and all claims arising from this Change Order. Contractor agrees to perform the above-described work in accordance with the above terms and in compliance with applicable sections of the Contract Documents. The amount of the changes under this Change Order is limited to the charges allowed under article 60 of the General Conditions. The adjustment in the contract sum, if any, and the adjustment in the contract time, if any, set out in this Change Order shall constitute the entire compensation and/or adjustment in the contract time and contract sum due to Contractor arising out of the change in the work covered by this Change Order, unless otherwise provided in this Change Order. It is understood that this Change Order shall be effective when approved by the Governing Board of the District. In signing below, Contractor covenants that it has complied with the signature requirements described in Paragraph 4 of the Information for Bidders.

NOT VALID UNTIL SIGNED BY THE OWNER, ARCHITECT AND CONTRACTOR

The original contract sum was _____
Net by previously authorized Change Orders _____
The Contract Sum prior to this Change Order was _____
The Contract Sum will be changed by this Change Order in the amount of _____
The new Contract Sum including this Changer Order will be _____

The Contract Time will be (increased) (decreased) (unchanged by) _____
The date of Substantial Completion as of the date of this Change Order therefore is _____

ARCHITECT:
SGH Architects
707 Brookside Avenue
Redlands, CA 92373

CONTRACTOR:

OWNER:

Scott Griffith, AIA

Date: _____

Date: _____

Date: _____

APPLICATION AND CERTIFICATE FOR PAYMENT

WVUSD Form 1104

TO OWNER: **Walnut Valley Unified School District**
880 South Lemon Ave
Walnut, CA 91789

PROJECT:

APPLICATION NO.
PERIOD TO:
PROJECT NO:

FROM CONTRACTOR:

VIA ARCHITECT:

CONTRACT DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703 is attached.

1. ORIGINAL CONTRACT SUM..... \$ -

2. Net Change by Change Orders..... \$ -

3. CONTRACT SUM TO DATE(Line 1 + 2)..... \$0.00

4. TOTAL COMPLETED & STORED TO DATE..... \$ -

5. RETAINAGE:

a. 5% of Completed Work \$ -

(Columns D + E on continuation sheet)

b. ___% of Stored Material #REF!

(Column F on continuation sheet)

Total Retainage (Line 5a + 5b or #REF!

Total in Column I on continuation sheet..... #REF!

6. TOTAL EARNED LESS RETAINAGE..... #REF!
(Line 4 less Line 5 Total)

7. LESS PREVIOUS CERTIFICATES FOR PAYMENT

(Line 6 from prior Certificate)..... \$ -

8. CURRENT PAYMENT DUE..... #REF!

9. BALANCE TO FINISH, INCLUDING RETAINAGE

(Line 3 less Line 6) #REF!

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for the Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR: By: _____ Date: _____

Subscribed and sworn before me this _____ day of _____, 2021

Notary Public in and for the State of California - My Commission Expires _____

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED.....\$ _____ #REF!

(Attach explanation if amount certified differs from the amount applied for. Initial all figures on this Application and on the Continuation Sheet that are changed to conform to the amount certified)

ARCHITECT: By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Insurance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner		
Total approved this Month		
TOTALS		
Net CHANGES BY Change Order		

Recommend for Payment:

IOR: _____ Date: _____

Project Manager: _____ Date: _____

Director of MOT&F: _____ Date: _____

Approved For Payment:

Assistant Superintendent: _____ Date: _____

[illegible]

[illegible]

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Project Management and Coordination: Project Coordination, Mechanical and Electrical Coordination, Project Meetings.
- B. Construction Progress Documentation: Construction Progress Schedule, Two-week Look Ahead Schedule, Construction Photographs.
- C. Submittal Procedures: Shop Drawings, Product Data, Samples, Source Quality Control Reports, Finishes Materials Schedule, Coordinated Drawings.

1.2 PROJECT COORDINATION

- A. Coordinate scheduling, submittals, and Work of various Sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and 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.
- C. Coordinate space requirements and installation of mechanical and electrical Work that 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 installation, for maintenance, and for repairs.
- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and conduit wiring within new and new furred wall surfaces of existing construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and cleanup of Work of separate sections in preparation for Certified Completion and for portions of Work designated for Owner's occupancy.
- F. 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.

1.3 MECHANICAL AND ELECTRICAL COORDINATION

- A. Carefully coordinate interface between Divisions 21, 22, 23, 26 and Division 28, before submitting any equipment for review or commencing installation.
- B. Control Wiring:

1. Consists of wiring in pilot circuits of contactors and starters, sensors, controllers, relays, and wiring for valve and damper operators.
- C. Connections:
 1. Provide connections to controls directly attached to ducts, piping and mechanical equipment with flexible connections.
- D. Starters:
 1. Provide magnetic starters or adjustable frequency drives for three phase motors and equipment complete with:
 - a. Control transformers.
 - b. 120 V holding coil.
 - c. Integral hand-off-auto switch.
 - d. Auxiliary contacts required for system operation plus one (1) spare.
- E. Control Voltage:
 1. Maximum allowable control voltage 120V/208V. Fully protect control circuit conductors in accordance with California Electrical Code.

1.4 PRECONSTRUCTION MEETING

- A. Architect will schedule meeting after Notice of Award.
- B. Attendance Required: Architect, Prime Contractors, Major Subcontractors, Project Inspector and key Owner personnel.
- C. Agenda:
 1. Contract Agreement:
 - a. Transmit 5 signed originals of the Agreement to the Owner.
 - b. Transmit Attachment Certifications to the Owner.
 - c. Transmit Performance and Payment Bonds to the Owner.
 - d. Contractor to transmit Certificates of Insurance to the Owner.
 - e. Owner to transmit copy of Certificates of Property Insurance to Contractor,
 - f. Review General Conditions.
 2. Receive documentation from Contractor:
 - a. Construction Progress Schedule.
 - b. Schedule of Values.
 - c. List of Subcontractors with addresses and phone numbers.
 - d. List of Submittals and estimated date of submittal.

3. Project Administration:
 - a. Application for Payment, Stop-Notice Release, Record Drawings.
 - b. Change Order Requests, Change Orders, Request For Proposals, Construction Change Directive/Instruction Bulletins. Preparation of Change Orders by Architect according to 2022 California Administrative Code, Code of Regulations Title 24 Part 1, Section 4-233
 - c. Submittals
 - d. Substitution procedures.
 - e. Site Meetings.
 - f. Testing Laboratory.
 - g. Verified Reports.
 - h. Phasing,
 - i. Critical work sequencing and long-lead items.
 - j. Designation of key personnel and their duties.
 - k. Lines of communications.
 - l. Procedures for RFIs.
 - m. Procedures for testing and inspecting.
 - n. Distribution of the Contract Documents.
 - o. Preparation of record documents.
 - p. Work restrictions.
 - q. Working hours.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Storage areas.
 - w. Equipment deliveries and priorities.
 - x. Security.
 - y. Progress cleaning.
4. Special Owner Conditions:
 - a. Temporary Facilities.
 - b. Owner Occupancy.
 - c. Work by Owner.
 - d. Access to Site - Owner Contact.
5. Construction Process:
 - a. Contractor shall discuss overview of construction.
 - b. Contractor shall identify items to be selected by Architect/Owner and date selections must be made.
 - c. Contractor shall review special requirements for equipment, safety, and noise.
6. Pre-Job Conference:
 - a. Prevailing Wage Requirements.
 - b. Checklist and signatures.

- D. Architect will record minutes and distribute copies within seven days after meeting to participants and those affected by decisions made.

1.5 PROGRESS MEETINGS

- A. Architect will schedule and administer meetings throughout progress of Work as needed.
- B. Architect will make arrangement for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Project Coordinator, Prime Contractors, Major Subcontractors and Suppliers, Project Inspector, key Owner personnel and Architect as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems that impede planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Maintenance of Construction Progress Schedule.
 - 7. Corrective measures to regain projected schedules.
 - 8. Maintenance of quality and work standards.
 - 9. Effect of proposed changes on progress schedule and coordination.
 - 10. Other business relating to Work.
- E. Architect will record minutes and distribute copies within seven days after meeting to participants, and those affected by decisions made.

1.6 PREINSTALLATION MEETING

- A. When required in individual Specification Sections, convene pre-installation meeting before starting Work of Section.
- B. Require attendance of parties directly affecting, or affected by, Work of specific Section.
 - 1. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of installation, preparation and installation procedures.

- 2. Review coordination with related Work.
- E. Contractor shall record minutes and distribute copies within three days after meeting to participants, Architect and those affected by decisions made.

1.7 SUBMITTAL PROCEDURES

- A. Provide a digital copy of each submittal directly to the District and the Architect.
 - 1. Provide cover sheet that clearly identifies the contents of the submittal.
 - 2. Include SGH Architects job number as it appears on Contract Documents.
 - 3. Include Authority Having Jurisdiction application or approval number.
- B. Submittal number shall use Specification Section followed by a hyphen and then the revision number (e.g., 05 12 00-00. Resubmittals shall have the original number and include the revision number as the suffix (e.g., 05 12 00-01).
- 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 individual 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 according to requirements of Work and Contract Documents. Stamped signatures or initials are not acceptable.
- E. Schedule submittals to expedite Project. Coordinate submission of related items.
 - 1. Make submittals according to Construction Schedule and adequate enough in advance of scheduled dates of installation to provide required time for reviews for securing necessary approvals for possible revision and re-submittal and for placing orders and securing delivery.
 - 2. Schedule submittals such that related materials and assemblies that support or are affected by the submitted materials are either submitted simultaneously or in order of installation sequence such that impacts and coordination can be evaluated as part of the review.
 - 3. Late submittals, not in accordance with the "Schedule for Submission of Shop Drawings, Product Data and Samples" and the Construction Schedule will not be considered an acceptable reason for initiating a substitution request caused by late ordering and procurement of materials.
- F. Identify variations from Contract Documents and Product or system limitations that is detrimental to performance of completed Work.

- G. Substitutions: Submit only as approved per the General Conditions and Section 01 60 00, state effect of approved substitution on construction schedule, and changes required in other work or products.
- H. Owner-Directed Substitution Approval: Substitution submittals specifically directed by Owner to be approved by the Architect for this project shall pertain to a specific item only. The Architect's stamped approval of Owner-Directed Substitution does not constitute approval for any other item, other projects or parts of project. A Change Order shall be prepared to effect the Owner's authorization of Owner-Directed Substitution.
- I. Provide space for Contractor and Architect review stamps.
- J. Revise and resubmit submittals in their entirety, identify changes made since previous submittal.
- K. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- L. Determine and verify field dimensions and conditions, materials, catalog numbers and similar data.
- M. Coordinate as required with all trades and all public agencies involved.
- N. Unless otherwise specifically authorized by Architect, make submittals in groups containing associated items within the same Section. Architect may reject partial submittals as not complying with provisions of this Section.
- O. Where individual Sections require structural calculations, prepare submittal under direction of qualified California Licensed Structural Engineer and shall bear the Engineer's stamp and signature.
- P. Format of Submittals: Submit Electronic Submittals, including but not limited to Product Data, Shop Drawings, Schedules, Certifications, tests, logs, for ease of information distribution. At Contractor's option he may submit standard printed data on reproducible media and in number of copies required per this Section and other project Sections. Identify submitted items that are applicable to the project, including any deviations, with arrows, clouds, or other distinct graphic, or in highlighted writing that can be reproduced with black and white copiers easily discernible from background information.

1.8 CONSTRUCTION PROGRESS SCHEDULE

- A. Submit Construction Progress Schedule in duplicate within 15 calendar days after the date on the Notice to Proceed for Architect's review.
 - 1. Schedule shall reflect amount of time stipulated in Agreement.
 - 2. If the Contractor proposes an earlier completion dated than stipulated in the Agreement, Change Order will be issued reflecting revised completion date at no change in Contract Sum.

- B. Revise and resubmit as required.
- C. Scheduling may utilize programs including Microsoft Project Schedule, Primavera Project Planner (P3), Primavera SureTrak Project Manager, Meridian Project Systems or similar programs addressing the requirements.
- D. Submit computer generated network analysis diagram in accordance with Section 01 31 16.13 using Critical Path Method, generally as outlined in Associated General Contractors of America (AGC) publication "Construction Planning and Scheduling", latest Edition.
- E. Indicate complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate early and late start, early and late finish, float dates and duration. Ownership of float time is shared commodity, not for exclusive use by either party. Use float time to make up Work behind schedule until float time is depleted. Submittals returned in less time than allowed by Contract, shall be used to reduce Contractor time extension requests.
- F. Indicate Milestones and target date and their activities including completion dates,
- G. No Time extensions will be granted nor delay damages paid until a delay occurs that impacts the schedule consumes all available float or contingency time available and extends the work beyond the contract completion date.
- H. Indicate estimated percentage of completion for each item of Work at each submission.
- I. Schedule for Submission of Shop Drawings, Product Data and Samples: Incorporate "Schedule for Submission of Shop Drawings, Product Data and Samples" in Construction Progress Schedule. This schedule shall include submittal dates required for shop drawings, product data, samples and product delivery dates, including Deferred Approval Items, if any, and including those items furnished by Owner. Provide time in schedule for Architect's review of submittals according to Contract Time. Allow 14 calendar days for submittals requiring consultants' review.
- J. Submit revised schedules with each Application for Payment identifying changes since previous version.
- K. As a minimum allow 15 calendar days in schedule for final inspections before final acceptance. Include time to correct punch list items prior to final acceptance.
- L. Substantially Completed buildings, alterations, additions and relocatables: in projects consisting of different buildings, alterations, additions and relocatables, scheduled to be substantially completed and delivered to the Owner for beneficial occupancy prior to Final Completion of entire project, indicate in the Construction Schedule each building, alteration, addition and relocatable progress, completion date, Punch List items and time for completion of Punch list items.
 - 1. DSA 152-Project Inspection Cards: The Inspector shall post the forms in his/her job file and shall electronically post the forms. Inspection Cards required: DSA issued 152-Project Inspection Cards for EACH building, alteration, addition, each relocatable, and one for the site work when site work is involved.

The Project Inspector is responsible to sign off applicable blocks and sections on the form as Work progresses as required in accordance with DSA Procedures. No one is allowed to modify the Project Inspection Cards except the Project Inspector.

1.9 TWO-WEEK LOOK AHEAD SCHEDULE

- A. Submit a Two Week Look Ahead Schedule and shall contain the following:
 - 1. Prepare detailed two-week schedule projections for the Work to be performed during the following weeks beyond the week it is presented at the weekly construction meeting or at the request of the Architect during the construction period.
 - 2. Be plotted in bar chart or time scale logic format and be of such size that all activity numbers and descriptions are clearly legible.
 - 3. Be sorted by sub contractor responsibility, actual start, early start and total float.
 - 4. Include activity ID, description and float for each activity.
 - 5. Include all activities, completed, in progress and scheduled to start within the time frame of the date minus one week to the data date plus two weeks.
 - 6. Schedule shall be updated and provided at each regular progress meeting for review and comparison to approved project schedule status.

1.10 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage qualified photographer [persons] to take construction photographs.
- B. Photographic Film: Medium format, 2-1/4 by 2-3/4 inches.
- C. Do not permit prints to be issued for any purpose without specific written authorization from the Architect.
- D. Digital Images: Provide images in uncompressed TIFF format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1024 by 768.
 - 1. Provide 2 sets (CD's) of copies to Owner.
- E. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.
 - 1. Identify each print with job name, location from which photograph was taken, photographer's name address and photograph number.
- F. Pre-Construction Photographs: Before starting construction, take 4 color photographs of Project site and surrounding properties from different vantage points, as directed by Architect. Show existing conditions adjacent to property.

- G. Periodic Construction Photographs: Take 4 color photographs monthly, coinciding with cut off date associated with each Application of Payment. Photographer shall select vantage points to best show status of construction and progress since last photographs were taken. Take photographs same time of day.
1. Field Office Prints: Retain 1 set of prints of periodic photographs in field office at Project site available at all times for reference. Identify photographs same as for those submitted to Architect.
 2. Final Completion Construction Photographs: Take 8 color photographs after date of Substantial Completion for submission as Project Record Documents. Architect will direct photographer for desired vantage points.
 3. Submit Construction Photographs to Owner monthly, submit before Application for Payment.

1.11 COORDINATED DRAWINGS

- A. Submit drawings that indicate routing, locations sizes, types and number of components in concealed spaces where potential conflict may occur between structures, mechanical, electrical, Automatic Fire Sprinkler System (AFSS), communications and ceiling suspension systems.
- B. Indicate locations of ceiling penetrations and surface-mounted items. Provide cross sections at areas to indicate proper support of ceilings and non-interference with work of other Sections of 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 Architect, in writing, requests for clarification or interpretations that will affect intent and/or scope of Contract Documents.
- F. Coordinated drawings shall indicate each class of Work in affected area. Drawing or written submittal shall include Contractor's recommendations for solution of any potential conflicts as well as recommendations tendered by any Work of any Section of Specifications which may be affected thereby.
- G. Submit coordinated drawings in scale of not less than $1/8" = 1'-0"$ with necessary sections and profiles at an appropriate, clearly readable enlarged scale. Submit coordinated drawings as one electronic (CD) copy and one bond (hard) copy.
- H. Architect will review submittals, make appropriate notations and comments to ensure solution meets intent of Contract Documents and then return to Contractor for implementation.
- I. Contractor shall be responsible for proper coordination of Work of Sections of Specifications in execution of coordinated drawings. Installation of materials, components or equipment under one Section of 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 Contractor that fabricators of Work involved in execution of coordinated drawings be informed, consulted and advised in sufficient advance time to arrive at solutions where no extension of contract time for extra cost to Owner will be approved due to Contractor's negligence in expeditious, timely submittal of coordinated drawings.

1.12 SHOP DRAWINGS

- A. Within 15 days from Notice to Proceed, submit to Architect for review and acceptance, "Schedule for Submission of Shop Drawings, Product Data and Samples" (Submission Schedule) listing required submittals and review dates. Schedule shall allow sufficient time for checking by Architect. Incorporate Submission Schedule in Construction Progress Schedule. Days: Calendar Days.
1. Additionally, submit all Shop Drawings, Product Data and Samples according to the following guidelines. Guidelines are provided to allow Architect and Engineers adequate time for review and is not intended to dictate contractor's means and methods:
- a. Contract of 60 to 90 days: Submit within 15 days from acceptance of Submission Schedule. Allow Architect 15 days to respond (defined as reviewed and returned). Re-submittals: allow contractor 7 days, allow Architect 10 days to respond.
 - b. Contract of 90 to 180 days: Submit within 30 days from Notice to Proceed. Allow Architect 15 days to respond. Re-submittals: allow Contractor 10 days, and Architect 15 days to respond.
 - c. Contract of 180 to 270 days: Submit within 45 days from Notice to Proceed. Allow Architect 21 days to respond. Re-submittals: allow Contractor 10 days, and Architect 15 days to respond.
 - d. Contract of 270 to 360 days: Submit within 60 days from Notice to Proceed. Allow Architect 21 days to respond. Re-submittals: allow Contractor 10 days, and Architect 15 days to respond.
 - e. Contract of 360 to 450 days: Submit within 60 days from Notice to Proceed. Allow Architect 21 days to respond. Re-submittals: allow Contractor 15 days and Architect 21 days to respond.
 - f. Contract of 450 days and longer: Contractor to schedule submittals. Allow Architect 30 days to respond. Re-submittals: allow Contractor 15 days and Architect 21 days to respond.
- B. Submit newly prepared information, drawn to accurate scale. Highlight, encircle or otherwise indicate deviations from Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to 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 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 for print submittals: 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. Contractor shall provide digital copies for review. Contractor shall review, stamp with his approval as herein required, and submit with reasonable promptness and in orderly sequence, according to Submittal Schedule, all shop drawings required by Contract Documents or subsequently by Architect as covered by modifications. Shop drawings shall be properly identified. At time of submission Contractor shall inform Architect in writing and with highlighted annotation on shop drawings of any deviation in shop drawings from requirements of Contract Documents.
- F. Stamp: Each page of shop drawings shall bear Contractor's stamp, which shall signify 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 information contained in shop drawings. Each stamp shall be accompanied by wet signature or initial of employee of Contractor who may be contacted for information. Stamped signatures or initials are not acceptable.
- G. Method of Review: Submit Electronic Shop Drawing Submittals. Identify submitted items that are applicable to the project, including any deviations, with arrows, clouds, or other distinct graphic, or in highlighted writing that can be reproduced with black and white copiers easily discernible from background information.
1. Comments or corrections will be noted on submittals and returned to Contractor, who shall identify all changes made since previous submittal and resubmit in same manner. When reviewed, submittals will be stamped and returned to Contractor Who shall make distribution of electronic copies as required.
- H. Processing Time
1. Allow enough time for submittal review, including time for re-submittals, as follows:
 - a. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.
 - b. In accordance with the Schedule for Submission of Shop Drawings, Product Data and Samples. Review of each submittal for conformance with design concept of Project and with information given in Contract Documents. Architect's review of a separate item shall not indicate acceptance of assembly in which that item functions. Allow additional time if coordination

with subsequent submittals is required.

Architect will advise Contractor when a submittal being processed must be delayed for coordination.

- c. Submittals requiring Consultants' Review: Where review of submittals by Architect's consultants is required, allow minimum 14 calendar days for review of each submittal.
- 2. Re-submittal Review: In accordance with the Schedule for Submission of Shop Drawings, Product Data and Samples for each re-submittal.
- I. Submittal of shop drawings to Architect, shall be made by Contractor with dated transmittal form or letter, and not by subcontractors or suppliers.
- J. Architect's review of shop drawings shall not relieve Contractor of responsibility for any deviation from requirements of Contract Documents unless Contractor has informed Architect in writing of such deviation at time of submission and Architect has given written acceptance to specific deviation, nor shall Architect's review relieve Contractor from responsibility for errors or omissions in shop drawings.
- K. No portion of Work requiring shop drawings shall be commenced until shop drawings have been returned with review by Architect.
- L. At Contractor's option, he may request and if Architect approves use Architect's computer-generated drawings in electronic format. Contractor's request must be in writing with list of drawings requested and BIM format required. Contractor assumes all liability for accuracy of shop drawings if he opts to use Architect's drawings. Software for BIM formats requested by Contractor not currently available to Architect will be provided by Contractor at his own expense. Complete BIM Drawing Request Form at the end of this Section for request.
 - 1. Engineers' Drawings, BIM engineers' drawings are available only at discretion of the Engineer.
 - 2. Electronic files have legal ramifications as information therein can be modified.
 - 3. In order to receive this electronic information, the "CAD and Digital Media Release Form" must be executed in its entirety, including signature by a company officer.
 - 4. Costs for processing and handling electronic files, however limited, will be \$250.00.
 - 5. Request "CAD and Digital Media Release Form" from the Architect for processing.

1.13 PRODUCT DATA

- A. Submit within time required by Shop Drawings.
- B. Provide digital copy of submittal to the District and Architect.
- C. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information unique to this Project.

- D. After review, distribute and provide copies for Record Documents.

1.14 SAMPLES

- A. Submit within time required by Shop Drawings.
- B. Submit samples to illustrate functional and aesthetic characteristics of product with integral parts and attachment devices. Coordinate sample submittals for interfacing Work.
- C. Submit samples of finishes from the full range of manufacturers' standard colors, textures and patterns for Architect selections, or in custom colors selected.
- D. Include identification on each sample with full Project information.
- E. Submit a digital copy of the sample(s), and provide a minimum of three (3) samples, or as specified in individual Sections of Specifications, two (2) of which will be retained by Architect.
- F. Reviewed samples which may be used in the Work are indicated Sections of the Specifications, two (2) of which will be retained by the Architect.
- G. Selection or rejection of samples will be determined by Architect in writing.
- H. Colors: Materials that are visually related to other finishes require that subcontractors submit their samples before normally scheduled in order that color selection can be made for other items that are scheduled to be ordered earlier in construction schedule. Complete submittal of color charts and color samples shall be made before related colors will be selected Architect. Contractor shall be responsible to coordinate submittal schedules so as not to delay Work.

1.15 FINISHES MATERIALS SCHEDULE

- A. Submit in accordance with Submittal Procedures.
- B. Submit Schedule verifying lead times of materials and products as scheduled on the Drawings.

1.16 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual Specification Sections, submit manufacturer's printed instruction for delivery, storage, assembly, installation, start-up, adjusting and finishing in quantities specified for product data.
- B. Identify conflicts between manufacturer's Instructions and contract documents.

1.17 MANUFACTURER'S CERTIFICATIONS

- A. When specified in individual Specification Sections, submit a manufacturers' certificate to the Architect for review in quantities specified for product data.
- B. Indicate that 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.

1.18 SPECIAL PROCEDURES - ACCELERATION OF THE WORK

- A. If, in judgment of Architect or Owner, it becomes necessary at any time to accelerate Work or portion thereof, Contractor, when ordered or directed by Architect or Owner, shall deploy workers in such portions of Project where directed to enable others to properly engage and carry on their work.
 - 1. If circumstances require that entire Work or portion thereof be completed at date earlier than Contract Completion Date as adjusted by change orders, Contractor, when ordered or directed by Owner or Architect, shall increase his forces, equipment, hours of work, and/or number of shifts and shall expedite delivery of materials to meet the altered completion date or dates ordered or directed. Any increase in cost to Contractor in compliance with such orders or directives will be adjusted in accordance with Contract Documents.
- B. If, in judgment of Architect or Owner, Work is behind schedule and rate of placement of work is inadequate to regain scheduled progress so as to ensure timely completion of Work or separable portion thereof, Contractor, when so informed by Architect or Owner, shall immediately take action to increase rate of Work placement.
 - 1. This shall be accomplished by any one or combination of following or other suitable measures:
 - a. An increase in working forces,
 - b. An increase in equipment or tools,
 - c. An increase in hours of work or number of shifts,
 - d. Expediting delivery of materials.
 - 2. Contractor shall, within ten (10) calendar days after being so informed, notify Architect of specific measures taken and/or planned to increase rate of progress together with estimate of when scheduled progress will be regained. Should plan of action be deemed inadequate by Architect or Owner, Contractor will take additional steps or make adjustments as necessary to his plan of action until it meets with Architect's or Owner's approval.
 - 3. Acceleration of Work will continue until scheduled progress is regained. Scheduled progress shall be established from latest revised approved progress schedule for Project.
 - 4. Timely completion will be understood as Contract Completion Date as revised by all time extensions granted at time acceleration is undertaken.
 - 5. Contractor shall not be entitled to additional compensation for additional effort he applies to Work under terms of this sub-paragraph.
- C. Any directive or order to accelerate Work will be in writing. Any directive or order terminating accelerated Work will be in writing.

1.19 PRECEDENCE

- A. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.
- B. In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:
 - 1. The Agreement.
 - 2. Addenda, with those of later date having precedence over those of earlier date.
 - 3. The General Conditions of the Contract for Construction.
 - 4. Drawings and Technical Specifications.
 - 5. In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.
 - 6. Any work called for in the Drawings and not mentioned in the Specifications, or vice versa, shall be performed as though fully set forth in both.
 - 7. Contractor shall secure written permission from, Architect before proceeding with work affected by omission or discrepancies in the Contract.
 - a. Separate sections of this Specification are arranged only for convenience of Contractor, and nothing stated herein should be misconstrued as suggesting jurisdiction over items of work by any different building trades.

1.20 SAFETY PLAN

- A. During the entire construction period, it shall be the sole responsibility of each Contractor to maintain conditions at the Project Site to meet the requirements of the Federal Occupational Safety and Health Administration (OSHA) and California Occupational regulations. This provision shall cover the Contractor's employees and all other persons working upon or visiting the site. The Contractor shall become fully informed of all applicable standards and regulations and inform all persons and representatives responsible for work under this Contract.
 - 1. Each Contractor shall submit to the Project Manager their Company Safety Plan within seven (7) calendar days following date of issuance of the letter of intent.

PART 2 - PRODUCTS

2.1 MOTOR HORSEPOWER - MECHANICAL AND ELECTRICAL COORDINATION

- A. In general, motors larger than 1/2 Hp shall be three phase, motors 1/2 Hp or less shall be single phase.
- B. Voltage and phase of motors as scheduled on electrical drawings shall take precedence in case of conflict between mechanical and electrical drawings or requirements 2 01 A., above.
- C. Under Work of Divisions 21, 22, and 23 shall include coordination of mechanical equipment with requirements of Division 26 before ordering.
 - 1. If motors' horsepower are changed under Work of Divisions 21, 22, and 23 additional electrical cost of change shall be responsibility of Divisions 21, 22, and 23. Increase or decrease motor horsepower from that specified shall not be made without written approval from Architect.

2.2 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. Refer to Section 01 70 00 Execution Requirements.

PART 3 - EXECUTION

3.1 NOT USED

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

A

WALNUT HIGH SCHOOL
RENOVATIONS AT LIBRARY AND MEDIA CENTER
WALNUT UNIFIED SCHOOL DISTRICT
SGH Project No. 22-47104-00

BIM MODEL REQUEST FORM

Date: _____

SGH Job Number: _____

Project: _____

Project Architect: _____

We _____

Contractor

Request the following listed BIM Model(s) for use in the execution of our Work under the Contract Documents of the subject project, and hereby assume all and sole responsibility of field verification and coordination with the Work of associated trades.

The Contractor further agrees, to the fullest extent permitted by law, to indemnify and hold harmless the Architect, its officers, directors, employees and subconsultants (collectively, Architect) against any damages, liabilities or costs, including reasonable attorneys' fees and defense costs, arising from or allegedly arising from or in any way connected with the unauthorized reuse or modification of the electronic files by the Contractor or any person or entity that acquires or obtains the electronic files from or through the Contractor without the written authorization of the Architect.

Model Name:	Dated	Model Title
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Requested File Format

☐ RVT (Revit - 2015)

Requested File Deliverable

☐ USB Flash Drive

☐ E-MAIL (Newforma Info Exchange)

☐ FTP (Zipped Files)

☐ CD Rom

Contractor's E-mail address

Contractors are not required to pay for the first 2 models (maximum). Additional models available at a rate of \$50.00 per model.

Total payment enclosed \$_____, (checks made payable to **SGHArchitects**).

Signed: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Contact: *SGHArchitects Inc.*
Project Manager

END OF FORM

A

SECTION 01 35 42 – CALGREEN REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section includes general requirements and procedures for compliance with 2022CALGreen nonresidential mandatory requirements.
- B. Related Sections:
 - 1. Divisions 01 through 48 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 2017 Standard Method for the Testing and Evaluation Chambers, Version 1.2, January 2017.
 - 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. Reference Standards.
- B. Quality Assurance and Control of Installation.
- C. Field Samples.
- D. Mock-up
- E. Project Inspector and Inspections.
- F. Permits and Fees.
- G. Manufacturers' Field Services and Reports.
- H. Laboratory Testing Services.

1.2 REFERENCE STANDARDS

- A. Conform to reference standards by date of issue current on date of Contract Documents.
- B. For products or workmanship specified by Association, Trade or Federal Standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.
- C. Obtain copies of standards when required by Contract Documents.
- D. Maintain copy of standards at jobsite during submittals, planning and progress of the specified Work until Certified Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, products, services, site conditions and workmanship to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions including each step-in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Perform Work by persons qualified to produce workmanship of specified quality.

- E. Where experience minimums for workmen, applicators, companies or manufacturers are required in individual Sections, written certification and documentation substantiating such minimums shall be submitted and approved by the Architect, when requested.
- F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.
- G. Field Samples
 - 1. Obtain field samples for review by Architect.
- H. Mock-Up
 - 1. Test will be performed under provisions identified in this Section.
 - 2. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals and finishes.
 - 3. Where mock-ups are specified in individual Sections, shall be removed after approval per this Section unless are to remain as part of the Work.

1.4 PROJECT INSPECTOR

- A. An Inspector, herein referred to as the "Project Inspector", "Job Inspector", or "Inspector of Record" (IOR) will be employed by the Owner approved by the Architect, Structural Engineer, and the Division of State Architect (DSA) in accordance with 2022 California Code of Regulations, Title 24, Part 1, California Administrative Code, Section 4-333(b). The Inspector of Record's duties are described in CAC Section 4-342, and DSA Procedure 13-01.
- B. Class of Inspector required for this project in accordance with Title 24, Part I, Section 4-333.1:
 - 1. Inspector of Record - projects containing new construction of a interior walls building and associated site work. Classification as noted on cover sheet.
- C. The Work of construction in all stages of progress shall be subject to the personal continuous observation of the Project Inspector. He shall have free access to any or all part of the Work at any time. 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. Inspection of the Work shall not relieve the Contractor from any obligation to fulfill this Contract.

1.5 PERMITS AND FEES

- A. Where required by the provisions of individual sections of the Specifications, and where required to carry out construction operations, Contractor shall obtain and pay for permits and fees, including, but not limited to, Demolition, Grading, Disposals, requirements of Water, Gas, Sewer, Flood and Sanitary Districts, Municipal and County Building Departments having jurisdiction.
 - 1. Fees for final utility connections shall be paid by the Contractor and reimbursed to the Contractor by the Owner at direct cost.

2. Building Permits or approvals issued by DSA requiring fees will be obtained and paid by the Owner.

1.6 VERIFIED REPORTS

- A. Contractor shall comply with CAC Sections 4-336 and 4-343 and issue verified reports through the Architect as required.

1.7 MANUFACTURERS' FIELD SERVICES AND REPORTS

- 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 of equipment and as applicable and to initiate instructions when necessary.
- B. Manufacturers' representatives shall report observations and site decisions, or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report of observation to Architect for review.

1.8 CODES AND REGULATIONS

- A. All work pertaining to and all materials supplied for executing and completing this Contract shall comply with provisions specified in the Contract Documents and with all applicable laws, regulations and ordinances governing Work including, but not necessarily limited to, those of:
 1. California Code of Regulations (CCR), Title 24, California Building Standards Code:
 - a. CAC - 2022 California Administrative Code, 24 CCR Part 1
 - b. CBC - 2022 California Building Code, 24 CCR Part 2, Volumes 1 and 2 (Ü15 IBC w/CA Amendments)
 - c. CEC – 2022 California Electrical Code, 24 CCR Part 3 ('11 NEC w/CA Amendments)
 - d. CMC – 2022 California Mechanical Code, 24 CCR Part 4 ('12 UMCw/CA Amendments)
 - e. CPC - 2022 California Plumbing Code, 24 CCR Part 5 ('12 UPC w/CA Amendments)
 - f. 2022 California Energy Code, 24 CCR Part 6
 - g. CFC – 2022 California Fire Code, 24 CCR Part 9 ('12 IFC w/ca Amendments)
 - h. CALGreen - 2022 California Green Building Standards Code, 24 CCR Part 11
 - i. CRSC - 2022 California Reference Standards Code, 24 CCR Part 12
 2. California Code of Regulations (CCR), Title 19, Public Safety, Division 1, State Fire Marshal.
 3. Addenda Compliance per CBC Section 4-338(b), Part 1.
- B. Administrative Regulations, CCR Title 24, Part 1, California Administrative Code, Chapters 1, 4,

5:

1. DSA not subject to Arbitration.
2. Copy of Part 1 and Part 2, Volume 1 and 2 (CBC), and Parts 3 through 5 of Title 24 CCR, shall be kept and made available at the construction site office during construction.

C. ADA - Americans with Disabilities Act of 1990, as amended

1. Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.

D. Enforcement includes all other codes, regulations, or standards referenced in the above listed codes.

E. The preceding listed codes, regulations and ordinances of the regulatory agencies are hereby made a part of this Contract. Nothing in the Contract shall be construed as allowing any violation of any provision of any of above listed documents. Maintain copies of Codes listed above at the construction site.

F. Threaded Steel Anchor Bolts and Anchor Rods requirements: DSA Interpretation of Regulation IR 17-11 requirements for identification, sampling and testing of threaded steel anchor bolts and anchor rods used for anchor structural elements to foundations.

1. Anchor bolt and anchor rod materials identifications, sampling and testing shall be performed in accordance with IR 17-11 and the applicable standards. Anchor bolts and anchor rods not readily identifiable by physical markings, nor traceable by documentation accompanying the material's shipment, shall be treated according:
 - a. Sampled and tested to established conformity to the project documents.
 - b. Remove from the jobsite and replaced with identifiable material.
2. Copy of IR 17-11 may be obtained at:
www.dgs.ca.gov/dsa/Resources/IRManual.aspx

1.9 VARIATIONS WITH LAWS

A. If Contractor, his subcontractors or suppliers, or any of their employees ascertain at any time that requirements of this Contract conflict with or are in violation of applicable laws, codes, regulations and ordinances he shall not proceed with Work in question, except at his own risk. Contractor shall be required to remove that Work from site and replace such Work with all complying Work at no additional cost to Owner.

1.10 SELECTION AND PAYMENT – TESTING LABORATORY AND SPECIAL INSPECTORS

- A. Owner will employ and pay for services of independent Testing Laboratory and Special Inspectors approved by Architect and DSA to perform inspection and testing in accordance with Part 1, Title 24, Section 4-335, California Code of Regulations, and this Section.
- B. Offsite fabrication requiring Inspection and Testing: submit the qualifications of Inspectors and laboratory, including proposals for services, to the Owner and Architect for approval of

qualifications and costs. Inspectors and laboratories shall conform to the requirements of Part 1 Title 24 Section 4-335.

- C. Inspector of Record (IOR) / Testing Laboratory Travel Expenses
 - 1. Initial Testing. For initial testing required by this Manual, Owner shall pay IOR, Testing Laboratory or both, for travel expenses, including mileage, room and board, when travel for inspection and testing of products purchased by the Contractor exceeds 50 miles or 2 hours from the project site.
 - 2. Additional Testing. When initial testing fails, IOR and Testing Laboratory travel expenses, as described above, attributable to required retesting shall be borne by the Contractor and will be deducted by Change Order from funds due and payable, or that become due and payable to Contractor.
 - 3. IOR, Testing Laboratory or both, as applicable, shall forward billings and records of such expenses to the Owner.
- D. When tests and inspections are required on an overtime basis, initial payment will be made by Owner. At termination of Work or completion of Project, all costs for overtime testing and inspections will be deducted from Contractor's final payment (or any funds due and payable) by Change Order.
- E. Before the Testing Laboratory files testing and inspection billings with Owner, they shall be billed indicating segregated straight time from overtime costs. All overtime costs shall be substantiated with detailed explanation for necessity of such work costs.
- F. When materials tested fail to meet requirements herein specified, they shall be promptly corrected or removed and replaced, re-inspected and detested in a manner required by the Architect. Costs involved in re-inspection and retesting will be paid by the Owner and deducted from Contractor's final payment (or any funds due and payable) by Change Order.
- G. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.11 LABORATORY RESPONSIBILITIES

- A. Laboratory shall be licensed to conduct testing and inspection operations in California and shall be approved by DSA. It shall be supervised by a State Licensed Civil Engineer who shall certify and sign all reports.
- B. Provide qualified personnel at site. Cooperate with Architect, Project Inspector and Contractor in performance of services.
- C. Perform specified inspection, sampling and testing of products in accordance with standards specified herein.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Architect, Project Inspector and Contractor by letter of observed irregularities or non-conformance of Work or products.
- F. Perform additional inspections and test required by Architect or governing agencies.

- G. Immediately upon Testing Laboratory determination of a test failure, the laboratory shall telephone the results of test to Architect. On the same day, laboratory shall send written test results to those named on the distribution list below.

1.12 LABORATORY REPORTS

- A. After each inspection and test, promptly submit one copy of laboratory report to the following:
1. Owner
 2. Contractor
 3. Inspector of Record (IOR)
 4. Special Inspectors: Special Inspector's Verified Reports as required by Section 4-336 and shall be submitted in a timely manner.
 5. Architect
 6. Structural Engineer
 7. Mechanical and Electrical Engineers (Related Tests and Inspections).
 8. Division of the State Architect (DSA)
- B. Include:
1. Date issued.
 2. Project title, Architect's number, DSA Application and File number.
 3. Name of inspector.
 4. Date and time of sampling and Specifications Section.
 5. Identification of product and Specifications Section.
 6. Location in the Project.
 7. Type of inspection or tests.
 8. Date of test and ambient conditions at time of test.
 9. Results of tests.
 10. Conformance with Contract Documents.
 11. Signature by Registered Professional Engineer licensed in California.
 12. Statement that tests were conducted in accordance with Parts 1 and 2, Title 24, California Code of Regulations.

- C. Test reports shall include tests made, whether such tests indicate that the material performed satisfactorily or not. Samples taken but not tested shall be reported. Reports shall show that the materials were sampled and tested in accordance with the requirements of the approved Specifications. Reports shall show the specified design strength and shall state whether or not the materials tested comply with requirements. Report special sampling operations where required.
- D. Submit a report verifying that tests and inspections herein specified and otherwise required have been completed and material and workmanship complies with the Contract Documents. Such verification reports shall be submitted at the completion of the Project and at any time the Project is suspended. Parties to receive such reports are the same as listed above.
- E. When requested by Architect, provide interpretation of test results.

1.13 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.
- E. Laboratory shall not interpret code in relation to the design of the building.

1.14 CONTRACTOR RESPONSIBILITIES

- A. Administration of construction by Contractor per CAC Sections 4-330 and 4-343.
- B. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing. Selection of materials required to be tested shall be by the Lab or Owner's Representative and not by the Contractor.
- C. Cooperate with laboratory personnel, Owner's Representative, Project Inspector and the Architect, and provide access to the Work including weekends and after work hours and to manufacturer's facilities.
- D. Provide incidental labor materials and facilities to provide at all times, safe access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- E. Notify Architect, Project Inspector and laboratory 24 hours prior to expected time for operations requiring inspection and testing services. Contractor shall pay for costs incurred if testing or inspections are cancelled and are required to be rescheduled due to the Contractor's failure to notify the Project Inspector in advance as required.
Also, notify Owner in advance of manufacturer of materials to allow testing at source of supply.
- F. In accordance with CBC-17A, Section 1706A, Contractor shall execute and submit a Statement of Responsibility regarding special inspections and testing required for principal wind- and seismic-load bearing systems to the Inspector of Record and the Owner.
- G. The Owner, Project Inspector, or the Architect shall have the right to reject materials and workmanship that are defective or to require their correction. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without cost

to the Owner. I

If the Contractor fails to correct such rejected Work within a reasonable time, fixed by written notice, the Owner will correct same and charge the expense to the Contractor by Change Order.

- H. Should it be considered necessary or advisable by the Owner at any time before date of completion of the entire Work to make an examination of Work already completed by removing or tearing out the same, the Contractor shall on request promptly furnish all necessary facilities, labor and materials. If such Work is found to be defective in any respect due to fault of the Contractor or his subcontractor, all extra expenses shall be charged to the Contractor by Change Order. If, however such Work is found to meet the requirements of the Contract Documents, the additional cost of labor and materials involved in the examination and for replacement costs shall be allowed to the Contractor by Change Order.
- i. When changes of construction schedule are necessary during construction, coordinate such changes with the Testing Laboratory as required.
- J. When the Testing Laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, extra charges for testing attributable to the delay shall be charged to the Contractor by Change Order.
- K. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.
- L. Selection of materials to be tested shall be made by the Testing Laboratory or the Project Inspector and not by the Contractor.
- M. Any material shipped by the contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required, shall not be incorporated in the Work.

1.15 SCHEDULE OF STRUCTURAL TESTS AND INSPECTIONS

- A. Prepare a schedule of tests, inspections, and similar quality control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's Construction Schedule. Update as the Work progresses:
 - a. Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.16 MOISTURE AND ALKALINITY, AND RELATIVE HUMIDITY TESTING

- A.  Conduct Field Testing of concrete slabs, moisture testing per ASTM F1869 -2009. The test area should be at the same temperature and humidity expected during normal use, minimum testing conditions shall be 75+ 10 degrees F. and 50+ 10% relative humidity. Maintain these conditions 48 hours prior to, and during testing.
- B. Field Testing of concrete slabs, relative humidity per ASTM F2170.
- C. Field Testing of concrete slabs, resilient flooring per ASTM F710.
- D. Alkalinity testing: per ASTM F710, ranges shall not exceed those recommended by the flooring

manufacturer.

1.17 EXPANSION BOLTS OR EPOXY-TYPE ANCHORS - APPROVED ANCHORS

- A. Basis of Design Capacities: Design capacities for expansion type and epoxy (adhesive) type anchors should reflect the tested capacity of the anchors including the degree of scatter in the recorded peak loads and the load-displacement response, the type and mechanical properties of the concrete or masonry in which the anchor is installed, anchor edge distance and spacing, and whether the anchors are installed through metal decking into concrete fill. In addition, the potential for concrete cracking in the vicinity of the anchor during its service life and the effect of such cracking on the capacity of the anchor to resist loads shall be considered. The effects of temperature variations on epoxy (adhesive) type anchors shall also be taken into account where applicable. The age, composition and mechanical properties of the materials in which the anchor will be installed shall be evaluated.
- B. The relevant mechanical properties include unit weight, compressive strength, and aggregate size and type. Evaluation of compressive strength on the basis of cores taken at or near the anchor locations shall be permitted. The compressive strength of the material in which the anchor will be installed shall meet or exceed the compressive strength of the material in which the anchor was tested.
- C. Expansion-type anchors: Concrete
 - 1. Kwik Bolt (KB-TZ2) Concrete Wedge Anchor, 3/8 to 3/4 inch diameter. ICC ESR-4266 by Hilti Inc., Tula, OK
 - 2. Simpson Strong-Bolt 2 concrete Wedge Anchor, 1/2, 5/8, 3/4 and 1 inch diameter, ICC ESR-3037, by Simpson Strong-Tie, Pleasanton, CA ,
 - 3. Or equal with ICC Report Number.
- D. Expansion-type anchors: Concrete filled CMU Masonry
 - 1. Kwik Bolt 3 Masonry Anchors, 1/4 to 3/4 inch diameter, ICC ESR-2302, by Hilti.
 - 2. Wedge-All grout-filled CMU anchor, 3/8, 1/2, 5/8, and 3/4 inch diameter, ICC ESR-1396, by Simpson Strong-Tie.
 - 3. Or equal with ICC Report Number.
- E. Epoxy-Type Adhesive Anchors:
 - 1. For fully grouted CMU, lightweight concrete construction
 - a. HIT HY-70 by Hilti, ICC ER-2682.
 - b. Or equal with ICC Report Number.
 - 2. For Normal Weight concrete with min. compressive of 2500 psi or 4000 psi.
 - a. HIT RE 500-SD Adhesive Anchor System by Hilti, ICC ESR-2322.
 - b. SET-XP adhesive by Simpson Strong-Tie, ICC ESR-2508
 - c. Or equal with ICC Repo% Number.

- F. Expansion-type anchors. Expansive type anchors may be used, provided the allowable shear and tension loads are determined by test in accordance with following:
1. The allowable values listed in an ICC-ES Evaluation Service Report, with special inspection, may be used for allowable stress design, provided the report states that the anchors were tested in accordance with AC 01, latest revision, including the seismic qualification tests of AC 01 Section 5.6. Strength design values may be used provided the anchors have been tested in accordance with AC193, latest revision, including the seismic qualification tests of ACI 355.2 Sections 9.6 and 9.7 and Annex 1 of AC-193.
 2. For anchors installed in the underside of a beam/slab, the allowable tension load design values should be based on the tabulated value of the anchors installed without special inspection (special inspection is still required), unless allowable load values for anchors installed in cracked concrete are provided in the ICC-ES Report, or the anchors have been tested in accordance with ACI 355.2, latest revision, Table 5.2 and Annex 1 of AC-193, or ACI-318-11 Appendix D. Shear values are based on the tabulated values in the ICC-ES Report. Once an ICC-ES Report complying with AC-193 has been issued, it shall take precedence over any previous report.
 3. If anchors have not been tested in accordance with the requirements for seismic qualification tests of AC 01, Section 5.6, the allowable load values listed in the ICC-ES Report may be used with the following modifications:
 - a. Allowable shear and tension loads shall be limited to 80% of the tabulated allowable values for anchors installed with special inspection.
 - b. For anchors installed in the underside of a beam/slab, the allowable tension load should be based on 80% of the tabulated allowable value for anchors installed without special inspection (special inspection is still required). Allowable shear values should be based on "a." above.
 4. Underside of Beam/Slab Installations: except as noted in Section, all expansion type anchors installed in the underside of a beam/slab should use the reduced allowable design load values determined in F.1 and F3.b above.
 - a. The allowable design loads in F.1, F3.a above may be used for expansion-type anchors installed in the underside of a beam/slab, provided the installation meets one of the following criteria:
 - b. The design engineer provides information that indicates the anchor installation will occur in the negative moment (-M) region of the beam/slab, considering unbalanced loading, or
 - c. Data is submitted to indicate that specific anchor is suitable for use in cracked concrete (testing per ACI 355.2, Table 5.2, including Annex 1 of ACI 193), or
 - d. The anchor is installed in the high flute (rib) of the metal deck in a concrete on metal deck assembly, or
 - e. The anchor is installed with sufficient embedment that the load transfer zone is above the neutral axis of the beam/slab.
 - f. When installing expansion-type anchors through the low flutes of metal deck into concrete, the anchors should be placed as close to the center of the flute width as practicable. The deck shall be 20-gage minimum thickness per CBC Section 2210A.1.1.2 and the flute width shall meet or exceed the value set forth in the ICC-ES Report for the anchor. The minimum elective depth of

embedment shall be as noted in the ICC-ES Report for the anchor.

- G. Epoxy-type anchors. Epoxy-type (adhesive) anchors include anchors that rely on organic and inorganic compounds (including) epoxies, polyurethanes, methacrylate's and vinyl esters) to develop the bond to the concrete.
1. The use of shallow epoxy-type (adhesive) anchors to resist direct tension loads where concrete cracking may occur is not permitted. Shallow epoxy-type (adhesive) anchors are those with an embedment to diameter ratio less than 8.
 2. Epoxy-type (adhesive) anchors should only be installed in conditioned, interior spaces. Where epoxy type anchors are used as shear dowels at the perimeter of an existing opening (slab or wall) to be filled with concrete, or are being used to connect new concrete elements to existing concrete elements (e.g. gunite), they may be installed in exterior locations with prior approval by DSA.
 3. If epoxy-type (adhesive) anchors are exposed to fire, all anchors in the affected area shall be inspected and evaluated by a qualified person to ensure their load carrying capability has not been compromised.
 4. The design shear and tension capacities of epoxy-type anchors must be determined in accordance with the following:
 - a. The allowable loads may be based on the values listed in an ICC ES Report that complies with requirements of AC 58 for a specific anchor in the same configuration as tested. Supporting data shall include the Seismic Qualification test performed in accordance with procedures of Section 5.3.7 of AC 58.
 - b. Where epoxy-type (adhesive) anchors are used for structural applications, such as dowels between new and existing concrete the anchors shall be installed in a manner such as that the ultimate tensile capacity is controlled by the ultimate strength of the steel element.
- H. When epoxy-type (adhesive) anchors are used to resist tensile forces in structural applications, the minimum depth of embedment shall be greater than or equal to the development length, l_d , determined in ACI 318-11 for a cast-in-place reinforcing bar of the same diameter and grade when considering a tensile splitting failure mode. Where tensile splitting need not be considered, the depth of embedment, may be determined in accordance with Appendix D of ACI 318-11 as amended by Section 3.3 of AC 308.
- I. Embedment, Spacing, and Edge Distance: All anchors shall meet the minimum embedment, spacing, edge distance, and slab thickness criteria established by the relevant ICC-ES Report.
1. Unless otherwise noted in the Report, the edge distance should be a minimum of ten (10) bolt diameters from the free edge of the slab and center-to-center spacing should be a minimum of twelve (12) bolt diameters.
- J. Holes shall be clean and free from dust immediately prior to installation of the anchor.

1.18 TESTING AND INSPECTION REQUIREMENTS FOR EXPANSION AND EPOXY ANCHORS

- A. Post-installed anchors shall be tested in accordance with the provisions of CBC Section 1913A.7 by an accepted testing facility or Special Inspector. If any anchor fails testing, test all anchors of the

same type, not previously tested until twenty (20) consecutive anchors pass, then resume the initial test frequency. If the anchors are used for the support and bracing of non-structural components (pipe, duct or conduit), the twenty (20) shall be only those anchors installed by the same trade. Refer to 1.19G.8 on the Test Values Table (this Section) for acceptance/failure criteria.

- B. Structural Applications: Tension test all expansion-type anchors. Expansion-type anchors shall not be used as hold-down bolts. When used for sill plate bolting application 10% of the anchors shall be tension tested.
- C. Non-Structural Applications: Tension test 50% or alternate bolts including at least one-half the anchors in each group, shall be tension tested. in a group. Nonstructural may include such applications as equipment anchorage.
- D. Tension testing shall be done in the presence of the project inspector and a report of the test results shall be submitted to DSA. If any anchors fail the tension-testing requirements, the additional testing requirements shall be acceptable to DSA.. The requirements shall also apply to bolts or anchors set in concrete with chemical (adhesives) if the long-term curability and stability of the chemical material and its resistance to loss of strength and chemical change at elevated temperatures are established to the satisfaction of the DSA.
- E. Expansion Type Anchors Setting Verification:
 - 1. Torque-Controlled Anchors: Following attainment of 10% of the required torque, torque-controlled anchors shall not require more than six (6) additional complete turns of the nut during installation to achieve the manufacturer's specified installation torque. The extent of bolt projection after installation shall be measured to confirm that this requirement has been meet.
 - 2. Displacement-Controlled Anchors: The position of the plug in the anchor shell shall be checked with the manufacturer-supplied installation tool or other appropriate device. The position of the plug shall conform to the manufacturer's specifications.
- F. Testing for Expansion-Type Anchors: The test load may be applied by any method that will effectively measure the tension in the anchor, such as direct pull with a hydraulic jack, calibrated spring loaded devices, or a calibrated torque wrench. Displacement-Controlled anchors such as drop-in shall not be tested using a torque wrench. Required test loads may be determined by either of the following methods:
 - 1. Twice the allowance tension load as determined in Article 1.18.,or;
 - 2. Tension or torque test values from the table and proceduresbelow.
 - 3. Anchors tested with a hydraulic jack should exhibit no discernable movement during the tension test, e.g., as evidenced by loosening of the washer under the nut. Anchors tested with a calibrated torque wrench must attain the specified torque within 1/2 turn of the nut.
- G. Test Values: Conform to the following table for either Hardrock or Lightweight Concrete and Masonry:
 - 1. All anchor bolts of the expansion type installed in concrete shall be one of the following or equal:

- a. ITW Red Head-Wedge Anchor-ICC/ES ESR-2427
- b. Hilti, Inc. - Qwik Bolt TZ - Wedge Anchor-ICC/ES ESR-4266
- c. Simpson - Strong Bolt - Wedge Bolt - Wedge Anchor-ICC/ES ESR-3037

Minimum Test Values - Normal Weight or Lightweight Concrete

ANCHOR		WEDGE	
Dia(in)	Tension Load(lbs)	Torque(ft-lbs)	Embedment(in)
3/8	1105	25	2
1/2	2420	40	3-1/4
5/8	4015	60	4
3/4	4690	110	4-3/4

2. All anchor bolts of expansion type installed in grout filled masonry shall be one of the following or equal:

- a. Hilti, Inc - Kwik Bolt III-Wedge Anchor-ICC/ES NO.1385
- b. Simpson-Wedge All-Wedge Anchor-ICC/ES NO. 1396

Minimum Test Values - Grout Filled Concrete Masonry

ANCHOR		WEDGE	
Dia(in)	Tension <u>Load</u> (lbs)	Torque(ft-lbs)	Embedment(in)
1/4	432	4	2
3/8	626	15	2-1/2
1/2	724	25	3-1/2
5/8	1035	65	4
3/4	1368	120	4-3/8

3. Anchor diameter refers to the thread size for the WEDGE ANCHORS.
4. Reaction loads from test fixtures may be applied close to the anchor being tested, provided the anchor is not restrained from withdrawing by the fixture(s).
5. Test equipment (including torque wrenches) shall be calibrated by an approved testing laboratory in accordance with standard recognized procedures.
6. The following criteria apply for the acceptance of installed anchors:
- a. Hydraulic Ram Method: The anchor shall have no observable movement at the applicable test load. For wedge and sleeve anchors, a practical way to

- determine observable movement is that the washer under the nut becomes loose
- b. Torque Wrench Method: The applicable test torque must be reached within the following limit for wedge type:
 - 1) Wedge or Sleeve type: One-half (1/2) turn of the nut.
 - 2) One-quarter (1/4) turn of the nut for the 3/8 inch sleeve anchor only.
 - 7. Testing shall occur within 24 hours after installation.
 - 8. If the manufacturer's recommendation installation torque is less than the test torque listed in the table above, the manufacturer's installation torque shall be used in lieu of the tabulated values.

1.19 EPOXY-TYPE (ADHESIVE) ANCHORS AND SCREW-TYPE ANCHORS

- A. Epoxy-type (adhesive) anchors shall be tension tested per Section 1913A.7. The tension test load shall equal twice the allowable load for the specific location of the anchor to be tested (i.e., accounting for edge distance) or 80% of the yield strength of the bolt (0.8AbFy), whichever is less. The test procedures for expansion-type anchors in the attached table shall also be used for epoxy-type (adhesive) anchors. Torque testing of epoxy-type (adhesive) anchors is not permitted.
- B. Where epoxy-type (adhesive) anchors are used as shear dowels across cold joints in slabs on grade and the slab is not part of the structural system, testing of those dowels is not required.
- C. Anchors shall exhibit no discernible movement during the tension test.
- D. Screw Anchors: The fastener is produced from hardened steel with threads, similar in appearance to a lag bolt. Screw anchors may be used, provided the allowable shear and tension loads are determined in accordance with the following:
 - 1. The allowable values listed in an ICC ES Report, with special inspection, may be used for allowable stress design, provided the report states that the anchors were tested in accordance with AC 106, latest revisions, including the seismic qualification tests of AC106 Section 4.6.
 - 2. Welding to these anchors is not permitted.
 - 3. Screw anchors may be used to attach components, such as equipment, mechanical vibration isolators or snubbers, to structural (reinforced) concrete, or for sill bolting applications. All screw anchors installed through a wood sill plate requires a plate washer in conformance with Section 2308.6.
 - 4. The use of screw anchors is not permitted in overhead applications or for discrete hold down forces, such as shear walls.
 - 5. Masonry Anchors: 1/4" diameter, Tapcon with Advance Threadform Technology, heat-treated steel, by Illinois Tool Works/Buildex, ICC-ESR-1671. Slotted Hex Washer Head.
- E. Screw-type anchors shall be torque tested in accordance with the testing procedures in Test Values Table and procedures herein.

- F. Screw-type anchors: Simpson Strong-Tie Titen-HD concrete anchor, 3/8, 1/2 and 3/4 inch diameter, ICC ESR-2713, by Simpson Strong-Tie, Pleasanton, CA or equal with ICC report number.
- G. Screw-type anchors: Simpson Strong-Tie Titen-HD grout-filled CMU anchor, 3/8, 1/2, 5/8, and 3/4 inch diameter, ICC ESR-1056, by Simpson Strong-Tie, Pleasanton, CA or equal with ICC report number.

1.20 POWDER ACTUATED FASTENERS

- A. Powder-Actuated Fasteners: Powder-actuated fasteners (shot pins) are not addressed by Chapter 1908A1.1 of CBC. Powder-actuated fasteners may be used for limited application provided the allowable shear and tension loads are determined in accordance with the following:
 - 1. The allowable values listed in an ICC ES Evaluation Services Report, with special inspection, may be used for allowable stress design, provided the report states that the anchors were tested in accordance with AC 70, latest revision. Powder-actuated fasteners may be used for hanging metal suspension systems for lay-in panel ceilings and for the attachment of metal track in conjunction with non-bearing partitions. The use of powder-actuated fasteners for other applications shall be subject to review and approval of DSA.
- B. Powder actuated fasteners (Shot Pins): Installer shall utilize tools recommended by the manufacture in compliance with the ICC code reports. Pins shall have a minimum diameter of 0.145 inch and be installed to conform to the load requirements of this Section and:
 - 1. Tables 1 (driven into steel), 2 (driven into concrete), and 4 (driven into Structural lightweight concrete) of ICC ESR-1663, Hilti or
 - 2. Table 1 or 3 (driven into concrete), 2 (driven into steel), 5 (driven into structural lightweight concrete), and 6 (driven in hollow concrete masonry units) of ICC ESR-2138, Simpson Strong-Tie powder-actuated fasteners or
 - 3. Table 1 and 2 (driven into concrete), 3 (driven into structural lightweight concrete), 4 (driven into hollow concrete masonry units), 5 (driven into steel) of ICC ESR-2811, Simpson Strong-Tie gas-actuated fasteners or equal with ICC report.
- C. Allowable Loads: Limited to 100 lbs. maximum or 80% of ICC approved values whichever is less. Testing required.
- D. 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:
 - 1. Normal-Weight Concrete: Ceiling Clip Assembly Hilti X-CW, minimum 0.138" diameter, minimum penetration 1-1/8". Allowable Loads: 210 lbs. tension listed in ICC Report: ICC ESR 2184: 4000 psi Concrete Compressive Strength.
 - a. Type X-CW X-C 32 KWIK, by Hilti, Inc., Tulsa, OK, or equal.
 - 2. Lightweight Concrete: Ceiling Clip Assembly, minimum 0.138" diameter, minimum penetration 1-1/8". Required Allowable Loads: 150 lbs tension values listed in ICC ESR 2184: 3000 psi Concrete Compressive Strength.

- a. Type X-CW C-C 32, by Hilti, Inc., Tulsa, OK, or equal.
- 3. Use manufacture's drill bits and recommended tools.
- E. Permissible Loads for Sills. Light gage steel and Interior Wood Plate Anchorages:
 - 1. Low Velocity Power-Driven Fasteners: normal-weight concrete: Hilti DS and X-CR (stainless steel for exterior applications), 0.177, 0.145 for X-CR, shank diameter with washers, ICC-ESR Report ER-1663, Table 2. Exterior or Perimeter Sill and Interior Plate Anchorages.
 - 2. Low Velocity Power-Driven Fasteners: normal-weight concrete: Simpson PDPWL-300, 3 inches long, 0.300 inch head diameter and 0.145 inch shank diameter with washer, ICC ESR-2138, Table 1 or 4. Exterior or Perimeter Sill and Interior Plate Anchorages.

1.21 REQUIRED TESTING FOR POWDER ACTUATED FASTENERS

- A. Testing: Operator, tool and fastener shall be pre-qualified by the Project Inspector.
 - 1. Tools shall conform to ANSI A10.3 safety requirements for Powder Actuated Fastening Systems and to all OSHA requirements.
 - 2. Manufacturer's representative shall provide safety training for all installation personnel and provide powder actuated tool operator certification in accordance with OSHA requirements.
- B. The Project Inspector shall observe the testing of the first 10 fastener installations.
- C. A test pullout load of not less than twice the design load or 200 lbs., whichever is greater, shall be applied to the fastener in such a manner as not to resist the spalling tendency of concrete in which the fastener is imbedded. Thereafter, random tests under the Project Inspector's supervision shall be made of approximately 1 in 10 fasteners.
- D. Should failure occur on any fastener tested, all installations shall be tested until twenty consecutive fasteners pass, then resume the initial testing frequency.

1.22 INSTALLATION

- A. When installing drilled-in anchors or powder driven pins in reinforced concrete, use care and caution to avoid cutting or damaging reinforcing bars. When required by the Architect, locate the reinforcing by using a non-destructive method prior to installation. Exercise extreme care and caution to avoid cutting or damaging reinforcing during installation. Maintain a minimum clearance of one inch between the reinforcing and the anchor and/or pin.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 TESTS

- A. The Owner will select an independent testing laboratory to conduct the tests. Selection of the material required to be tested shall be by the laboratory or the Owner's representative, per Title 24, Part 2 (2022 CBC) – Volume 2, and not by the Contractor.
- B. The contractor shall notify the Owner's representative a sufficient time in advance of the manufacture of material to be supplied by contractor under the Contract Documents, which must by terms of the contract be tested, in order that the Owner may arrange for the testing of same at the source of supply.
- C. Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required shall not be incorporated in the Job.
- D. The Owner 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 documents.

3.2 TEST REPORTS

- A. One copy of all test reports shall be forwarded to the Division of the State Architect by the testing agency. Such reports shall include all tests made, regardless of whether such test indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations as required shall also be reported. The reports shall show that the material or materials were sampled and tested in accordance with the requirements of Title 24 and with the approved specifications. Test reports shall show the specified design strength. They shall also state definitely whether or not the material or materials tested comply with requirements.

3.3 VERIFICATION OF TEST REPORTS

- A. Each testing agency shall submit to the Division of the State Architect a verified report in duplicate covering all the tests which are required to be made by that agency during the progress of the project. 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, covering all tests.

3.4 INSPECTION BY THE OWNER

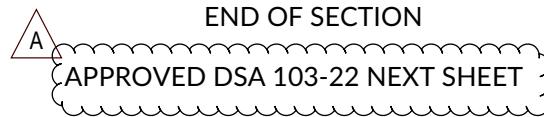
- A. The Owner and Owner's representatives shall at all times have access for the purpose of inspection to all parts of the work and to the shops wherein the work is in preparation, and the Contractor shall at all times maintain proper facilities and provide safe access for such inspection.
- B. The Owner shall have the right to reject materials and workmanship, which are defective, or to require their correction. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without charge to the Owner. If the Contractor does not correct such rejected work within a reasonable time, fixed by written notice, the Owner may correct same and charge the expense to the Contractor.
- C. Should it be considered necessary or advisable by the Owner at any time before final acceptance of the entire work to make an examination of the work already completed by removing or tearing out the same, the Contractor shall on request promptly furnish all necessary facilities, labor and materials. If such work is found to be defective in any respect due to the fault of the Contractor or his subcontractor, he shall defray all expenses of such examinations and of satisfactory reconstruction. 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.

3.5 INSPECTOR – OWNERS

- A. A DSA certified Project Inspector and Special Inspector shall be employed by the Owner in accordance with the requirements of the California Code of Regulations, Title 24, Part 1, will be assigned to the work. Inspector's duties are specifically defined in Section 4-342 of Title 24, Part 1.
- B. The work of construction in all stages of progress shall be subjected to the personal continuous observation of the Inspector. Inspector shall have free access to any or all parts of the work at any time. 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. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.

3.6 INSPECTOR – OWNER – FIELD OFFICE

- A. The Contractor shall provide for the use of the Owner's Inspector a temporary office to be located as directed by the Inspector and to be maintained until removal is authorized by the Owner. This office shall be of substantial waterproof construction with adequate natural light and ventilation by means of stock design windows. The door shall have a lock. A table satisfactory for the study of plans and two chairs shall be provided by the Contractor. The Contractor shall provide and pay for adequate electric lights, private local telephone service with a loud exterior bell, and adequate heat for this office until the completion of the Contract.



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

General

Application Number:

03-123832

DSA File Number:

School Name:

Walnut High School

Increment Number:

School District:

Walnut Valley Unified School District

Date Created:

2024-04-30 10:49:25

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

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

KEY TO COLUMNS

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

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

S1. GENERAL:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
☒	a. Verify that: • Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations. • Foundation excavations are extended to proper depth and have reached proper material. • Materials below footings must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

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

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

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

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

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

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

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

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

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

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

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

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

C6. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	a.			

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

1705A.4; TMS 602-16, Tables 3 and 4.

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

M1. STRUCTURAL MASONRY: (f'_m =				
	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	a. Mill certificate indicates compliance with requirements for reinforcement, anchors, ties, fasteners and metal accessories. See item C1(b) for identification, sampling and testing of reinforcing steel.	Periodic	SI*	2103A.4; TMS 602-16 Article 1.5B.2 & 2.4. * To be performed by qualified LOR representative. Applicable testing by LOR. See IR 17-10 for unidentified reinforcing steel.
☐	b. Producer's certificate of compliance for masonry units, mortar and grout materials.	Test	LOR	1705A.4, 2103A.2, 2103A.3, 2103A.5; TMS 602-16 Articles 1.5B.2 2.1, 2.2, 2.6A and 2.6B, and Table 6 footnote 3.
☐	c. Test masonry (f'_m).	Test	LOR	1705A.4. For Unit Strength: 2105A.3; TMS 602-16 Articles 1.4B.2, 1.5B.1 & 1.5B.2. For Prism (required when $f'_m > 2000$ psi): 2105A.2; TMS 602-16 Articles 1.4B.3, 1.4B.4, 1.5B.1 & 1.5B.2.
☐	d. Verify proportions or properties of site-prepared, premixed or preblended mortar.	Periodic	SI	TMS 602-16, Table 3 (row 5), Table 4 Item 1a. DSA PR 20-01. (See Appendix (end of this form) for exemptions.)
☐	e. Verify proportions or properties of site-prepared, premixed or preblended grout.	Periodic	SI	TMS 602-16, Table 3 (row 5), Table 4 Item 2d. (See Appendix (end of this form) for exemptions.)
☐	f. Batch plant inspection:	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. Refer to TMS 602-16 Table 3 and Table 4, Item #3a. (See Appendix (end of this form) for exemptions.)
☐	g. Test core-drilled samples.	Test	LOR	2105A.4. (See Appendix (end of this form) for exemptions.)
☐	h. Inspect preparation of prisms.	Continuous	SI	TMS 602-16 Articles 1.4.B.3 & 1.4.B.4 & Table 4 Item 4.
☐	i. Verify size, location and condition of all dowels, construction supporting masonry, etc.	Periodic	SI	

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

1705A.4; TMS 602-16, Tables 3 and 4.

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	j. Verify size, grade and type of reinforcement, connectors, and anchor bolts. Verify size and location of structural members.	Periodic	SI	TMS 602-16 Table 4, Items 1c & 3c.
☐	k. Inspect placement of reinforcement, anchor bolts, and connectors.	Continuous	SI	TMS 602-16 Table 4 Item 2c.
☐	l. Placement, consolidation, and reconsolidation of grout.	Continuous	SI	TMS 602-16 Table 4 Item 3h.
☐	m. Inspect placement of masonry units and construction of mortar joints.	Periodic	SI	TMS 602-16 Table 4 Item 3b.
☐	n. Verify preparation, construction and protection of masonry during cold weather (temperature below 40° F) or hot weather (temperature above 90° F).	Periodic	SI*	TMS 602-16 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA.
☐	o. Inspect type, size and location of anchors and all other items to be embedded in masonry including other details of anchorage of masonry to structural members, frames and other construction.	Continuous	SI	TMS 602-16 Table 4 Item 3d.
☐	p. Inspect grout space, including mortar protrusions, prior to placement of grout.	Continuous	SI	TMS 602-16 Table 4 Item 2a.
☐	q. Welding of reinforcing steel.	TMS 602-16 Table 4 Item 3e. Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

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

1705A.4; TMS 602-16, Tables 3 and 4.

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

M2. VENEER OR GLASS BLOCK PARTITIONS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	a. Verify proportions of site prepared mortar and grout and/or verify certification of premixed mortar.	Periodic	SI	TMS 602-16 Table 3 (row 5) and Table 4 Items 1a & 2d.
☐	b. Inspect placement of units and construction of mortar joints.	Periodic	SI	TMS 602-16 Table 4 Item 3b.
☐	c. Inspect placement of wire, connectors and anchors	Periodic	SI	TMS 602-16 Table 4 Item 2c.
☐	d. Inspect type, size and location of anchors and all other items to be embedded in masonry veneer including details of anchorage of masonry to veneer backing, frames and other construction.	Periodic	SI	TMS 602-16 Table 4 Item 3d.
☐	e. Verify preparation, construction and protection of masonry during cold weather (temperature below 40° F) or hot weather (above 90° F).	Periodic	SI*	TMS 602-16 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA.
☐	f. Test adhered veneer bond strength.	Test	LOR	1410.2.1; TMS 402 Article 12.3.2.4. (Field constructed mock-up laboratory tested in accordance with ASTM C482).

M3. POST-INSTALLED ANCHORS IN MASONRY:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
☒	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, 1705A.4, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic); ACI 318-14 Sections 17.8 & 26.13. * May be performed by the project inspector when specifically approved by DSA. (See Appendix (end of this form) for exemptions.)

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

1705A.4; TMS 602-16, Tables 3 and 4.

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

	Test or Special Inspection	Type	Performed By	Code References and Notes
☒	b. Test post-installed anchors.	Test	LOR	1705A.4, 1910A.5. (See Appendix (end of this form) for exemptions.)

	M4. OTHER MASONRY:			
	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	a.			

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

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

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

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

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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



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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

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

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

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

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



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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

	S/A11. Other Steel			
	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	a.			



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

Application Number:

03-123832

DSA File Number:

School Name:

Walnut High School

Increment Number:

School District:

Walnut Valley Unified School District

Date Created:

2024-04-30 10:49:25

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

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

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

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

Application Number:
03-123832
DSA File Number:

School Name:
Walnut High School
Increment Number:

School District:
Walnut Valley Unified School District
Date Created:
2024-04-30 10:49:25

CONCRETE/MASONRY:

- ☐ 5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

WELDING:

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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

WELDING:



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

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

Name of Architect or Engineer in general responsible charge:

Scott Griffith

LICENSE C224897

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

LES TSO / HOHBACH LEWIN STRUCTURAL ENGINEERS

Signature of Architect or Structural Engineer:



Date: 04-30-2024

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

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

APP: 03-123832 INC:

REVIEWED FOR

SS ☒

FLS ☒

ACS ☒

DATE: 05/31/2024

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

Application Number:

03-123832

School Name:

Walnut High School

School District:

Walnut Valley Unified School District

DSA File Number:

Increment Number:

Date Created:

2024-04-30 10:49:25

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

2. Concrete Batch Plant Inspection: Laboratory Verified Report Form DSA 291

3. Post-installed Anchors: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

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

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

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

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

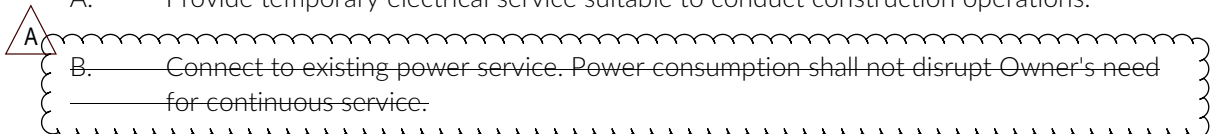
- A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, water and sanitary facilities.
- B. Temporary Controls: Barriers, enclosures, fencing, protection of Work and security.
- C. Construction Facilities: Access roads, parking, progress cleaning, project sign, Architect's banner, and field office trailer.
- D. Special Controls: Waste disposal facilities, Water Control, Dust Control, Erosion and Sediment Control, Noise Control, Pollution Control.
- E. Comply with Title 24, Part 9, California Fire Code, Chapter 33 Fire Safety During Construction and Demolition, during all Phases of project.

1.2 SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, limits of work area boundaries, and parking areas for construction personnel.
- B. Phasing Plan: Submit Phasing Plan to confirm understanding of phasing work required and in coordination with Architect's Phasing Plan indicating horizontal routing of pedestrian traffic, entryways, , barrier plans and signage plan. Include schedule or time of day when Owner's use of facilities will be affected by construction Work.

1.3 TEMPORARY ELECTRICITY

- A. Provide temporary electrical service suitable to conduct construction operations.



- C. Contractor shall pay cost of energy used. Exercise measures to conserve energy.
- D. Provide power outlets for construction operations with branch wiring and distribution boxes located where needed. Provide flexible power cords as required.
- E. Provide feeder switch at source distribution equipment.
- F. Permanent existing convenience receptacles may be utilized during construction.

1.4 TEMPORARY LIGHTING

- A. Provide and maintain adequate lighting for construction operations.

- B. Maintain lighting and provide routine repairs.
- C. Permanent building lighting may be utilized during construction.

1.5 TEMPORARY HEAT

- A. Provide heating devices and heat as required to maintain specified conditions for construction operations.

A

- ~~B. Utilize Owner's existing heat plant if available, extend and supplement with temporary heating devices as required to maintain specified conditions for construction operations.~~

- C. Contractor shall pay cost of energy used. Exercise measures to conserve energy.

1.6 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to assist cure of materials to dissipate humidity and noxious fumes and to prevent accumulation of dust, fumes, vapors or gases.

1.7 TELEPHONE SERVICE

- A. Provide, maintain and pay for two separate telephone service lines and telephone service to field office and Project Inspector's field office at time of project mobilization. Project Inspector's telephone shall be equipped with exterior, clearly audible bell.
- B. Provide and pay for cellular telephone service for Project Inspector's use at time of project mobilization.
- C. Provide answering machine.
- E. Provide, maintain, and pay for copy machine with 11 by 17 inch capability.

1.8 TEMPORARY WATER SERVICE

- A. Provide for suitable quality water service.
- B. Contractor shall pay cost of water used. Exercise measures to conserve water.
- C. Extend branch piping with outlets located so water is available by hose with threaded connections.

1.9 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities ~~and enclosures for existing facilities.~~

A

1.10 TEMPORARY FIRE PROTECTION

- A. Provide fire protection during construction according to CFC Chapter 33, including but not limited to fire extinguisher requirements and exit access requirements.

- B. Conform to Title 24, Part 9, California Fire Code, Chapter 33, , Fire Safety During Construction/Demolition.

1.11 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades required by governing authority for public rights-of-way and for public access to existing facilities.
- C. Provide protection for plant life designated to remain. Replace damaged plant life.
- D. Protect non-owned vehicular traffic, stored materials, site and structures from damage.
- E. Provide steel trench plates, orange mesh fencing, construction site marker and other protective means to keep site and users, Owner's personnel, visitors and students safe, protected, and separated from ongoing construction operations. Provide temporary access at all paths of travel. Yellow warning tape is not acceptable means of separation and protection. At all open trenching operations, enclose entire trenching operation area including stockpiled backfill within orange mesh construction fencing. Provide steel trench plate "bridges" at all walkways.
 - 1. Notify Fire Marshall at least 48-hours prior to beginning utility work in the existing Fire Lane.
 - 2. Allow Fire Marshall access at reasonable times during progress of the work for inspections.

1.12 FENCING FOR CONSTRUCTION OPERATIONS

- A. Construction: Commercial grade chain link fence, , top and bottom knuckled selvage (closed end).
 - 1. Provide screen full height of fence, 1-3/4 inch mesh, 11 gauge, woven open mesh 100% polypropylene with 78 percent wind break, reinforced tape at grommets at 18 inches centers at perimeter, attach screen to chain link fence with 11 gauge hog rings by Roxford Fordell, Los Angeles, CA.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.
- C. Submit detailed fencing and construction traffic plan for review and approval by Architect.
- D. At completion of project repair concrete or A.C. substrate, fill holes to match existing materials flush with adjacent surface.

1.13 STAGING AREAS

- A. Coordinate with Owner for location, extent, and type of construction staging area.
 - 1. Fixed Equipment may be new or used, temporary or permanent, devices including any heat generating or cooling equipment that can be operated in a safe manner and with approval from the authorities having jurisdiction.

1.14 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
- C. Provide protective coverings at walls, projections, jambs, sills and openings. Provide protective and removal coverings for metal finishes intended to be exposed.
- D. Protect finished floors and other surfaces from traffic, dirt, wear, damage or movement of heavy objects by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces.
- F. Prohibit traffic from landscaped areas.
- G. Provide sticky track mats at transition areas to minimize footprints and distribution of dirt from construction areas through occupied corridors, classrooms, and adjacent workspaces. At carpet floors provide "Velcro Brand Carpet" protection in lieu of sticky mats.

1.15 SECURITY

- A. Where security or fire detection systems are disabled for any reason, including where Owner has given approval for such system shutdown, provide fire watch or security guard service as directed by Owner at no additional cost to owner.

1.16 ACCESS ROADS

- A. Provide and maintain access to fire hydrants, free of obstructions. Where required by local fire authority, provide and maintain a 26 foot wide fire apparatus access road.
- B. Provide means of removing mud from vehicle wheels before entering streets.
- C. Designated existing on-site roads may be used for construction traffic.
- D. Where construction traffic occurs when students and staff are on campus, provide "spotter" responsible for leading construction traffic through site areas.
- E. Route construction equipment, trucks, and similar vehicles via existing public streets to and from site as approved by governing authorities.

1.17 PARKING

- A. Arrange for temporary parking areas to accommodate construction personnel.
- B. When site space is not adequate, provide additional off-site parking.

1.18 PROGRESS CLEANING

- A. Refer to Section 01 70 00 Execution Requirements and the requirements of this Section.
- B. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition.
- C. Remove debris and rubbish from closed or remote spaces, prior to enclosing space.
- D. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust. Clean substrate' remove dirt, oil, grease, construction markings, and foreign matter that could adversely affect surface finish appearance or performance.
- E. Remove waste materials, debris and rubbish from site weekly and dispose off-site.
- F. Maintain public street free of mud, dust and debris and as required by jurisdictional authority.

1.19 FIELD OFFICE TRAILER(S)

- A. Provide space for office and project meetings.
- B. Field Office Trailer: Provide field office trailer, weather tight with lighting, electrical outlets, communications capabilities, heating, cooling and ventilating equipment and equipped to adequately conduct meetings for construction operations, minimum size; 160 sq. ft.
 - 1. In SAME Field Office trailer provide plan rack suitable for 30" x 42" drawings, and access to the internet.
 - 2. Provide a SECOND separate Field Office trailer similarly equipped as Contractor's Office trailer and furnish desk, chairs, 2 drawer file cabinet, table, plan rack suitable for 30" x 42" drawings, and have access to the internet. Office should be lockable for use by Project Inspector. Access
- C. Cost of use permits, occupancy permits and related fees, if any required by Governing Authorities for temporary construction facilities, shall be paid by Contractor.
- D. Provide 4' x 8' conference table, 6 conference chairs and 3' x 6' white markerboard at both Field Office trailers.
- E. Install no closer than 45 feet from project buildings in accordance with NFPA 241.
- F. Maintain facility until Substantial Completion of entire project. Remove within 1 week of Substantial Completion.
- G. Provide property insurance and protection.

1.20 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

- A. Remove temporary above grade or buried utilities, equipment, facilities, materials prior to Certified Completion inspection.
- B. Remove temporary underground or overhead installations.
- C. Clean and repair damage caused by installation or use of temporary Work.
- D. Restore permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.21 WATER CONTROL

- A. Do not permit surface, rainwater or subsurface water or other liquids to accumulate in or about premises and vicinity thereof. Should such conditions be encountered or develop, control water or other liquid shall be suitably disposed of by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods as reviewed by Architect and approved by authority having jurisdiction.
- B. Reference Section 01 57 23 for Storm Water Pollution Prevention Plan Requirements.
- C. Dewatering Facilities and drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
- D. Dispose of rainwater in lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
- E. Pools: Provide all necessary measures to remove all ground water and rain water from pool excavation.

1.22 DUST CONTROL

- A. Conduct earthwork operations in a manner to prevent windblown dust and dirt from interfering with progress of Work, Owner's activities and existing occupied structures in areas immediately adjacent s well as adjacent properties.
- B. Periodically water construction areas as required minimizing accumulation of dust and dirt.
- C. Water spray or cover with tarpaulins truck loads 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.

1.23 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.
- F. Reference Section 01 57 23 for Storm Water Pollution Prevention Plan Requirements.

1.24 NOISE CONTROL

- A. Avoid excessive noise where adjacent Owner's functions may be detrimentally affected.
- B. Refer to requirements in Section 01 57 20, Control of Construction Noise.

1.25 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 Site.
- C. Comply with regulatory requirements and anti-pollution ordinances during course of construction and disposal operations.

1.26 WASTE DISPOSAL FACILITIES

- A. Comply with requirements of Authorities having Jurisdiction. Remove loose refuse and dispose off site legally.
- B. Provide waste-collection containers in sizes adequate to handle waste from construction operations.
- C. Provide and maintain trash bins on the Project site. Trash bins shall be serviced on an as needed basis.
- D. Free Fall Maximum; 8 ft. Provide enclosed waste CHUTES for higher fall.
 - 1. Provide disposals sufficiently sized to prevent debris from scattering around areas,
 - 2. Use support systems, intake hoppers, protective liners and durable non-breakable chutes. Max-Access Inc., Houston, TX, Chutes International, White Plains, MD or equal.
 - 3. When using demolition chutes, chute opening must be sealed when not in use. Chute and dumpster shall be sprayed with water to maintain dust control.
 - 4. Do not use Owner's disposal system.

1.27 PROTECTION OF EXISTING FACILITIES AND SITEWORK

- A. Provide site plan of proposed route of construction equipment for approval by Owner.
- B. Use caution to minimize disturbance and damage to existing landscaped areas and sitework.
- C. Protect sidewalks, curbs, entry areas and utilities.
- D. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) and irrigation on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- E. Protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. Repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work,
- F. Repair landscaped areas, irrigation and sidewalks and any other damaged facilities where trucks, erection equipment or other construction equipment was used in removal and replacement of the HVAC units during construction. Repair damaged areas to match existing construction to satisfaction of the Owner, and at no additional cost to the Owner.

1.28 CONTRACTOR CONDUCT AND DRESS CODE

- A. Contractor's and subcontractors' personnel shall observe and abide by Owner requirements concerning appropriate conduct, loud noise (unrelated to construction activities) and dress requirements for a safe and un-disturbing workplace. Conduct work activities in a professional manner at all times.
- B. Dress Code requirements: contractor's personnel shall wear traditional work attire or uniforms without logos, graphics or wording detrimental to work [school] environment: unless logos, graphics or wording are for business identification purposes.
- G. Contractors and subcontractors shall wear orange safety vests along with other required safety attire including hard hats and safety glasses.
- D. Identification badges Issued by the Owner shall be worn at all times, worn on the left side shirt-pocket area, displayed in full view and not concealed.
- E. No radios permitted on the job site.
- F. Owner reserves the right to remove any person(s) not observing conduct and dress requirements specified herein.
- G. Animals: Contractors' and worker's pets or animals of any kind are not permitted on the Campus, including being retained in a vehicle.

- H. All District property is tobacco free, drug free, alcohol free, weapons free and graffiti free. Contractor/Construction Manager shall enforce these rules to his crew, subcontractors and suppliers.

1.29 MOBILIZATION AND DEMOBILIZATION

- A. The work consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. It does not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract. Mobilization will not be considered as work in fulfilling the contract requirements for commencement of work.
- B. Mobilization: Equipment and Material: Mobilization shall include all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the contractor's operations at the site; premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable.
- C. Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.
- D. This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted, or added items of work for which the contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.
- E. Payment; Payment will be made as the work proceeds, after presentation of paid invoices or documentation of direct costs by the contractor showing specific mobilization and demobilization costs and supporting evidence of the charges of suppliers, subcontractors, and others. When the total of such payments is less than the lump sum contract price, the balance remaining will be included in the final contract payment. Payment of the lump sum contract price for mobilization and demobilization will constitute full compensation for completion of the work.
- F. Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated in the project, or the purchase costs of operating supplies.

1.30 DAILY REPORTS

- A. CONTRACTOR shall provide and maintain in the Project site office of CONTRACTOR, a daily sign in sheet for use by all employees of CONTRACTOR and all Subcontractors at whatever tier. At the beginning of each workday, the foreman, project manager, superintendent of CONTRACTOR and/or Subcontractor shall visit the site office of the CONTRACTOR and shall enter onto the daily sign in sheet: all employee names; trade classification; and represented company. The completed sign in sheet shall serve as the basis of and shall be submitted with the daily construction report as set forth in Paragraph 1.34.b.

- B. By the end of each workday, CONTRACTOR shall submit to CMR and IOR a daily construction report denoting the daily manpower counts and a brief description/location of the workday activities. Manpower shall be broken down by trade classification such as foreman, journeyman or apprentice. The report shall also note the date, day of the week, weather conditions, deliveries, equipment on the Project Site whether active and/or idle, visitors, inspections, accidents and unusual events, meetings, stoppages, losses, delays, shortages, strikes, orders and requests of governing agencies, Construction Directive and/or Change Orders received and implemented, services disconnected and/or connected, equipment start up or test and partial use and/or occupancies. CONTRACTOR shall also include on the daily construction report the above information for all Subcontractors at whatever tier.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials for temporary work may be new or used.
1. Use materials that are adequate in capacity for the required use and loads.
 2. Do not use materials that would create unsafe conditions,
 3. Do not violate requirements of authorities having jurisdiction.
 4. Sticky Track Mats: Trim-Tack Adhesive mats by Markell Industries, Manchester, CT or equal. At carpet floors provide "Velcro Brand Carpet"* protection in lieu of sticky mats.
- B. Electrical Materials
1. Power Receptacles: 15 ampere, 120 volt, duplex grounding type with ground fault circuit interrupters. Furnish in suitable boxes with hinged cover plates.
 2. Light Fixtures and Lamps: Medium-base, rubber pigtail, type lamp sockets or porcelain lamp holders furnish with boxes, and lamps.
 3. Conductors: insulated copper or aluminum, with phase conductor insulation rated for the circuit voltage, and insulation or jacketing suitable for the conditions, and branch circuit conductors - No. 12 AWG minimum size, except No. 10 AWG where length of branch circuit exceeds 100 feet.
- C. Mechanical Materials
1. Portable Equipment may be new or used, temporary units that will not damage construction materials or processes, that will not create unhealthy conditions for workers, and that can be operated with approval from the authorities having jurisdiction.

PART 3 - EXECUTION

3.1 REMOVAL

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

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions

1.2 PRODUCTS

- A. Product: means new material, machinery, components, equipment, fixtures and systems forming Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of Work. Products may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- C. Provide interchangeable components from the same manufacturer.

1.3 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.

1.4 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground and protect as necessary to prevent deterioration or damage to the product.
- C. When approved by the Owner, provide off-site storage and protection in a bonded warehouse approved by Owner when site does not permit on-site storage or protection at no cost to Owner.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

- E. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to ensure products are undamaged and are maintained under specified conditions.

1.5 PRODUCT OPTIONS

- A. Where products are specified by reference standards or by description only, provide products meeting those standards or that description, made by a manufacturer acceptable to Architect.
- B. Where products are specified by naming one or more manufacturers, provide products of one of the named manufacturers that meets or exceeds specifications.
- C. Where any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction is indicated or specified by name, make, trade name, or catalog number, whether with or without the phrase "or equal," such specification shall be deemed to establish the minimum qualities of function, dimension, appearance, and performance (collectively the Basis of Design) for that material, process, or article. Such specification shall be deemed to be followed by the phrase "or equal."
- D. If a named product, or named manufacturer's equivalent product does not fully meet the specification, that manufacturer shall provide a custom or modified product to meet the specification.
- E. Where expressly noted "no substitutions" in individual Sections, no product options are permitted.
- F. When the phrase "or equal" is used or implied, it shall mean "an equivalent product, approved by the Architect in accordance with the requirements of this Section."
- G. Products, proposed as substitutions, shall conform to requirements listed in the respective Section of this Manual and have at least 10 successful installations in commercial projects similar in scale and complexity to those required for this Project that have been in service for minimum of 5 years and remain in satisfactory condition.

1.6 SUBSTITUTIONS

- A. Manufacturers and products listed in Specifications form basis for design and quality intended. Bidders may propose substitutions of equal design and quality and must be accompanied by completed Request Form included at end of this Section, other forms not permitted. Submit separate form for each proposed substitution. Except for Sections listed on the Finish Schedule that require submittal prior to bid, all substitution requests shall be submitted as required herein.
 - 1. Substitution requests, if any, shall be submitted to Architect within 5 calendar days after bid opening. Architect will issue acceptance or rejection of request.

- B. Substitutions must clearly be in Owner's best interest because of quality, cost, performance, conformity to code requirements or availability. Architect will make decision as to acceptance of proposed substitution.
1. Submittal of proposed substitutions shall be made only by Prime Contractor(s). Architect will not review direct submittal by manufacturers, suppliers or subcontractors.
 2. Burden of proof as to equality of any material, process or article shall rest with Contractor. Provision authorizing submissions of "or equal" justification data shall not in any way authorize an extension of time for performance of this Contract.
 3. Substitutions shall, without exception, be manufactured of same basic materials and comply with or exceed all Specification requirements of dimension, function, structure and appearance, without deviation. Provide itemized comparison of quality and performance.
 4. Use of approved substitutions shall in no way relieve Contractor from responsibility for compliance with Contract Documents after installation. Contractor shall assume all extra costs caused by use of approved substitute materials.
 5. Statement indicating why specified material or product cannot be provided.
 6. Coordination information, including list of changes or modifications needed to other parts of Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 7. Detailed side by side comparison of significant qualities of proposed substitution with those of the Work specified. Mark clearly affected specification Section for any differences from item specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect and specific features and requirements indicated.
 8. Product Data Samples, including drawings and descriptions of products and fabrication and installation procedures.
 9. List of similar installations for completed projects with project names and addresses and names and addresses of Architects and Owners.
 10. Material test reports from qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 11. Cost information, including a proposal of change, if any, in the Contract Sum.
 12. Substitutions for specified product, brand or manufacture that have been submitted and disapproved by Architect shall not be resubmitted in any modified form.
 13. In case materials are substituted and installed without proper authorization, Contractor shall remove such materials and install those specified at his own expense.
 14. Contractor shall determine effect approved substitutions will have on other portions of Work and so inform his subcontractors and employees of these effects.

15. Acceptance of proposed substitution shall be determined solely by specifying Architect. The final decision shall be the Architect's in accordance with the General Conditions.
- C. Substitutions may be considered when product becomes unavailable through no fault of Contractor. Provide letter from manufacturer, on manufacturer's letterhead, stating lack of availability.
- D. Unacceptable Substitutions: substitution requests initiated by late submittals that have caused materials to become unavailable due to delay in ordering and procurement will not be acceptable reason for substitutions.
- E. Provide same warranty for substitution as for specified product.
- F. Contractor shall pay costs for time required by Architect for review and for any redesign services associated with substitutions and for costs of re-approval by Regulatory Agencies.
- G. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request.
- H. Each subcontractor is responsible for providing products and construction methods compatible with products and construction methods of other subcontractors. If dispute arises between subcontractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.
- I. Substitution Submittal Procedure: In accordance with the General Conditions, Division 01, General Requirements for Administrative Requirements and this Section.
- J. All Substitutions for any material, system or product that would otherwise be regulated by DSA shall be included in an Addendum or Form DSA-140, and shall be approved by DSA prior to fabrication or use. (CAC Section 4-338(c) and IR A-6)
- K. Pursuant to Public Contract Code section 3400(c), the DISTRICT made findings pursuant to Public Contract Code section 3400 that a particular material, product, thing, or service is designated by a specific brand or trade name in order to (a) match other products in use on a particular public improvement either completed or in the course of completion, or (b) obtain a necessary item that is only available from one source, the DISTRICT shall not be required to comply with the provisions of the preceding paragraph. The following is a list of approved standards based on the findings made by the DISTRICT in accordance with Public Contract Code section 3400. No substitutions will be allowed.
1. Refer to application specifications for additional details.
 2. Board Approved District Standards: Collins & Aikman Flooring, Carrier HVAC, Tremco Roofing, Allerton Energy Management Controls, Vista Paint, Floorseal Technologies (Kitchen and Restroom Flooring), Edwards Fire Alarms, Best Locks, Dal-Tile, Sloan Flush Valves, Chicago Faucets, Chatfield Clarke (Tackable Surface), Seasons Four Multi-Zone HVAC Units, CalSense Irrigation Controllers, Audio Visual : Extron, IP Speakers/Clocks: Advanced Network Devices

A

1.7 OWNER-FURNISHED, OWNER-INSTALLED WORK (OFOI)

- A. Indicate in construction progress schedule owner-furnish owner-installed items and schedule time for installation.
- B. Items indicated on Drawings as OFOI will be furnished by Owner and installed by Owner. Work indicated as OFOI will be performed under separate contract employees by Owner at its discretion. Where work of this Contract adjoins or conflicts with OFOI, work, Contractor shall cooperate with Owner and its employees in manner that will provide for reasonable and accurate completion of this Contract and work under separate contact.
- C. Coordinate with OFOI work affecting this contract. Including verification and interfacing of this contract with OFOI work.

1.8 OWNER-FURNISHED, CONTRACTOR-INSTALLED WORK (OFCI)

- A. Indicate in the construction progress Schedule Owner-Furnish Contractor-Installed items and schedule time for their installation.
- B. Contractor shall verify exact sizes and services required for each item of equipment indicated on Drawings or in Project Manual as OFCI and shall obtain from Owner rough-in drawings, diagrams, setting templates and other necessary information to ensure proper mating of assemblies.
- C. Contractor shall receive at project site each item of equipment from Owner and from that time on shall assume full responsibility for items and equipment until one year from date of Certified Completion.
- D. Contractor shall give Owner 15 days prior notice of requirements for delivery to site of all OFCI equipment.
- E. Contractor shall be responsible for receiving OFCI items and equipment and shall uncrate, inspect and notify Owner in writing within 7 days of receiving said items or equipment of acceptance or rejection of items or equipment. Owner, after receiving notice, will take appropriate action to have items or equipment made acceptable for Contractor's use. Rejected items shall be carefully stored and protected from damage by Contractor until Owner takes appropriate action.
- F. Contractor shall be responsible for final placing, installation, connection, start-up, checking, testing and demonstrated satisfactory operation. Owner will provide names of manufacturer's representatives, who shall assist the Contractor in checking, testing and demonstrating equipment.

- G. Contractor shall be responsible for the installation of the following items that are Owner Furnished:
 - 1. Network Switches
 - 2. Wireless Access Point (WAP)
 - 3. Television Monitors and Mounts



PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SUBSTITUTION REQUEST FORM

Project: _____ Substitution Request Number: _____
To: SGH Architects, Inc. From: _____
Re: _____ Date: _____
Architect's Project Number: _____ Contract For: _____
Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____
Proposed Substitution: _____
Manufacturer: _____ Address: _____
Trade Name: _____

Attached data shall include: product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitutions will require for its proper installation, at no cost to the Owner.

The Undersigned Certifies:

- Proposed substitution has been fully investigated and determined shall be equal or superior in respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing and construction costs caused by the substitutions.
- Reason(s) why substitution is being submitted.
 - ☐ Specified product or material is not available. Explain in detail as attachment.
 - ☐ Cost savings to Owner. Indicate comparative cost analysis as attachment.
 - ☐ Other. Explain: _____

Submitted by: _____
Signed by: _____
Firm: _____
Address: _____

Telephone: _____

A/E's REVIEW AND ACTION

- ☐ Substitution Approved
- ☐ Substitution Rejected as marked below:
- ☐ Insufficient information submitted
 - ☐ Submitted late.
 - ☐ Information not clearly marked.
 - ☐ Full line product information (Binder not provided).
 - ☐ Does not meet performance / design requirements of Paragraph _____
 - ☐ Comparisons not properly identified on product data sheets.

Signed by: _____ Date: _____

Substantiating Data Required:

☐ Drawings	☐ Tests if required in individual sections
☒ Product Data	☐ Reports if required in individual sections
☒ Samples	☐ Other: _____

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.

SECTION 01 78 00
CLOSE OUT SUBMITTALS

- 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.

**SECTION 01 78 00
CLOSE OUT SUBMITTALS**

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

SECTION 01 79 00 – DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

- A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.
- B. Training of District personnel in operation and maintenance is required for:
 - 1. All software-operated systems.
 - 2. HVAC systems and equipment.
 - 3. Electrical systems and equipment.
 - 4. Items specified in individual product Sections.
- C. Training of District personnel in care, cleaning, maintenance, and repair is required for:
 - 1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
 - 2. Finishes, including flooring, wall finishes, ceiling finishes.
 - 3. Fixtures and fittings.
 - 4. Items specified in individual product Sections.

1.2 RELATED REQUIREMENTS

- A. ~~Section 01 91 13 – General Commissioning Requirements (if required): Additional requirements applicable to demonstration and training.~~
- B. Other Specification Sections: Additional requirements for demonstration and training.

1.3 SUBMITTALS

- A. See Section 01 33 00 – Submittal Procedures.
- B. Training Plan: District will designate personnel to be trained; tailor training to needs and skill-level of attendees.
 - 1. Each Sub, Design-Builder SubContractor and vendor responsible for training submits a written training plan to the Architect and District Representative for review and approval prior to training.
 - 2. Submit to Architect for transmittal to District.
 - 3. Submit not less than four weeks prior to start of training.
 - 4. Revise and resubmit until acceptable.

5. Provide an overall schedule showing all training sessions.
6. Include at least the following for each training session:
 - a. Identification, date, time, and duration.
 - b. Description of products and/or systems to be covered.
 - 1) Equipment list
 - c. Name of firm and person conducting training; include qualifications.
 - d. Intended audience, such as job description.
 - e. Objectives of training and suggested methods of ensuring adequate training.
 - 1) Agenda and subjects (design intent, equipment inspections, modes of operation, system interactions, troubleshooting, preventative maintenance, etc.)
 - f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
 - g. Media to be used, such as slides, hand-outs, etc.
 - 1) The approved O&M manuals shall be used during the training for equipment specific references.
 - h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
 1. Include applicable portion of O&M manuals.
 2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
 3. Provide one extra copy of each training manual to be included with operation and maintenance data.
- D. Training Reports:
 1. Identification of each training session, date, time, and duration.
 2. Sign-in sheet showing names and job titles of attendees.
 3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
 4. Include Commissioning Authority's formal acceptance of training session.
- E. Video Recordings: Submit digital video recording of each demonstration and training session for District's subsequent use.
 1. Format: DVD Disc.
 2. Label each disc and container with session identification and date.

1.4 QUALITY ASSURANCE

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
 - 1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
 - 2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 TRAINING OF OWNER PERSONNEL

- A. The Contractor and Design-Builder SubContractors shall be responsible for training coordination and scheduling and for ensuring that training is completed.
- B. The Commissioning Authority (CA) shall be responsible for reviewing and approving the content of the training of Owner personnel for commissioned equipment.
- C. The specific training requirements of District personnel by Subs, Design-Builder SubContractors and vendors is specified in the Division in which the equipment is specified.
- D. For primary HVAC equipment, the Controls Contractor shall provide a short discussion of the control of the equipment during the mechanical or electrical training conducted by others.

3.2 DEMONSTRATION - GENERAL

- A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by District.
- B. Demonstrations conducted during Functional Testing need not be repeated unless District personnel training is specified.
- C. Demonstration may be combined with District personnel training if applicable.
- D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
 - 1. Perform demonstrations not less than two weeks prior to Substantial Completion.
 - 2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
 - 1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.3 TRAINING - GENERAL

~~A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.~~



B. Conduct training on-site unless otherwise indicated.

C. District will provide classroom and seating at no cost to Contractor.

~~D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.~~



E. Provide training in minimum two hour segments.

~~F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.~~



G. Training schedule will be subject to availability of District's personnel to be trained; re-schedule training sessions as required by District; once schedule has been approved by District failure to conduct sessions according to schedule will be cause for District to charge Contractor for personnel "show-up" time.

H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:

1. The location of the O&M manuals and procedures for use and preservation; backup copies.
2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
3. Typical uses of the O&M manuals.

I. Product- and System-Specific Training:

1. Review the applicable O&M manuals.
2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
4. Provide hands-on training on all operational modes possible and preventive maintenance.
5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
6. Discuss common troubleshooting problems and solutions.
7. Discuss any peculiarities of equipment installation or operation.

**SECTION 01 79 00
DEMONSTRATION AND TRAINING**

8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
 9. Review recommended tools and spare parts inventory suggestions of manufacturers.
 10. Review spare parts and tools required to be furnished by Contractor.
 11. Review spare parts suppliers and sources and procurement procedures.
- J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Remove all existing gypsum wall board at roof framing, wall framing/furring, flooring, ceiling systems, mechanical, plumbing, lighting, electrical and associated bracing, suspension construction, building equipment, fixtures, components and utilities to permit installation of new construction.
- B. Include Work required to demolish and remove elements of existing construction including sitework, sitework utilities and similar elements of existing building construction, all as noted on Drawings or as required to permit installation of new construction. Refer to Cutting and Patching in Section 01 70 00 for differentiation between "Demolition" and "Cutting and Patching".
- C. Comply with Title 24, Part 9, California Fire Code, Chapter 33 Fire Safety During Construction and Demolition, during all Phases of project.
- D. Contractor shall protect and maintain operable utilities feeding the campus until new work cross over is available.

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. CBC - 2022 California Building Code
 - 1. CBC-19A - CBC Chapter 19A, Concrete.
 - 2. CBC-33 - CBC Chapter 33, Safeguards During Construction
- C. CCR - California Code of Regulations
 - 1. CCR-8.4 - Title 8, Subchapter 4, Construction Safety Orders
- D. CFC - 2022 California Fire Code
 - 1. CFC-5 - CFC Chapter 5, Fire Service Features
 - 2. CFC-7, CFC Chapter 7, Fire-Resistance-Rated Construction
 - 3. CFC-9 - CFC Chapter 9, Fire Protection Systems
 - 4. CFC-33 - CFC Chapter 33, Fire Safety During Construction and Demolition
- E. ICRI - International Concrete Repair Institute.
- F. NFPA - National Fire Protection Association
 - 1. NFPA 241- Safeguarding Construction, Alteration and Demolition Operations

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Demolition Conference: Conduct conference at Project site to comply with below

and requirements in Section 01 30 00.

- B. Contractor shall schedule meeting after Notice of Award to review demolition operations.
- C. Attendance Required: Owner, Architect, Contractor, Demolition Subcontractors, Project Inspector.
- D. Construction Process:
 - 1. Contractor shall discuss overview of demolition procedures.
 - 2. Contractor shall identify items to be selected by Owner for salvage.
 - 3. Contractor shall review special requirements for equipment, safety, and noise.
- E. Architect will record minutes and distribute copies within seven days after meeting to participants and those affected by decisions made.
- F. Regulatory Requirements: Secure demolition permit from the Local Air Quality Management District for renovations involving the removal of 100 square feet/linear feet or greater of demolition, per District Regulations. Notify the AQMD at least 10 working days prior to commencement of demolition/renovation.

1.4 SUBMITTALS

- A. Project Record Documents accurately record actual locations of capped utilities.
- B. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Division 01. Submit before Work begins.

1.5 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.

PART 2 - PRODUCTS

2.1 NOT USED.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Disconnect, remove and cap designated utility services within demolition areas. Notify Owner 48 hours in advance of any utility shut-down.
- B. Prior to commencement of demolition operations, notify Underground Service Alert of Southern California (800) 422-4133, Monday through Friday, 7:00 A.M. to 5:00 P.M.
- C. Protection:
 - 1. Protect existing items that are not indicated to be altered.
 - 2. Adequately protect staff and public from harm and accident during demolition operations by the erection of proper barricades, signs, lighting, guard rails or other safety precautions. Conform to Title 8, Subchapter 4, CCR and NFPA 241.
 - 3. Protective Devices: Install substantial enclosures, weatherproof and dust-proof shields, protective covers, screens and similar devices. Erect and move when necessary to permit use of existing rooms, areas or facilities. Remove entirely when their use is no longer essential. Patch or repair all areas where devices have been removed.
- D. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs or video.
 - 1. Comply with requirements specified in Division 01.
 - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3.2 TEMPORARY MEASURES - LIFE SAFETY

- A. Emergency Exits: No enclosure, shield or protective covering shall interfere with use of emergency exits in existing facilities at any time. Rated egress systems shall provide temporary rated egress.
- B. Maintain fully charged certified compliant fire extinguishers and water hoses readily available during demolition operations, per Section 906 CBC. Test electrical conductors for disconnection prior to removing.
- C. Provide temporary, but equivalent, fire alarm, detection or suppression systems when any system is impaired by Work of this Section. Temporary systems shall be inspected and tested monthly or at other more frequent intervals as required by Owner.
- D. Impairment of fire protection systems, California Fire Code, CHPT. 35/Section 3308.6: Impairments to any fire protection system shall be in accordance with Section 901.
 - 1. Systems out of Service: Per requirement of Section 901.7 through 901.7.6, California Fire Code.

- E. Maintain free and unobstructed access to emergency services per Title 19, CFC 503.1; 503.1.1, 503.4; and Appendix D, CFC Chapter 33 Sections 3310.1; 3312.1 and when required by Owner.
- F. Post NO SMOKING signs in English and Spanish, in number and location as approved by Architect.
- G. Reduce flammable and combustibile fire load to minimum by daily removal of debris.
- H. Instruct construction personnel in fire safety and fire drill policies appropriate for areas where demolition operations occur.
- I. Deployment, disposition, administration and implementation of any and all safety measures shall be sole responsibility of Contractor.

3.3 EXECUTION

- A. Demolish in orderly and careful manner. Maintain protected egress and access at all times.
- B. Except where noted otherwise, immediately remove demolished materials from site and dispose legally. Do not utilize Owner's disposal system.
- C. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect until re-installation.
- D. Do not burn or bury materials on site.
- E. Upon completion of Work, leave areas of Work in clean condition.

3.4 SELECTIVE DEMOLITION, REPAIR AND ALTERATIONS WORK

- A. New and existing Work that is cut into, altered, damaged, relocated or reinstalled shall be restored to original conditions. Workmanship and materials to conform to applicable provisions of other applicable Sections of Specifications.
- B. Cutting Equipment: Jackhammers and vibratory cutting equipment may be utilized under following conditions:
 - 1. Approval by Owner.
 - 2. Time of day and duration of Work on each given day shall be coordinated with Project Inspector and Owner. Minimum of 24 hours advance notice required.
 - 3. Compressors shall be well muffled.
 - 4. Every consideration shall be exercised toward comfort of staff and public. Excessive noise or vibrations will constitute just cause for immediate stoppage of Work.
- C. Cutting:
 - 1. Conform to Provisions of Division 01, General Requirements.

2. Concrete: Cut with saws or other approved method, but do not overcut openings. Reinforcing bars, except where bonded into new concrete, shall be cut off and ends painted with bituminous paint before being enclosed.
 3. Structural Members: Cut only when authorized by Architect and approved by Structural engineer of Record, and DGS/DSA. Agency approvals shall be obtained by Architect, not by Contractor.
- D. Asphalt Paving: Sawcut edge and remove AC paving including sub-base where indicated in drawings and disposed in legal dumpsites, crushing operations on site and re-use of pulverized AC not permitted.
- E. Remove AC striping, lettering, game lines and markings by wet sandblasting machine with sufficient sand, water, and air capacity to completely remove existing striping, [game lines] or markings. Machine shall meet all requirements of air pollution control district having jurisdiction. Conform to Section 310-5.6.3 Standard Specifications for Public Works Construction.
- F. Removal of concrete flatwork: remove concrete paving (panel) to the nearest expansion joint or contraction joint and provide matching concrete surface to abut to new work at same finish levels unless noted otherwise.
- G. Holes required through existing stud wall, concrete or masonry construction to accommodate new electrical conduits and piping and ductwork shall be provided as specified in Division 22, Plumbing; Division 23, Heating Ventilating and Air Conditioning; Division 26, Electrical and Division 27 Communications. Provide proposed routing of utilities as required in Coordinated Drawing, Division 01, General Requirements.
- H. Holes required through concrete or masonry Work required for structural purposes shall be neatly drilled as required to accommodate specific items. Coring shall be performed with approval of Architect and in accordance with details on Drawings.
1. Approval of details by DGS/DSA is required. Agency approvals shall be obtained by Architect, not by Contractor.
- I. Work shall be fully coordinated to ensure proper sequence, limits, methods and time of performance. Arrange Work so as to impose a minimum of hardship on present operation of facilities.
- J. Remove underside of roof assembly existing gypsum board sheathing, insulation and such existing ceilings, floors, walls, finish materials or equipment as required to complete Work. Restore such surfaces to their original condition after Work is completed.
- K. Provide adequate ventilation during all operations to prevent accumulation of dust, fumes, vapors or gases.
- L. Miscellaneous Removal Items: Items not specifically mentioned shall be removed as indicated on drawings.
- M. Miscellaneous Work: Items not specifically mentioned shall be repaired, patched or finished like new Work or to match existing adjoining surfaces as approved. Surfaces

damaged shall be restored to original condition.

3.5 SALVAGE AND DISPOSAL

- A. Disposal: Removed material, other than items directed to be salvaged or indicated to be reused, become Contractor's property upon removal, and shall be removed from site. Debris shall be picked up and disposed of, off site, by Contractor promptly and continuously as Work progresses, and not allowed to accumulate. Sprinkle the debris to prevent dust nuisance. Secure and pay for required hauling permits and pay dumping fees and charges. Contractor shall make every reasonable effort to divert debris to recycling or reuse facilities.

END OF SECTION

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 01 35 42 – CalGreen Requirements
3. Section 03 20 00: Concrete Reinforcing.
4. Section 03 30 00: Cast-In-Place Concrete.

1.2 REFERENCES

A. American Concrete Institute (ACI) Publication:

1. ACI 318 – Building Code Requirements for Structural Concrete, Chapter 6, Formwork, Embedded Pipes, and Construction Joints.
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. Special Environmental Requirements Product Submittal Form, found in Appendix A of Section 01 35 43 Special Environmental Requirements. Provide the following information for all concrete formwork: 1 Local/Regional Materials.~~

C. Shop Drawings: Submit Shop Drawings indicating locations of forms, construction and expansion joints, embedded items, and accessories.

D. 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.
- D. Reglets and Rebates: As specified in Section 03 30 00: Cast-In-Place Concrete.

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 03 30 00: Cast-In-Place Concrete.

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

THIS PAGE INTENTIONALLY LEFT BLANK

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: Site Concrete Work.
 - 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/CC Sections 1903A and 1908A.
- 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/CC, Section 1903A.3.
 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/CC Section 1704A.4.3. 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/CC Chapter 17A, Reinforcement and Anchor testing per CBC-SS/CC Section 1916A and Specification Section 01 4523.

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/CC Section 1903A.3, provided that the workability and methods of consolidation are such that the concrete can be placed without honeycombs or voids.
- C. Water: 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 3.6.
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 Sections 3.6.6 and 3.6.7 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.
- E. Reinforcement Fibers: Chop strands of alkali-resistant polypropylene or nylon fibers added to the concrete mix for protection against shrinkage cracks.
- F. Expansion Joint Fillers: Preformed strips, non-extruding and resilient bituminous type, of thickness indicated, conforming to ASTM D1751.
- G. Curing Paper: Shall conform to ASTM C171 and consist of two sheets of kraft paper cemented together with a bituminous material in which are embedded cords or strands of fiber running in both directions. The paper shall be light in color, shall be free of visible defects, with uniform appearance.
- H. Floor Hardener: Water soluble, inorganic, silicate-based curing, hardening, sealing and dustproofing compound. Aquaseal W20 by Monopole Inc., Kure-N-Harden by BASF, Chem Hard by L&M, Liqui-Hard by W. R. Meadows, or equal.
- I. Underlayment: Two component latex underlayment for filling low spots in concrete for both interior and exterior applications, from featheredge to a maximum of 3/8 inch in thickness. Underlayment shall be non-shrink and suitable for repairing exposed concrete surfaces and for underlayment of carpet, resilient, tile and quarry floor coverings. La-O-Tex by TexRite, Underlay C, RS by Mer-Krete Systems, Underlayment 962 by C-Cure, or equal.
- J. Vapor Barrier: Polyolefin-based 15 mils minimum thickness, meeting or exceeding ASTM E1745, 10 feet minimum width. Permeance shall be less than 0.01 perms [grains/(ft²*hr*inHg)] as determined by ASTM E96 or ASTM F1249 and after mandatory

conditioning tests per ASTM E154 Sections 8, 11, 12, & 13. Include accessories including tape and/or mastic. Stego Wrap by Stego Industries LLC, Perminator by W.R. Meadows, Ecoshield-E by Epro, or equal.

- K. Stair Strips and Nosing: Nystrom two part stair treads and nosings.

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/CC Sections 1905A.1 through 1905A.13. Concrete mix shall meet the durability requirements of ACI 318, Chapter 4.
- C. Concrete proportioning shall be determined on the basis of field experience and/or trial mixtures shall in accordance with ACI 318, Section 5.3. 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	3,000	4 inch	1" Normal wt. concrete
Slabs	3,000	4 inch	¾" Normal wt. concrete
Other	3,000	4 inch	¾" Normal wt. concrete

PART 3 - EXECUTION

3.01 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 Pl. 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.
2. Where slabs are to receive separate cement finish or mortar setting bed, continued tamping to raise mortar to surface is not performed. Laitance shall be removed by brushing with a stiff brush or by light sandblasting to expose clean top surface of coarse aggregate.

E. Floating and Troweling:

1. When concrete has hydrated sufficiently, it shall be floated to a compact and smooth surface. After floating, wait until concrete has reached proper consistency before troweling. Top surfaces shall receive at least 2 troweling operations with steel hand trowel. Prior to and during final troweling, apply a fine mist of water frequently with an atomizing type fog sprayer. Omit troweling for slabs to receive a separate cement finish.
2. For interior finish slabs, final troweling shall provide a hard, impervious, and non-slip surfaces, free from defects and blemishes. Finished surface shall be within tolerances indicated in Article 3.02. Avoid burnishing. Do not add cement or sand to absorb excess moisture.
3. Exterior Paving and Cement Walks: Finish as specified above, except surface shall be given a non-slip broom finish to match Sample reviewed by the Architect.
4. Vertical concrete surfaces shall be finished smooth and free from marks or other surface defects.

F. Curing:

1. Length of time, temperature and moisture conditions for curing concrete shall be in accordance with ACI 318, Section 5.11.
 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. If weather is hot or surface has dried out, spray surface of concrete slabs and paving with fine mist of water, starting not later than 2 hours after final troweling and continuing until sunset. Surface of finish shall be kept continuously wet until curing medium has been installed.
 4. Immediately after finishing, monolithic floor slabs shall be covered with curing paper. Paper shall be lapped 4 inches at joints and sealed with waterproof sealer. Edges shall be cemented to finish. Repair or replace paper damaged during construction operations.
- G. Filling, Leveling and Patching:
1. Concrete slabs exhibiting high or low spots and indicated to receive resilient floor covering or soft floor covering, shall have surfaces repaired. High spots shall be honed, or ground with power-driven machines to required tolerances. Low spots shall be filled with latex underlayment, installed in strict accordance with manufacturer's written recommendations.
 2. Holes resulting from form ties or sleeve nuts shall be solidly packed, through exterior walls, by pressure grouting with cement grout, as specified. Grouted holes on exposed surfaces shall be screeded flush and finished to match adjoining surfaces.
- H. Cement Base: Cement base shall be of the height, thickness, and shape detailed. Base shall be reinforced with one inch mesh, 18 gage, zinc-coated wire fabric. Base finish mixture shall be one part Portland cement, 2 parts of fine aggregate and one part pea gravel. Colored cement base shall include a chemically inert mineral oxide pigment in the mix.

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. Floor Hardener: Exposed interior concrete floors throughout shall be treated with floor hardener.
1. Protect adjacent surfaces. Clean surfaces to receive treatment in accordance with manufacturer's instructions, ensuring that all stains, oil, grease, form release agents, laitance, dust and dirt are removed prior to application.
 2. Apply hardener in accordance with manufacturer's instructions as soon as concrete is firm enough to work on after final troweling.
- F. 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.
- G. Broom Finish: Exterior stair treads and landings shall be provided with a non-slip broom finish in addition to abrasive finish specified.
- H. Abrasive Stair Nosing: Nosing shall be installed according to manufacturers written recommendations.

3.6 EXPANSION AND CONSTRUCTION JOINTS

- A. Construction Joints: Details and proposed location of construction joints shall be as indicated on the Drawings, located to least impair strength of structure, in accordance with the following:
1. Thoroughly clean contact surface by sand blasting entire surface not earlier than 5 days after initial placement.
 2. A mix containing same proportion of sand and cement provided in concrete plus a maximum of 50 percent of coarse aggregate shall be placed to a depth of at least one

inch on horizontal joints. Vertical joints shall be wetted and coated with a neat cement grout immediately before placing of new concrete.

3. Should contact surface become coated with earth, sawdust, or deleterious material of any kind after being cleaned, entire surface shall be re-cleaned before applying mix.
- B. Expansion Joints: Provide expansion joints where indicated in walks and exterior slabs. Space approximately 20 feet apart, unless otherwise indicated. Joints shall extend entirely through slab with joint filler in one piece for width of walk or slab. Joint filler shall be 3/8 inch thick, unless otherwise indicated.
- C. Tooled Joints: Slabs, walks and paving shall be marked into areas as indicated with markings made with a V-grooving tool. Marks shall be round-edged, free from burrs or obstructions, with clean cut angles and shall be straight and true. Walks, if not indicated, shall be marked off into rectangles of not more than 12 square feet and shall have a center marking where more than 5 feet wide.

3.7 TESTING

- A. Molded Cylinder Tests:
 1. 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.
 2. 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.
 3. 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/CC 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 1000 Concrete Forming and Accessories, and reinforced as described in Section 03 2000 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

SECTION 04 21 00 – CLAY UNIT MASONRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Clay masonry units and accessories including:
 - 1. Facing brick.
- B. Steel reinforcement
- C. Anchors and ties
- D. Flashing
- E. Expansion joints
- F. Weepholes
- G. Mortar

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. ~~Section 07 25 00 – Weather Barriers.~~
- B. Section 07 62 00 - Flashing and Sheet Metal.



1.3 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.

- B. ~~Section 07 25 00 – Weather Barriers.~~



1.4 REFERENCE STANDARDS

- A. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- B. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- C. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
- D. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
- E. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
 - 1. CBC – California Building Code, 2022. Section 1404.7
 - 2. CBC – California Building Code. 2022, Chapter 21.
 - 3. California Building Standards Code, CALGreen – 2022.
- F. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

1.5 SUBMITTALS

- A. Brick: Manufacturer's letter of certification, including:

1. Test reports.
2. Cleaning recommendations.
- B. Other Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Samples: Furnish not less than five individual brick as samples, showing extreme variations in color and texture.
- D. Sample Panel: Mock-up or sample panels shall be used to review brick and mortar color and serve as the standard of workmanship for the Project.
 1. Approximately 4 feet long by 3 feet high, showing the proposed color range, texture, bond, mortar, and workmanship. Use all the brick shipped for the sample in assembling the sample panel.
 2. When required, provide a separate sample panel for each type of brick or mortar.
 3. Do not start work until the Architect/Engineer has accepted the sample panel.
 4. Use panel as a standard of comparison for all masonry work built of the same material.
 5. Do not destroy or move the panel until work is completed and accepted by Architect.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 years manufacturing similar products.
- B. Installer Qualifications: Minimum 2 years installing similar products.
- C. Brick Tests: Sample and test shall be in accordance with ASTM C67.
- D. Test Reports:
 1. An independent laboratory shall complete testing and reports.
 2. Test reports for each type of building and facing brick shall be submitted to the Architect/Engineer for review.
 3. Test reports shall indicate:
 - a. Compressive strength.
 - b. 24-hour cold water absorption.
 - c. 5-hour boil absorption.
 - d. Saturation coefficient.
- E. Certificates: Before delivery, submit to Architect/Engineer certificates attesting compliance with the applicable specifications for grades, types, or classes included in these specifications.
- F. Costs of Tests: The cost of tests shall be borne by the purchaser unless tests indicate that units do not conform to the requirements of the specifications, in which the seller shall pay the case cost.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store brick off the ground to prevent contamination by mud, dust, or other materials likely to cause staining or other defects.
- C. Cover all materials with a non-staining waterproof membrane material when necessary to protect from elements.
- D. Store different types of materials separately.

1.8 PROJECT CONDITIONS

- A. Protection of Work:
 - 1. Wall Covering:
 - a. During construction, cover the top of the wall with a durable non-staining waterproof membrane at the end of each day or shutdown.
 - b. Cover partially completed walls when work is not in progress.
 - c. Extend cover minimum of 24 inches down both sides.
 - d. Hold the cover securely in place.
 - 2. Load Applications:
 - a. Do not apply uniform floor or roof loading for at least 12 hours after building masonry columns or walls.
 - b. Do not apply concentrated loads for at least three days after building masonry columns or walls.
 - 3. Stain Prevention:
 - a. Prevent grout or mortar from staining the face of the masonry.
 - b. Remove grout or mortar immediately in contact with the face of such masonry.
 - c. Protect all sills, ledges, and projections from droppings of mortar.
 - d. Protect the base of the wall from rain-splashed mud and mortar splatter.
 - e. Scaffold boards shall be turned on edge when work is not in progress.
- B. Hot Weather Protection:
 - 1. Construction Requirements While Work is Progressing:
 - a. When the temperature exceeds 100 degrees F or 90 degrees F with 8 mph wind.
 - 1) Maintain the temperature of mortar and grout between 70 degrees F and 120 degrees F.
 - a) Limit spread of mortar bed to 4 feet. Place units within 1 minute of spreading mortar.
 - 2) Partially or recently completed walls may be fog sprayed and/or covered with opaque plastic or canvas or both to control moisture evaporation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer for Clay Unit Masonry:
 - 1. Belden Brick Company, www.beldenbrick.com
 - 2. Boral Brick Company, USA.
 - 3. Mutual Materials, www.mutualmaterials.com
 - 4. RCP Block and Brick, www.rcpblock.com
- B. Or equal as approved in accordance with Division 01. General Requirements for substitution.

2.2 CLAY MASONRY UNITS

- A. Facing Brick: ASTM C 216, Grade SW,
 - 1. Face Brick: 5 3/8" tall x 3" wide x 15 3/8" long to match existing brick.
- B. Minimum Compressive Strength: ASTM C67.
- C. Maximum Initial Rate of Absorption (IRA): ASTM C67, C/B Ratio.
- D. Provide brick similar in texture, color, and physical properties to those available for inspection at the Architect/Engineer's office and/or as supplied on the approved sample panel.
- E. All brick supplied shall be pre-blended by the manufacturer.

2.3 ANCHORS AND TIES

- A. Corrugated Ties: ASTM A 1008, 22 Gage, Width: 7/8", length: 7", Galvanized: ASTM A 153, Class B-2.

2.4 FLASHING

- A. Copper: ASTM B 370, 5 oz.

2.5 EXPANSION JOINTS

- A. Premolded Foam: ASTM D 1056, Type 2, Class A, Grade 1.
- B. Neoprene: ASTM D 1056, Type 2, Class A, Grade 1.
- C. Backer Rod: Extruded, Closed Cell Polyethylene.

2.6 ACCESSORIES

- A. Weepholes:
 - 1. Rope Wicks: Cotton Sash Cord, 12 inches long with end laid in a cavity.
 - 2. Plastic Tubes: 1/4 inch minimum inside diameter by 4 inches long.

- 3. Aluminum Weep/Vents.
- 4. Plastic Weep/Vents.

2.7 MORTAR

- A. Mortar shall conform to ASTM C 270 under the guidelines provided in BIA Technical Notes No. 8 Series.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify the Architect of inadequate preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to before installation.
- B. Cleaning Reinforcement: Remove mud, loose rust, ice, and other coatings from reinforcement that would interfere with the bond.
- C. Prepare surfaces using the methods recommended by the manufacturer to achieve the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. For thin brick, install following the manufacturer's thin brick system or adhesive manufacturer's instructions.

3.4 BONDING

- A. Lay masonry in bond pattern as indicated on drawings or general notes. Reference BIA Technical Note 30 for additional requirements.

3.5 LAYING MASONRY

- A. Lay masonry with full head and bed joints.
- B. Lay all brick plumb and true to lines.
- C. Where fresh mortar joins partially set mortar, remove loose brick and mortar, and lightly wet exposed surface of set masonry.
- D. Toothing shall be subject to approval by the Architect/Engineer.
- E. When adjustment is necessary to be made after mortar begins to harden, remove hardened mortar, and replace it with fresh mortar.

3.6 TOOLING AND POINTING

- A. Joint Profile: Tool mortar joints to a concave appearance.
- B. Joint Profile: Tool mortar joints to a concave V-shaped appearance.
- C. Joint Profile: Tool mortar joints to a concave grapevine appearance.
- D. Tool exposed joints when "thumb-print" hard.

- E. Flush cut all joints not tooled.
- F. When pointing, rake mortar joints to a depth of not less than 1/2 inch. Fill solidly with pointing mortar. Tool joints.

3.7 FLASHING

- A. Clean from masonry surface any projections that might puncture flashing.
- B. Place through-wall flashing on a bed of mortar. Cover flashing with mortar.
- C. Lap flashing a minimum of 6 inches.
- D. Leave flashing project from the face of the wall approximately 1/4 inch to form a drip. Flashing shall be cut back to the face of the wall after inspection if the drip is deemed objectionable by the Architect.

3.8 WEEPHOLES

- A. Provide weepholes in head joints of the first brick course immediately above flashing by placing weeps no more than 24 inches on the center horizontally.
- B. Keep the cavity free from mortar droppings.

3.9 EXPANSION JOINTS

- A. Keep clean from all mortar and debris. Locate as shown on drawings. Install neoprene pre-molded foam pad, backer rod, and sealant. Prime surfaces if necessary.

3.10 CLEANING

- A. Cut out all defective mortar joints and holes in exposed masonry and provide new mortar.
- B. Clean pre-selected sample wall area. Do not proceed with cleaning until approved by Architect.
- C. Clean brick as outlined in BIA Technical Note 20.
- D. All cleaning practices and products used shall follow the cleaning products manufacturer's printed instructions.
- E. For waxed thin brick, clean with 130 degrees F water using clean water and a low-pressure washer.

END OF SECTION

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 Floor Railings.
 - 2. 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 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 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 7-10 - 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 1 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: Galviline 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 18 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. Provide 5/8 inch by 2 inch diameter steel spacer at each support. 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

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 06 10 00 – ROUGH CARPENTRY

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Framing with dimension lumber.
 - 2. Framing with engineered wood products.
 - 3. Rooftop equipment bases and support curbs.
 - 4. Wood blocking, cants, and nailers.
 - 5. Wood furring and grounds.
 - 6. Wood sleepers.
 - 7. Plywood backing panels.

1.2 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.
 - 1. Include data for wood-preservative and fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee Board of Review.
- C. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
 - 1. Wood-preservative-treated wood.
 - 2. Fire-retardant-treated wood.
 - 3. Engineered wood products.
 - 4. Power-driven fasteners.
 - 5. Powder-actuated fasteners.
 - 6. Expansion anchors.
 - 7. Metal framing anchors.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber indicated to receive a stained or natural finish, provide certificates of grade compliance issued by grading agency.
 - 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
 - 1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPAC2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPAC31 with inorganic boron (SBX).
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Comply with performance requirements in AWPAC20 (lumber) and AWPAC27 (plywood).
 1. Use Exterior type for exterior locations and where indicated.
 2. Use Interior Type A, High Temperature (HT) for enclosed roof framing, framing in attic spaces, and where indicated.
 3. Use Interior Type A, unless otherwise indicated.
- B. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Application: Treat items indicated on Drawings, and the following:
 1. Framing for raised platforms.
 2. Concealed blocking.
 3. Framing for non-load-bearing partitions.
 4. Framing for non-load-bearing exterior walls.
 5. Roof construction.
 6. Plywood backing panels.

2.4 DIMENSION LUMBER FRAMING

- A. Maximum Moisture Content: 19 percent.
- B. Non-Load-Bearing Interior Partitions: Douglas Fir No. 2 or better.
- C. Framing Other Than Non-Load-Bearing Interior Partitions: Douglas Fir No. 1.
- D. Exposed Framing Indicated to Receive a Stained or Natural Finish: Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.
 1. Species and Grade: Douglas fir-larch; Select Structural WCLIB, or WWP.

2.5 ENGINEERED WOOD PRODUCTS

- A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi for 12-inch nominal depth members.
 2. Modulus of Elasticity, Edgewise: 2,000,000 psi (13 700 MPa).

B. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with laminated veneer lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Provide units—complying with material requirements of and with structural capacities established and monitored according to ASTM D 5055.

1. Provide I-joists manufactured without urea formaldehyde.
2. Web Material: Oriented strand board, complying with DOC PS 2, Exposure 1.
3. Structural Properties: Provide units with depths and design values not less than those indicated.
4. Provide units complying with APA PRI-400, factory marked with APA trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA standard.

C. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research/evaluation report for I-joists.

1. Material: Product made from laminated veneer lumber. Provide rim boards made without urea formaldehyde.
2. Thickness: 1-1/2 inch or 1-3/4 inch.
3. Provide performance-rated product complying with APA PRR-401, factory marked with APA trademark indicating thickness, grade, and compliance with APA standard.

2.6 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
 2. Nailers.
 3. Rooftop equipment bases and support curbs.
 4. Cants.

- 5. Furring.
- 6. Grounds.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content

2.7 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exterior, C-C Plugged fire-retardant treated as required, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.8 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.
- B. Power-Driven Fasteners: NES NER-272.
- C. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.9 METAL FRAMING ANCHORS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated on Drawings or comparable products by one of the following:
 - 1. Harlen Metal Products, Inc.
 - 2. KC Metals Products, Inc.
 - 3. Simpson Strong-Tie Co., Inc.
 - 4. USP Structural Connectors.
- D. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be

determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

- E. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.

2.10 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Flexible Flashing: Self-adhesive, rubberized-asphalt compound, bonded to a high-density, polyethylene film to produce an overall thickness of not less than 0.025 inch.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Where wood-preserved-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- E. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions and ICC ESR reports.
- F. Do not splice structural members between supports, unless otherwise indicated.
- G. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated on DSA approved drawings and complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in ICBO's Uniform Building Code.

4. Table 602.3(1), "Fastener Schedule for Structural Members," and Table 602.3(2), "Alternate Attachments," in ICC's International One- and Two-Family Dwelling Code.

3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 06 41 16 - CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Fabricated base cabinet units.
 - 2. Fabricated wall units.
 - 3. Fabricated countertops.
- B. Related Sections
 - 1. Section 01 35 42, CALGreen Requirements.
 - 2. Section 06 61 16 Solid Polymer Fabrications.

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. CBC - 2022 California Building Code
 - 1. CBC Chapter 11B, Accessibility to Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing
 - 2. CBC Chapter 16A, Structural Requirements
- D. California Green Building Standards Code, CALGreen - 2022.
- E. ASCE/SEI 7-10 - American Society of Civil Engineers, Structural Engineers Institute, ASCE Standard.
- F. NEMA LD 3 - High Pressure Decorative Laminates: National Electrical Manufacturers Association, 2005 Edition.
- G. DOC PS 20 - American Softwood Lumber Standard.
- H. DOC PS 1-07 - Department of Commerce Product Standard, U.S. Product Standard for Construction and Industrial Plywood.
- I. WI - Woodwork Institute, Architectural Woodwork Standards (NAAWS), Latest Edition.
- J. ANSI A208.1 - Particleboard.
- K. ANSI A208.2 Medium-Density Fiberboard-2009.
- L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

- M. California Title 17 Division 3 Subchapter 7.5 Air Bourne Toxic Control Measures, Section 93120.1 through 93120.12.
- N. SCAQMD - South Coast Air Quality Management District Regulations Rule 1168 Adhesive and Sealant Applications

1.3 SUBMITTALS

- A. Action/Informational
 - 1. Shop drawings including materials, component profiles, fastening methods, assembly methods, joint details, accessory listings and schedule of finishes.
 - 2. Product data.
 - 3. Hardware sample boards identified with the project name, cabinet manufacturer's name and address and one item of each type of hardware specified for installation, on panel of specified color and finish.
 - a. Additional Finish Samples: If multiple colors and finishes are specified, submit samples of additional colors and finishes on manufacturer's standard sample size, but not less than 5 by 7 inches.
- B. Record
 - 1. Statement of qualification from fabricator.
 - 2. WI Certifications.
- C. Closeout
 - 1. Record Documentation
- D. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code per 1.04.L.

1.4 QUALITY ASSURANCE

- A. Cabinets and countertops shall be manufactured in accordance with Sections 10, 11 and Supplements of the latest edition of the Architectural Woodwork Standards of the Woodwork Institute for Grade specified herein or to higher standards as specified herein.
- B. Fabricator Qualifications: A firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. Company specializing in manufacturing the products specified in this section with minimum five years documented experience. Cabinet manufacturer shall be a WI Licensed Fabricator and active member of the Woodwork Institute.
 - 1. Installer shall be WI Certified.

- C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production and installation of interior architectural woodwork with sequence-matched wood veneers including wood doors where veneer matching includes door faces.
- D. Before delivery to the jobsite, the casework supplier shall submit a WI Certified Compliance Certificate (Certified Compliance Program) indicating the products furnished for this job, and certifying that they will fully meet all the requirements of the grade or grades specified.
- E. Each elevation of casework and countertop shall bear a Certified Compliance Label.
- F. First page of shop drawings shall bear the WI Certified Compliance Label. Shop drawings not conforming to this requirement will be rejected.
- G. Statement shall appear prominently on the shop drawings certifying that all casework construction complies to the structural requirements of to ASCE 7-10, Section 13.5 Table 13.5-1 for required horizontal force factor for anchorage of non-structural components.
- H. One (1) copy of the latest issue of the WI NAAWS shall be made available for reference at the jobsite throughout the installation period.
- I. Inspections by Authorized WI inspectors shall be made in accordance with the following schedule:
 - 1. Shop inspection at place of manufacturer, prior to initial shipment of cabinet components to site.
 - 2. Site inspection immediately following installation of first cabinet components.
 - 3. Site inspection immediately following final installation of all cabinet Work.
 - 4. Additional site inspections may be required at the option of the Architect and at no cost to the Owner when certified WI inspection reports indicate unsatisfactory conformance with specified requirements.
 - 5. Provide full written reports to Architect.
- J. Written confirmation of all WI inspections shall be submitted, including a WI Certified Compliance Certificate for installation.
- K. WI Certification costs shall be included.
- L. 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.

- M. Pre-installation Conference
 - 1. Convene two weeks prior to commencing work of this section.
- N. Forest Certification: For new wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001
- O. Mock-up
 - 1. Provide full size base cabinet with countertop and upper cabinet of each casework type indicated, in specified finish with hardware installed. Include pairs of doors for both base and upper cabinet and at least one drawer.
 - 2. Units will establish a minimum standards of quality for this Work.
 - 3. Approved units may be used as part of the Work.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials only when the project is ready for installation and a clean storage has been provided in accordance with the WI Manual of Millwork.

1.6 FIELD MEASUREMENTS

- A. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
 - 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 COORDINATION

- A. Coordinate the work with electrical rough-in and floor finish sections.
- B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and will maintaining temperature between 60 and 90 deg F and relative humidity between 17 and 50 percent during the remainder of the construction period as recommended by NAAWS for the location of the project.

1.9 WARRANTY

- A. The manufacture shall warrant products from delamination, loose edges, defective or broken hardware, broken casters, loose wood trim, and horizontal or vertical members coming apart from each other and in general against defects in materials and workmanship for 5 years after Substantial Completion.
- B. The manufacturer further agrees after delivery date, to repair or replace without charge any woodwork that is defective within the meaning of this warranty. The manufacturer agrees to pay charges for finishing or installing replaced woodwork. This Warranty is not effective if goods are repaired or replaced without first obtaining the manufacturer's written consent.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Products of the following laminate materials manufacturers form the basis for design and quality intended.
 - 1. Wilsonart International, Temple, TX.
 - 2. Formica Corporation, Cincinnati, OH
 - 3. ABET Inc., Inglewood, NJ.
 - 4. Nevamar Corporation, Odenton, MD.
 - 5. Arborite, Quebec, Canada.
 - 6. Pionite Decorative Laminates, Maumee, IL.
 - 7. Lamin-Art, Elk Grove Village, IL.
 - 8. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.

2.2 GRADES

- A. Provide plastic covered casework in accordance with WI NAAWS, Section 10 for Custom Grade. ASTM E84, Class B, Flame Spread: Less than 75, Smoke Developed: less than 100.
- B. Construction Style: Style A frameless.
- C. Construction Type: Type I multiple self-supporting units rigidly joined together.
- D. Door and Drawer Front Style: Flush overlay.

2.3 CASEWORK UNITS

- A. Casework indicated on drawings shall conform to model Series described below:
 - 1. Base Cabinets: 100 Series.
 - 2. Drawer Base Cabinets: 200 Series.

- a. File drawers with built-in steel rail system for hanging folders.
3. Wall Hung Cabinets: 300 Series.

2.4 LAMINATE MATERIALS

- A. Plastic Laminate Cabinet Surfaces: NEMA LD 3, ASTM E84, Class B, Decorative High Pressure Laminate, General Purpose type, 0.028 inch thick at vertical surfaces (VGS), 0.050 inch thick at horizontal surfaces (HGS) and 0.042 inch thick (HGP) for post-formed work. Colors as selected, in wood grains, patterns or solids. Conform to Section 10, WI NAAWS.
- B. Plastic Laminate Countertops: NEMA LD 3, ASTM E84, Class B, Decorative High Pressure Laminate, General Purpose type, 0.042 inch thick (HGP) when post-formed, 0.050 inch thick (HGS) when flat. Colors as selected in wood grains, patterns or solids. Conform to Section 11, WI NAAWS.
- C. Laminate Backing Sheet: NEMA LD 3, High-pressure decorative laminate, BKV Backing Grade, non-decorated high-pressure plastic laminate, with face material of 0.028 inch.
- D. Cabinet Liner CLS for cabinet interiors: NEMA LD 3, CLS grade 0.020 inch thick, high pressure decorative laminate.
- E. Semi-exposed Areas of Cabinets: High-pressure laminate Cabinet Liner CLS except as specified herein.
 1. Apply Decorative High Pressure Laminate, General Purpose, to all surfaces visible from a seated or standing position, including interior surfaces of open casework, shelving, and casework with glass doors, to sloped tops and to tops up to 72 inches above floor or visible from an upper level.
 2. Apply Decorative High Pressure Laminate, General Purpose, to shelving, horizontal surfaces and all surfaces behind markerboards .
- F. Refer to Drawings for finishes.
 1. Multiple plastic laminate colors at various horizontal and vertical surfaces as selected by Architect.

2.5 SOLID POLYMER COUNTERTOPS

- A. Per Section 06 61 16 Solid Polymer Fabrications.

2.6 WOOD MATERIALS

- A. Softwood Lumber: PS 20; Graded in accordance with WI Custom Grade, Douglas Fir, Hemlock, Ponderosa Pine or Sugar Pine.

2.7 CORE MATERIALS

- A. Core, the following:
 1. Medium Density Fiberboard: ANSI A208.2,

- a. Grade 155 MR30: Medite II, no formaldehyde added, 100 percent pre-consumer recycled wood. Title 17 CCR by SierraPine.

2.8 ACCESSORIES

- A. Contact Adhesives: In accordance with Woodwork Institute for Type II rating, NAAWS, and specifically approved by WI for the area in which the Project is located. Wilsonart WA H20, water-based contact adhesive, or equal.
 1. Adhesives applied on-site shall comply with VOC content limits defined by SCAQMD Rule 1168.
- B. Fasteners: Size and type to suit application.
- C. Bolts, Nuts, Washers, Lags, Pins and Screws: Of size and type to suit application.
- D. Support angle brackets for countertops: 18" brackets, steel angle 1/4" thick, 2" legs, mitered and welded, ground smooth, unless noted otherwise on drawings, install at 16" on center. Finish: baked enamel, off white.
- E. Doorstop Blocks: Nylon type, 1 inch x 1 inch x 2 inches long.
- F. Cable Grommets: Molded-plastic grommets 3 inch diameter and matching plastic caps with slot for wire passage, Hafele 429.99, color: black.
- G. Edge Banding: High Pressure Plastic Laminate, Custom Grade at countertop edges and at cabinet door. Color to match cabinet faces.
- H. Edge Banding for drawer and shelf edges: Custom Grade PVC 3 mm edge banding; at drawers of width to match component thickness, straight edge (no radius). Color as selected by Architect.
- I. Wire Management: Mockett WM22A; Description: J-Shape, wire manager with flange fastened under a desk/work surface to route cables. Size: 4-5/16" H x 1-3/32" D x 2-9/16" high trough. Color: Matte black.

2.9 HARDWARE

- A. Conform to WI Architectural Woodwork Standards (NAAWS) and CBC Sections 11B-309 and 11B-225. Any hardware listed therein may be installed, except where those standards are exceeded as described below: "or equals" as substitutions may be submitted in accordance with Division 01 General Requirements.
 1. Shelf Support System: Provide KV 346 metal shelf support clips, with Phillips PHWS at each clip.
 2. Drawer and Door Pulls: Futuba 33202-102, Trimco, or equal, 4" center to center, loop handle, US26D finish.
 3. Hinges: RPC 850 series, heavy duty wrap around, hospital tips, 2-3/4" height minimum, width configuration as required for applicable. Color as selected by Architect.
 4. Magnetic Cath: EPCO #592

- a. Provide magnetic catches at all cabinet doors.
- 5. Elbow Catch: EPCO #1018
- 6. Slide Bolt: Trimco #4876
- 7. Door Lock (Hinged): National #8173 – Provided at all doors.
- 8. Drawer Lock: National #C8179 – Provided at all drawers.
- a. Keying: Key to Owner's standard keyware. Master key as directed by Owner. All rooms separately keyed alike.
- 9. Drawer Guides (Less than 24"): K.V. #8505
- 10. Drawer Guides (Less than 24"): K.V. #8505
- 11. Bottom/File Drawer: K.V. #8805
- 12. Coat Hooks: wall mounted, single; Ives IV581AM. Double: Ives IV582AM, Rockwood or equal. Mount at 44 inches maximum height AFF.
- 13. Pencil Slide: Accuride 2009, Black Zinc Finish.
- 14. Keyboard Slide: Accuride AC2008
- B. Finish: US-26D, Dull Chrome (Satin Chromium) plated , unless noted otherwise.

2.10 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting.
- C. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Make corners and joints hairline. Locate counter butt joints minimum 2 feet from sink cutouts. All patterns to run in the same direction.
- D. Install one door stop block screwed on the inside bottom of the inactive leaf to prevent the door from being pushed down to gain entry at all double doors base cabinets. Secure with 2 screws 1-1/2 long at each block.
- E. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Verify locations of cutouts from on-site dimensions. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs. Seal contact surfaces of cut edges.
- F. Provide access panels where required to access plumbing and associated casework utilities.
- G. Countertop Backsplash: Assembly 2-Deck Mount, unless otherwise noted on drawings. Backsplash tops: square with scribe.

- H. High Pressure Plastic Laminate Countertop Edges:
 - 1. Square edge: Self-edge Laminate shall be applied first with top laminate extending over the edge laminate in same method as Custom Grade. Eased exposed edges. Adhere with hot-melt adhesive.
- I. Edge Banding: High Pressure Laminate with hot melt adhesive applied, prime before application of adhesive, at cabinet doors, drawers, shelves.
- J. Edge Banding: Custom Grade PVC 3 mm at drawer and shelf edges.
- K. Shelf Loading: 50 lbs. per square foot or 50 lbs. per cubic foot of total volume of cabinet whichever is less. In no case shall unsupported shelf exceed 36" wide without mid support. Conform to Table 1607A.1, California Building Code.
- L. Shelf Thickness: 1 inch. All shelf surfaces and edges shall be finished with PVC 3 mm edge for Schools with premium adhesive.
- M. Install one grommet per workstation or at every 48 inches of work counter.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify adequacy of backing and support framing.
- B. 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 INSTALLATION

- A. Set and secure casework in strict accordance with the WI NAAWS.
- B. Set shelves on specified clips, secure with wood screws each clip, front only. Confirm shelves spacing with Owner, do not proceed without Owner's approval.
- C. Casework shall be anchored to walls or floors or both. Conform to ASCE 7-10, Section 13.5 Table 13.5-1 anchorage requirements.
- D. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c.
 - 2. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

3.3 ADJUSTING AND CLEANING

- A. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.
- B. Clean casework, counters, shelves, hardware, fittings and fixtures.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 07 01 00 ROOF REPAIRS

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. Section Includes:
 - 1. Roof repair work instructions.

1.3 DEFINITIONS

- A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
- C. Flashings and Fastening: Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
 - 1. NRCA Roofing and Waterproofing Manual (Fifth Edition) for construction details and recommendations.
 - 2. SMACNA Architectural Sheet Metal Manual (Fifth Edition) for construction details.

1.5 ACTION SUBMITTALS

- A. Product Data and MSDS Sheets: For each type of product specified.

1. Highlight characteristics that confirm compliance with specified products.

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Product Certificate: Submit letter, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
- B. Qualification Data: For Installer and Roofing Inspector. Include letter from Manufacturer written for this Project indicating approval. Indicate Installer's qualifications to maintain existing roof system Manufacturer's warranty.
- C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 1. Submit evidence of compliance with performance requirements.
 2. Indicate that proposed system components are compatible.
- D. Warranties: Sample of special warranties.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For built-up roofing to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years experience installing similar work.
- B. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified repair system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project.
- C. Source Limitations: Obtain roofing system components from or approved in writing by roofing system manufacturer.
- D. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.
 1. Meet with Owner, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Review structural loading limitations of roof deck during and after roofing.
 5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 6. Review governing regulations and requirements for insurance and certificates if applicable.
 7. Review temporary protection requirements for roofing system during and after installation.
 8. Review roof observation and repair procedures after roofing installation.
- E. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with Owner, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Review structural loading limitations of roof deck during and after roofing.
 5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 6. Review governing regulations and requirements for insurance and certificates if applicable.
 7. Review temporary protection requirements for roofing system during and after installation.
 8. Review roof observation and repair procedures after roofing installation.



1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.10 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Field measurements and material quantities:
 - 1. Contractor shall have sole responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.
- C. Waste Disposal:
 - 1. Do not re-use, re-cycle or dispose of material manufacturers product containers except in accordance with all applicable regulations. The user of manufactured products is responsible for proper use and disposal of product containers.
- D. Safety requirements:
 - 1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
 - 2. Comply with federal, state, local and Owner fire and safety requirements.

3. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
4. Maintain fire extinguisher within easy access whenever power tools, roofing kettles, fuels, solvents, torches, and open flames are being used.

1.11 WARRANTY

- A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Project Warranty: Submit Roofing Contractor's warranty, signed by Contractor, covering Work of this Section for the following warranty period:
 1. Warranty Period: 1 year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Basis of design & district standard: Tremco Inc.
- B. Manufacturers: Subject to compliance with requirements, provide products by a manufacturer meeting qualification requirement in Quality Assurance Article.
- C. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 ROOFING MEMBRANE SHEETS

- A. Roof Patch Back Base Sheet:
 1. ASTM D 6163, Type III, Grade S and CSA A123.23, Type A, Grade3
 - a. POWERply Endure 200 Smooth
- B. Roofing Patch Back SBS Modified Bituminous Cap Sheet:
 1. ASTM D 6163, Grade G, Type III, and CSA A123.23, Type A, Grade 1.
 - a. POWERply Endure 200 FR

- C. Roofing Patch Back Material Adhesive: Two-part urethane, 100% solids, bio-based, asbestos free, cold applied roof membrane adhesive.
1. POWERply Endure Bio Adhesive TF.
 2. Volatile Organic compounds (VOC), maximum, ASTM D 3960: 0 g/L.
 3. Density, minimum, ASTM D 1475: 11.1 lbs/gal (1.3 kg/L).
 4. Bio Based Content: 71% min.
 5. Indentation Hardness 25 Shore A.
 6. Volume Solids: 100%.
 7. Weight Solids: 100%.
 8. Elongation 150%.
- D. Seam Sealer Mastic: Waterproof seam and patching material compatible with applied coating.
1. Elastomeric Seam Sealer: White, single-component high solids moisture curing aliphatic polyurethane sealant, low-VOC, formulated for compatibility and use with specified roofing substrates.
 - a. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 75 g/L.
 - b. Tensile Strength, ASTM D412: 270 psi (1861 kPa).
 - c. Tear Strength, ASTM D412: 35 pli.
 - d. Elongation, ASTM D412: 700 percent.
 2. Acrylic Patching and Seam Sealer: White, single-component high solids acrylic sealant, low-VOC, formulated for compatibility and use with specified roofing and wall substrates.
 - a. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 50 g/L.
 - b. Tensile Strength, ASTM D412: 500 psi.
 - c. Hardness, Shore A: 45.
 - d. Elongation, ASTM D412: 315 percent.
 - e. Impact Resistance: >160 in/lb (18 kN/m).

A

E. Reinforcing Fabric:

1. Polyester Reinforcing and Protection Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings and as a protection layer under pavers or stone aggregates.
 - a. Permafab
 - b. Tensile Strength, Minimum, ASTM D1682: 50 lbf (23 kg) avg..
 - c. Elongation, Minimum, ASTM D1682: 60 percent.
 - d. Tear Strength, Minimum, ASTM D1117: 16 lbf (7.3 kg) avg..
 - e. Weight: 3 oz./sq. yd (102 g/sq. m).

F. Metal Coating: ASTM D 6083, solar-reflective acrylic elastomer emulsion coating.

G. Joint Sealant: Elastomeric joint sealant compatible with applied coating, with movement capability appropriate for application.

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

H. Fasteners: Factory-coated steel fasteners and metal or meeting corrosion-resistance provisions in FM 4470; designed for fastening roofing membrane components to substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer.

2.3 FLASHING MATERIALS

A. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.

B. Water-Based Asphalt Primer: Water-based, polymer modified, asphalt primer with the following physical properties:

C. Fluid Applied Flashing System: ASTM D 7311, elastomeric, two-coat, two-component, liquid urethane flashing system:

1. AlphaGuard Bio Base and Top Coat
2. Reinforcement: Permafab Reinforcing Fabric.

- D. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.
- E. Acrylic Roofing Mastic: Elastomeric acrylic-based compound providing a highly flexible seal.
 - 1. Asbestos Content, EPA/600/R-93/116: None.
 - 2. Tensile strength, ASTM D 2370: 148 psi.
 - 3. Elongation, ASTM D 2370: 430%.
- F. Butyl Tape: manufacturer's term bar sealant.
- G. Metal Seam Tape: Polyester fabric laminated to a modified butyl rubber adhesive.
- H. Urethane sealant: manufacturer's gun grade, moisture cured, one component polyurethane sealant.
 - 1. Hardness (Shore A), ASTM C 920-02: 40.
 - 2. Bond Durability, ASTM C 920-02: Pass.
 - 3. Stain and Color Change, ASTM C 920-02: None.
 - 4. Accelerated Weathering, ASTM C 920-02: Pass.
 - 5. VOC, ASTM D 3960-02: 85 g/L.
- I. Urethane Sealant Primer: One part, resin-based primer formulated to prepare concrete and masonry surfaces for the application of urethane sealants, with the following physical properties:
 - 1. Non-Volatile Content, minimum, ASTM D 2369: 30 percent.
 - 2. Flash Point, minimum, ASTM D 93: 80 deg. F (27 deg. C).
 - 3. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 670 g/L.
 - 4. Density at 77 deg. F (25 deg. C), minimum, ASTM D 1875: 8.25 lb/gal (988 g/L).

A

2.4 ADHESIVE MATERIALS

- A. General: Adhesive and sealant materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Low Odor Adhesive: Two part urethane, 100% solids, bio-based cold applied membrane adhesive.
 - 1. POWERply Endure Bio Adhesive TF.
 - 2. Volatile Organic compounds (VOC), maximum, ASTM D 3960: 0 g/L.
 - 3. Density, minimum, ASTM D 1475: 11.1 lbs/gal (1.3 kg/L).
 - 4. Bio Based Content: 71% min.
 - 5. Indentation Hardness 25 Shore A.
 - 6. Volume Solids: 100%.
 - 7. Weight Solids: 100%.
 - 8. Elongation 150%.

2.5 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.
- B. Fasteners: Factory-coated steel fasteners and metal plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
- C. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.6 METAL FLASHINGS

- A. Termination bar:

1. Aluminum bar:
 - a. 1/8 x 1 inch (3.2 x 25.4 mm).
- B. Counterflashing and counterflashing extensions:
 1. General: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces and compatible with flashing indicated.
 2. Galvanized Steel Sheet: ASTM A526, G90, commercial quality, or ASTM A527, G90, lock-forming quality, hot-dip galvanized steel sheet with 0.20 percent copper.
 - a. Galvanized Steel Sheet: 24 gage (0.0276 inch) (0.7010 mm).
 3. Masonry Type: Provide with offset top flange for embedment in masonry mortar joints.
 4. Counterflashing Wind-Restraint Clips: Provide hold down clips with 1/2 inch (12.7 mm) kickout to be installed before counterflashing to prevent wind uplift on the counterflashing lower edge. Fabricate the clips of the following materials:
 - a. Galvanized Steel: 22 gage; 0.0336 inch (0.8534 mm) thick.
- C. Work shall be in accordance with Architectural Sheet Metal Manual, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

2.7 MECHANICAL FASTENERS

- A. Wood to wood:
 1. Galvanized, common, annular ring nail.
 2. Length: Sufficient to penetrate underlay blocking 1-1/4 inches (32 mm).
- B. Galvanized sheet steel to wood blocking:
 1. FS FF-N-105B(3) Type II, Style 20, roofing nails; galvanized steel wire, flat head, diamond point, round, barbed shank.
 2. Length: Sufficient to penetrate wood blocking 1-1/4 inches (32 mm) minimum.
- C. Galvanized sheet steel to galvanized sheet metal. (Counterflashing extensions)

1. Self-tapping sheet metal screws of 1/2 inch length and a minimum #3 diameter, with 5/8" steel/EPDM washer under head.

D. Drawband:

1. Gold Seal stainless steel worm gear clamp by Murray Corporation, Cockeysville, MD.
2. Power-Seal stainless steel worm drive clamps by Breeze Clamp Company, Saltsburg, PA.

2.8 COATING MATERIALS

- A. Aluminum Roof Coating: Water-based aluminum asphalt emulsion coating that forms a reflective shield over asphalt roofing systems and is formulated to meet all VOC regulations.
- B. Metal Primer: Water based acrylic metal primer that provides a tough, flexible film for the protection of steel against corrosion. Must be VOC compliant.
- C. Metal Coating: Durable elastomeric acrylic resin weatherproofing coating that will accommodate metal roof movement.

1. Density, minimum, ASTM D1475: 11.5 lb/gal.
2. Solids by weight, minimum, ASTM D 1353: 64%.
3. Elongation, ASTM 2370: 475%.
4. Tensile strength, minimum, ASTM D 2370: 190 psi.

2.9 RUBBER BLOCKS

- A. Rubber Blocks: 100% rubber blocks with steel channels and reflective strips designed for supporting conduit.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Remove and properly dispose of all roof debris, customer identified equipment, existing wood sleepers, failed base flashing, drain bolts, and failed repairs.
- B. Substrate inspection:

1. The Applicator shall inspect the substrate for defects such as excessive surface roughness, contamination, structural inadequacy, or any other condition that will adversely affect the quality of work.
2. The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Test roof drains for leaks. Notify District in writing if there are any drain plumbing leaks.
- C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- D. Protection:
 1. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to Owner.
 2. Roofing, flashings, membrane repairs, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.
 3. At start of each work day drains within daily work area shall be plugged. Plugs to be removed at end of each work day or before arrival of inclement weather.
 4. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day and before arrival of inclement weather.
 5. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.
 6. Protect building surfaces at set-up areas with tarpaulin. Secure tarpaulin. Spilled or scattered debris shall be cleaned up immediately. Removed material to be disposed from roof as it accumulates.



7. At end of each working day, seal removal areas with water stops along edges to prevent water entry.
8. Provide clean plywood walkways and take other precautions required to prevent tracking of aggregate/debris from existing membrane into new work area where aggregate/debris pieces can be trapped within new roofing membrane. Contractor shall instruct and police workmen to ensure that aggregate/debris is not tracked into new work areas on workmen's shoes or equipment wheels. Discovery of entrapped aggregate/debris within new membrane is sufficient cause for its rejection.

3.3 INSTALLATION, GENERAL

- A. Install roofing repairs in accordance with manufacturer's recommendations. Have specification and product data sheets on the job site.
- B. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing material.
- C. Details not addressed in specification shall be in accordance with NRCA Manual Plates and recommendations, and the Architectural Sheet Metal Manual, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

3.4 NEW PENETRATIONS AND FLASHINGS

- A. New curb flashing:
 1. As needed install new plywood and supports to create substrate necessary for proper flashing.
 2. Install insulation and wood nailers as needed to provide a proper flashing substrate acceptable to the manufacturer.
 3. Fully adhere base sheet to new curb in base sheet adhesive. Wrap the base sheet around the corners of the curb.
 4. Install fully reinforced liquid urethane flashing system and tie into the existing liquid urethane roof a minimum of 8 inches in all directions.
 5. Prime existing roof with manufacturer's recommended primer prior to application of the new liquid urethane
- B. New penetrations:
 1. Install liquid urethane flashing system according to manufacturer's requirements and details.

3.5 ROOF REPAIRS WHERE EXISTING PENETRATIONS ARE REMOVED

- A. Inspect new decking to ensure it is tightly secured with no loose areas or sharp projections.
 - 1. Remove all debris from repair area and prime existing roof system 12 inches in all directions surrounding the repair area.
- B. Install manufacturer recommended base and ply sheets to match existing roof system thickness. Extend base sheet and ply sheets a minimum of 12 inches onto existing roof system in all directions.
 - 1. Install one base sheet to substrate.
 - 2. Install a minimum of two (2) ply sheets. Install additional ply sheets as needed to match existing roof system thickness.
 - 3. Install surfacing matching existing system type.
 - a. Cap sheet surfacing: Fully adhere new cap sheet surfacing to entire repair area and extend over installed ply sheets.
 - 4. Install fully reinforced liquid urethane system over entire repair area and extend onto existing roof system 12 inches in all directions.
 - 5. Prime existing urethane roof system with manufacturer's recommended primer prior to application of the flashing system.
 - 6. coating.



3.6 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Owner.
- B. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.7 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

A

THIS PAGE INTENTIONALLY LEFT BLANK

A

SECTION 07 01 50.76 – FOAM ROOF REPAIRS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Roof repair preparation including foamed roof partial removal and patching, scarification, and cleaning preparation for repairs.
 - 2. Rehabilitation or replacement of base flashings.
 - 3. Application of coating on foamed roofing.
- B. Allowances: Refer to Division 01 Section "Allowances" for description of Work in this Section affected by allowances.

1.2 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 "Standard Terminology Relating to Roofing and Waterproofing" and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" for definition of terms related to roofing work in this Section.
- B. Existing Roofing System: Coated foamed roofing, and components and accessories.
- C. Patching: Removal of any portion of existing foamed roofing system & underlayment from deck or removal of selected components and accessories from existing foamed roofing & underlayment replacement with similar materials.
- D. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.
- E. Existing to Remain: Existing items of construction that are not indicated to be removed.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
- B. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.
 - 1. Letter written for this Project indicating manufacturer approval of Installer to apply specified products and provide specified warranty.

- C. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing rehabilitation system.
- D. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, and for dust control. Indicate proposed locations and construction of barriers.
- E. Inspection Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions required and carried out.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: To include in maintenance manuals.
- B. Warranties: Executed copies of approved warranty forms.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing products comparable to those specified, able to communicate verbally with Contractor, Architect, and employees, and the following:
 - 1. Qualified by the manufacturer to install manufacturer's product and furnish warranty of type specified.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years' experience in manufacture of specified products in successful use in similar applications.
- C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
 - 1. An authorized full-time technical employee of the manufacturer.
- D. Roofing Rehabilitation Preinstallation Conference: Conduct conference at Project site to review methods and procedures related to roofing system.
 - 1. Meet with Owner; roofing re-coating materials manufacturer's representative; roofing re-coating Installer including project manager and foreman; and installers whose work interfaces with or affects re-coating including installers of roof accessories and roof-mounted equipment requiring removal and replacement as part of the Work.
 - 2. Review methods and procedures related to repair preparation, including existing foamed roofing system manufacturer's written instructions.

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

1.7 FIELD CONDITIONS

- A. Existing Roofing System: Coated foamed roofing over rigid insulation.
- B. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations are not disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.
 1. Coordinate work activities daily with Owner so Owner can place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
 1. Remove only as much roofing in one day as can be made watertight in the same day.

1.8 WARRANTY

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

1. Form of Warranty: Form acceptable to Owner and Architect.
2. Scope of Warranty: Work of this Section.
3. Warranty Period: 2 years from date of completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Provide recoated foamed roofing and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
 1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
- D. Solar Reflectance Index: Solar reflectance index not less than 90 for not less than 75 percent of the roof surface, when calculated according to ASTM E 408 based on testing identical products by a qualified testing agency.
- E. Energy Performance: Roofing system shall have an initial solar reflectance index of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.
- F. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

2.2 MATERIALS, GENERAL

- A. General: Re-coating materials recommended by roofing system manufacturer for intended use and compatible with components of existing membrane roofing system.
- B. Temporary Roofing Materials: Selection of materials and design of temporary roofing is responsibility of Contractor.
- C. Infill Materials: Where required to replace test cores and to patch existing roofing, use infill materials matching existing membrane roofing system materials, unless otherwise indicated.
- D. Temporary Roof Drainage: Design and selection of materials for temporary roof drainage are responsibilities of the Contractor.

2.3 POLYURETHANE FOAM INFILL AND REPLACEMENT MATERIAL

- A. Polyurethane Foam: Rigid, cellular polyurethane, zero-ozone-depleting, designed for roofing applications; complying with ASTM C 1029, Type III; spray applied, with fire retardants as required, and acceptable to coating manufacturer.
1. Basis-of-Design Product; BASF Polyurethanes North America, www.polyurethanes.basf.us; Elastospray 81000 series, or a comparable product by one of the following:
 - a. Bayer MaterialScience LLC.
 - b. Gaco Western LLC.
 - c. Neogard; a division of Jones-Blair, Inc.
 2. In-Place Density: 2.8 to 3.0 lb/cu. ft. (44.9 to 48.1 kg/cu. m); ASTM D 1622.
 3. Compressive Strength: 45 psi, ASTM D 1621.
 4. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 75 or less.

2.4 COATING SYSTEM

- A. Silicone fluid-applied roof coating system: ASTM D6694 single component moisture curing low odor, formulated for use as a restoration coating.
1. Basis of design product: Tremco, AlphaGuard Si 100 .
 2. Combustion Characteristics, UL 790: Class A, for two-coat system applied over Class A roof.
 3. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 50 g/L.
 4. Tensile Strength, ASTM D412: 307 psi at 73 degrees fahrenheit.
 5. Elongation, ASTM D412: 205 percent at 73 percent.
 6. Tear Resistance, ASTM D624: 26 lbf per in at 73 degrees fahrenheit.
 7. Accelerated Weathering, 5000 hours, ASTM G154: Pass.
 8. Hardness, Shore A, minimum, ASTM D2240: 45.
 9. Permeance, ASTM E96 Method B: 9.3.
 10. Solids, by volume, ASTM D2697: 96 percent.
 11. Solar Reflectance Index (SRI), initial: 110, white .

12. Color: White.
 13. Base coat application, smooth surface: 1 gal per 100 s.f..
 14. Base coat application, over rough surface: 2 gal per 100 s.f..
 15. Top coat application: 1.5 gal per 100 s.f..
- B. Silicone fluid-applied roof coating system primer: two-component water-based thixotropic epoxy primer, formulated for use as a primer over metal, wood, masonry, bituminous surfaces, SPUF, and single ply membranes.
1. Basis of design product: Tremco, AlphaGuard Si Primer.
 2. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 55 g/L.
 3. Solids, by volume, minimum, ASTM D2697: 40 percent.
 4. *Application*.
 5. Primer application, smooth surface: 1 gal per 100 to 150 s.f..
 6. Primer application, over rough surface: 1 gal per 75 to 100 s.f..
 7. Primer application, over single ply membranes: 1 gal per 250 to 300 s.f..

2.5 AUXILIARY MATERIALS

- A. Primer, Urethane Foam: Polyurethane foam manufacturer's standard factory-formulated primers for scarified polyurethane and for prepared metals.
- B. Thermal Insulation Properties and Approved Insulation Boards.
1. Rigid Polyisocyanurate Roof Insulation; ASTM C1289:
 - a. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
 - b. Thickness: Minimum 1" (or match existing thickness)
 - c. R-Value: Minimum 5.6 per 1".
 - d. Compliances: UL, WH or FM listed under Roofing Systems Federal Specification HH-I-1972, Class 1.
 - e. Acceptable Manufactures
 - i) Hunter
 - ii) Atlas
 - iii) Substitutions per section 01 60 00 product requirements.
- C. Reinforcing Fabric:
1. Polyester Reinforcing and Protection Fabric: 100 percent stitch-bonded mildew-resistant polyester fabric intended for reinforcement of compatible fluid-applied membranes and flashings and as a protection layer under pavers or stone aggregates.

- a. Basis of design product: Tremco, Permafab.
 - b. Tensile Strength, Minimum, ASTM D1682: 50 lbf (23 kg) avg..
 - c. Elongation, Minimum, ASTM D1682: 60 percent.
 - d. Tear Strength, Minimum, ASTM D1117: 16 lbf (7.3 kg) avg..
 - e. Weight: 3 oz./sq. yd (102 g/sq. m).
- D. Polyethylene micro fiber additive: Tremco US, AlphaGuard Si Poly FIL.
- 1. Basis of design product: Tremco, AlphaGuard Si Poly FIL.
- E. Joint Sealant:
- 1. Joint Sealant, Silicone: ASTM C920 Type S, Grade NS, Class 25, Use NT, M, G, A, and O. Single-component low-modulus moisture curing self-leveling sealant, formulated for compatibility and use with specified substrates.
 - a. Basis of design product: Tremco, Tremseal S.
 - b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 0 g/L.
 - c. Tensile Strength at maximum elongation, ASTM D412: 200 psi (1379 kPa).
 - d. Tear Resistance, ASTM D624: 40 pli (7 kN/m).
 - e. Peel Strength onlisted substrates, ASTM C794: 30 pli (5 kN/m).
 - f. Hardness, Shore A, ASTM C661: 15.
 - g. Color: White.
- F. Sheet Flashing and Accessories: Types recommended by coated foamed roofing manufacturer, provided at locations indicated and as recommended by coated foamed roofing manufacturer.

2.6 WALKWAYS

- A. Slip-resistant Fluid Applied Walkway
- 1. Silicone fluid-applied roof coating system: ASTM D6694 single component moisture curing low odor, formulated for use as a restoration coating.
 - a. Basis of design product: Tremco, AlphaGuard Si 100 .
 - b. Combustion Characteristics, UL 790: Class A, for two-coat system applied over Class A roof.
 - c. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 50 g/L.
 - d. Tensile Strength, ASTM D412: 307 psi at 73 degrees farenheit.
 - e. Elongation, ASTM D412: 205 percent at 73 percent.
 - f. Tear Resistance, ASTM D624: 26 lbf per in at 73 degrees farenheit.
 - g. Accelerated Weathering, 5000 hours, ASTM G154: Pass.
 - h. Hardness, Shore A, minimum, ASTM D2240: 45.
 - i. Permeance, ASTM E96 Method B: 9.3.
 - j. Solids, by volume, ASTM D2697: 96 percent.
 - k. Solar Reflectance Index (SRI), initial: 110, white .
 - l. Color: Light Grey.
 - m. Base coat application, smooth surface: 1 gal per 100 s.f..
 - n. Base coat application, over rough surface: 2 gal per 100 s.f..
 - o. Top coat application: 1.5 gal per 100 s.f..

2. Aggregate, Slip Resistant Silica Sand: Silica sand, broadcast into fluid-applied roof coating products for use as aggregate fill for slip-resistant, abrasion-resistant coating applications.
 - a. Basis of design product: Aggregate, Slip Resistant Silica Sand.
 - b. Size: 20 - 40 mesh.
 - c. Application Rate: Minimum 20 lb/100 sq ft (1 k/m²).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine portions of existing coated foamed roofing indicated for rehabilitation.
- B. Verify that related work is complete. Do not install coated foamed roofing until new work or repair work to roof openings, curbs, and parapets, if any, are complete and roof drains, vents, and other roof penetrations are in place and properly prepared.
- C. Examine substrates, areas, and conditions under which coated foamed roofing and roof coatings will be applied, with Installer present, for compliance with requirements.
- D. Proceed with installation only after unsatisfactory conditions have been corrected and substrates are dry.
- E. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing work to be performed according to manufacturer's written instructions and warranty requirements.
 1. Apply materials within the range of ambient and substrate temperatures recommended by material manufacturers, but not below 50 deg F (10 deg C).
 2. Apply materials within range of relative humidity recommended by manufacturer of each component, but not when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F (3 deg C) above dew point.
 3. Do not apply materials to damp or wet surfaces.
 4. Do not apply primers, polyurethane foam, or coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period.
 5. Do not apply polyurethane foam when wind conditions result in surface finish textures not complying with requirements.
 6. Do not apply coatings when wind conditions prevent uniform coating application.

3.2 PREPARATION

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

1. Verify that rooftop utilities and service piping affected by the Work have been shut off before commencing Work.
- B. Roof Drains: Inspect and flush roof drains within roof system to be rehabilitated; verify roof drains are free flowing. Notify Owner of slow flowing or blocked roof drains.
 1. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
- C. Pollution Control: Comply with environmental regulations of authorities having jurisdiction. Limit spread of dust and debris.
 1. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 2. Remove debris from building roof by chute, hoist, or other device that will convey debris to grade
- D. Protect existing roofing system that is indicated not to be rehabilitated, and adjacent portions of building and building equipment.
 1. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
 2. Maintain temporary protection and leave in place until roofing rehabilitation has been completed.
- E. Protection during Work: Do not permit water to enter into or under existing roofing system components that are to remain.
- F. Cover and mask adjoining surfaces not receiving coated foamed roofing to prevent overspray or spillage affecting other construction. Temporarily close off roof drains, removing roof-drain plugs when not doing coated foamed roofing work or when rain is forecast.
 1. Remove masking after polyurethane foam application; cover and re-mask adjoining surfaces before coating polyurethane foam.
- G. Prime substrate as recommended by coated foamed roofing manufacturer.
- H. Fill, cover, or tape joints and cracks in substrate that exceed a width of 1/4 inch (6 mm). Remove dust and dirt from narrower joints and cracks before applying polyurethane foam.

3.3 ROOFING RE-COATING PREPARATION

- A. Foamed Roofing Surface Preparation and General Roof Repairs for Areas Indicated and at Irregularities, Failures, and Damaged Areas of the Existing Roofing:
 1. Remove and dispose of existing walkway system.

2. Remove loose granular aggregate from granular aggregate-surfaced foamed roofing using power broom in areas to be repaired.
3. Remove blisters, ridges, buckles, and other substrate irregularities from existing roofing that would inhibit application of uniform, waterproof coating.
4. Repair substrate at locations where irregularities have been removed.
5. In repair areas shave surface of sprayed polyurethane foam as necessary to achieve a sufficiently uniform plan to receive new roofing.
6. Remove wet or damaged foamed roofing material to clean, dry foam.
7. Build up isolated low spots on existing roofing with sprayed foam to prevent ponding.
8. Clean substrate of contaminants such as dirt, debris, oil, grease and other substances that may affect adhesion of coating with a high-pressure power wash at maximum 800 psi, using only clean water.
 - a. Where power washing with water does not remove contaminants, power wash with detergent solution and water.
 - b. Scour areas of accumulated dirt, fungus, mold, grease, oil, etc. with detergent solution and water. Do not use solvents.
 - c. In areas where a detergent solution has been used, rinse with clean water to remove residual detergent.
9. Prime scarified and repaired foamed roofing substrate using foam manufacturer's recommended primer.
10. Verify that existing substrate is dry before proceeding with work. Spot check substrates with an electrical capacitance moisture-detection meter.

3.4 FLASHING REPAIR

- A. Where indicated, remove existing base flashings to be replaced around parapets, curbs, walls, and penetrations.
 1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish.
- C. Install new counterflashing where indicated or required at new equipment.
- D. Repair flashings, gravel stops, copings, and other roof-related sheet metal and trim elements. Reseal joints, replace loose or missing fasteners, and replace components where required to leave in a watertight condition.

3.5 FLASHING AND STRIPPING INSTALLATION

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
 - 1. Prime substrates with recommended primer if required by roofing system manufacturer.
 - 2. Flashing Sheet Application: Install foam flashing per manufacturer's requirements at all new equipment locations, where repairs are required and at all locations indicated on drawings.
- B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 6 inches (150 mm) onto field of roofing membrane.

3.6 POLYURETHANE FOAM APPLICATION

- A. General: Mix and apply polyurethane foam according to ASTM D 5469 and coated foamed roofing manufacturer's written instructions.
 - 1. Install foam roofing in repair areas and at new penetration/equipment locations according to manufacturer's written instructions and standard details for work indicated.
 - 2. Fill irregularities and depressions to prevent ponding water.
 - 3. Apply the required full thickness of polyurethane foam in any specific area on same day.
 - 4. Apply only the area of polyurethane foam that can be covered with required base coating on same day or within 24 hours.
 - 5. Apply polyurethane foam to avoid overspray beyond immediate area of work.
- B. Apply polyurethane foam in lift thicknesses not less than 1/2 inch (13 mm) and not more than 1-1/2 inches (38 mm).
 - 1. Apply one inch thickness of foamed roof product over existing scarified foamed roofing and prepared flashings.
- C. Build-up isolated low spots on existing roofing with recoating manufacturer's recommended products to alleviate ponding.
- D. Uniformly apply total thickness of polyurethane foam indicated, but not less than 1 inch (25 mm), to a surface tolerance of plus 1/4 inch (6 mm) and no minus.
 - 1. Slope to Drain: Vary thickness uniformly and fill low spots to achieve minimum 1/4 inch per foot (1:48) slope to drain unless otherwise indicated.

- E. Apply polyurethane foam to roof penetrations, terminations, and vertical surfaces as indicated. Unless otherwise indicated, extend polyurethane foam at least 4 inches (100 mm) above elevation of adjacent roof field.
- F. Surface Finish: Provide finished surface of polyurethane foam within the following range of surface textures as defined by ASTM D 5469:
 - 1. Texture: Smooth to orange peel or coarse orange peel.
- G. Remove and replace polyurethane foam not complying with surface-texture limitations. Remove defective thickness and prepare and reapply polyurethane foam with acceptable, uniform results.

3.7 ROOF COATING APPLICATION

- A. Allow polyurethane foam substrate to cure for a minimum time recommended by coating manufacturer before coating. Apply base coat of coating system to polyurethane foam the same day as application of the foam.

Remove dust, dirt, water, and other contaminants before applying coating system. Allow base coat to cure minimum of 24 hours before applying top coat.
- B. Apply coating system to polyurethane foam by spray, roller, or other suitable application method according to coating manufacturer's written instructions.
- C. Prime foamed roofing, metal, and masonry substrates with coating system primer when recommended by coating system manufacture.
- D. Apply base coat and topcoat to obtain a uniform, seamless membrane free of blisters and pinholes.
 - 1. Application rate: Apply base coat and top coat to thicknesses indicated in Part 2 Product listing unless greater thickness is recommended by coating system manufacturer.
- E. Height at Terminations: Apply coating system at wall terminations and other vertical surfaces to extend vertically beyond polyurethane foam by a minimum of 4 inches (100 mm).
- F. Joint Sealant: Apply joint sealant to perimeter and other terminations and penetrations where indicated on Drawings or required in order to provide a complete weathertight installation.
 - 1. Tool v-groove 1/2 inch (12 mm) wide in foamed roofing at intersection of foamed roofing with perimeter edge metal and fill with joint sealant.

3.8 WALKWAY INSTALLATION

- A. Walkways: Install roof walkways in a continuous path from roof access points to and surrounding all serviceable equipment as follows:
 - 1. Slip-Resistant Walkway Topcoat: Apply walkway second topcoat following application and curing of top coat.

- a. Mask walkway location with tape.
- b. Prime first top coat prior to application of walkway top coat if walkway top coat is not applied within 72 hours of the first top coat application, using manufacturer's recommended primer.
- c. Apply walkway topcoat and back roll to achieve minimum coating thickness indicated on Part 2 product listing, unless greater thickness is recommended by manufacturer; verify thickness of base coat as work progresses.
- d. Broadcast Slip-Resistant Top Coat Aggregate in wet top coat at rate indicated in Part 2 product listing or as otherwise recommended by coating manufacturer.
 - 1) Back roll aggregate and top coat creating even dispersal of aggregate. Remove masking immediately.

3.9 FIELD QUALITY CONTROL

- A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.
- B. Roof Inspection: Contractor shall engage roofing system manufacturer's technical personnel to inspect roofing installation and submit report. Notify 48 hours in advance of dates and times of inspections. Inspect work as follows:
 1. Upon completion of preparation of first component of work, prior to application of re-coating materials.
 2. Following application of re-coating to flashings and application of base coat to field of roof.
 3. Upon completion of re-coating but prior to re-installation of other roofing components.
- C. Repair fluid-applied membrane where test inspections indicate that they do not comply with specified requirements.
- D. Arrange for additional inspections, at Contractor's expense, to verify compliance of replaced or additional work with specified requirements.

3.10 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove coating that does not comply with requirements, repair substrates, and reapply coating.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 07 21 00 – INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Thermal insulation in exterior roof and 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.
- B. Schedule:

1. Roof assembly – R-30 insulation



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.
- B. Schedule:
1. Restroom walls – R-19 sound insulation.
 2. Restroom ceilings – R-30 sound insulation.
 3. Office, testing rooms, and conference room walls - R-19 sound insulation.
 4. Studio room walls – R-19 sound insulation.
 5. Work room walls – R-19 sound insulation.

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

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 07 26 13 – WEATHER RESISTIVE, AIR BARRIERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Weather resistive/air barriers on exterior side of exterior wall sheathing.
- B. Related Section

- 1. Section 04 21 00, Clay Unit Masonry



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 E-96-90, Water Transmission of Materials.
- C. ASTM E-1677-95, Air Retarder (AR) Material or System for Low-Rise Framed Building Walls.
- D. AATCC-127, Flydrostatic Flead Test.

1.3 SUBMITTALS

- A. Copies of test results showing performance characteristics equaling or exceeding those specified.

1.4 QUALITY ASSURANCE

- A. Hold a pre-installation conference, two weeks prior to start of weather/air barrier installation. Attendees shall include Contractor, Architect, installer, Owner's representative, and air barrier manufacturer's designated representative.
- B. Schedule installation of air barrier materials and exterior cladding within nine months of air barrier assembly installation.

1.5 WARRANTY

- A. Special Warranty:
 - 1. Weather/air barrier manufacturer's warranty for a period of ten years from date of Substantial Completion.
 - 2. A site observation and approval by weather/air barrier manufacturer for warranty is required prior to assembly installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of following manufacturers form basis for design and quality intended.
 - 1. Du Pont Company, Wilmington, DE; Product: Tyvek CommercialWrap D-Style 1083.

2. Reemay Inc, Old Hickory, TN. Product: Typar Metro Wrap
 3. Fortiber Building Systems, Fernley, NV. Product: SuperJumboTex - as outbound layer only under plaster facades.
- B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.2 WATER RESISTANT BARRIER

- A. High Performance spunbonded olefin, non-woven, non-perforated. Surface texture to allow drainage of water; 2.4 ounces per square yard.
- B. Characteristics
1. Equivalent to Grade D paper with a 60 minute water-resistant rating, per Section CBC 2510.6.
 2. Nominal weight: 2.7 ounces per square yard.
 3. ASTM E1677 Type I Air Retarder. Air leakage at 25 miles per hour wind pressure of less than 0.6 cfm per ft².
 4. Water Vapor Transmission of greater than 20 perms in accordance with ASTM E-96, Method B.
 5. Water penetration resistance of 200 cm on hydrostatic head in accordance with AATCC-127.

2.3 SEALING TAPE/FASTENERS

- A. Approved Tape Manufacturers:
1. 3" DuPont Tyvek Tape, by DuPont Company, Wilmington, DE.
- B. Wood Frame Construction:
1. DuPont Tyvek Wrap Cap Nails: 1-5/8 inch rust resistant nail with 2-inch diameter plastic cap fasteners.
- C. 4-inch Dupont StraightFlash or 4-inch DuPont Flashing Tape to air barrier membrane prior to the installation cladding anchors, (i.e., z-girts, hat channels, brick ties).
- D. Provide sealants that comply with ASTM C 920, elastomeric polymer sealant to maintain watertight conditions.
- E. Adhesives:
1. Provide adhesive recommended by weather barrier manufacturer.

F. Primers:

1. Provide flashing manufacturer recommended primer to assist in adhesion between substrate and flashing.

G. Flashing:

1. DuPont Flexwrap: Flexible membrane flashing materials for window openings and penetrations.
2. DuPont Thru-Wall Surface Adhered Membrane with Integrated Drip Edge: Thru-Wall flashing membrane materials for flashing at changes in direction or elevation (shelf angles, foundations, etc.) and at transitions between different assembly materials.

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 weather resistive barrier.

3.2 INSTALLATION

- A. Install in accordance with Manufacturer's instruction over exterior sheathing. Seal joints and penetrations through weather resistive barrier with specified tape and fasteners prior to installation of finish material. Air infiltration barrier shall be airtight and free from holes, tears, and punctures. All window and door penetrations are to be flashed and sealed per manufacturer instructions.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 07 62 00 – SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Parapet Copings and Flashings.
 - 2. Roof flashings.
 - 3. Roof joint cover flashings.
 - 4. Equipment Roof Curbs and Flashing.
- B. 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. California Building Code 2022 Chapters 14 and 15.
- C. California Green Building Standards Code, CALGreen - 2022.
- D. American Society for Testing and Materials (ASTM)
 - 1. ASTM A480/A480M- General Requirements for Flat-Rolled Stainless Steel and Heat Resisting Steel Plate, Sheet, and Strip.
 - 2. ASTM A653/A653M-98 - Sheet Steel, Zinc-Coated (Galvanized) or Zinc - Iron Alloy Coated by the Hot-Dip Process
 - 3. ASTM B32 - Solder Metal
 - 4. ASTM D4601 - Asphalt-Coated Glass Fiber Base Sheet Used in Roofing
- E. National Roofing Contractors Association (NRCA)
 - 1. NRCA Manual - Fifth Edition.
- F. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)
 - 1. SMACNA Manual - Architectural Sheet Metal Manual, Current Edition

1.3 SUBMITTALS

- A. Shop drawings showing material profile, jointing pattern, jointing details, fastening methods and installation details.
- B. Product data.

- C. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code per 1.04.A.
- D. Manufacturer's installation instructions.
- E. Samples for each type of sheet metal flashing and trim indicated with pre-finished coating and colors.

1.4 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.

1.5 STORAGE AND HANDLING

- A. Stack preformed and pre-finished material to prevent twisting, bending, or abrasion and to provide ventilation.
- B. Prevent contact with materials during storage that may cause discoloration, staining or damage.

PART 2 - PRODUCTS

2.1 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653/A653M-02, G90.

2.2 ACCESSORIES

- A. Fasteners: round head, galvanized steel with soft neoprene washers at exposed fasteners. Finish exposed fasteners same as flashing metal.
- B. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- C. Self-Adhesive Flashing: 40 mils, nominal, thickness composite sheet, fabricated with 8-mil polyethylene film backing and 32-mil rubberized asphalt sheet waterproofing.
 - 1. Acceptable Products: as follows, or equal, approved in accordance with Division 01, General Requirements, for substitutions.
 - a. Perm-A-Barrier sheet by Grace Construction Products, Cambridge, MA
 - b. Carlisle Coatings and Waterproofing CCW-705T-WF
 - c. Henry Company, Blueskin-SA
 - d. FortiFlash 40 Recessed Window Flashing by Fortifiber.
 - 2. Furnish with prefabricated corner pieces, if available from sheet manufacturer. Provide manufacturer's edge and top sealant or mastic, and primers.

- D. Underlayment: ASTM D 226, Type II, asphalt-saturated organic felt, nonperforated.
- E. Metal Primer: For repair of Galvanized sheet metal, Zinc type, Galviline by ZRC or equal.
- F. Protective Backing Paint: Bituminous.
- G. Sealant: Two-component, polyurethane-type specified in Section 07 92 00, Joint Sealants.
- H. Solder: ASTM B32; Grade Sn50, flux type and alloy composition as required for use with metals to be soldered. Raw muriatic acid for galvanized steel; rosin for lead; non-corrosive soldering salts for uncoated copper and acid-type flux formulated for soldering stainless steel.
- I. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- J. Rosin-Sized sheathing paper: Sealtight Red Rosin Paper by W.R. Meadows.
- K. Termination Bar: Mill finished Extruded aluminum (6063 alloy) with radius corners.

2.3 PREFABRICATED COMPONENTS

- A. Reglets and Counterflashing: Surface-mounted or recessed as indicated on the drawings, galvanized steel, 24 gauge reglet with flashing in matching metal material, face and ends covered with plastic tape. SPRINGLOK; manufactured by Fry Reglet Corp., Alhambra, CA, or equal as approved in accordance with Division 01 for Substitutions.
 - 1. Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
 - 2. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
 - 3. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
 - 4. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.

2.4 FABRICATION

- A. Form sections true to shape, accurate in size, square and free from distortion or defects. Fabricate all components per SMACNA standards unless more stringent conditions are imposed by the Roofing Contractor, in that case the more stringent conditions shall prevail.
- B. Fabricate cleats and starter strips of same material as sheet, interlockable with sheet.
- C. Form pieces in longest practical lengths.

- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.
- F. Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form Seams, and solder.
- G. Solder lap seams of all non-moving metal joints and seal other metal joints, rivet to strengthen seam. After soldering, remove flux. Wipe and wash solder joints clean.
- H. Fabricate corners from one piece with minimum 18 inch long legs; solder seam for rigidity.
- I. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- J. Fabricate flashings to allow toe to extend 2 inches over roofing. Return and break edges.
- K. Provide expansion joints for gutters at every 30 feet. Fabricate per SMACNA details.

2.5 FINISH

- A. Not Exposed to Public View - Galvanized finish: ASTM A653/A653M-02, G90.
- B. Exposed to public View - Kynar 500, 70% PVDF Fluorocarbon coating, low gloss finish. 30-year Warranty. 2-Coat system: primer and topcoat. Colors per Finish Schedule on Drawings.
- C. Back paint concealed metal surfaces with protective backing paint when in contact with copper, redwood or red cedar.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set, cant strips and reglets in place and nailing strips located.
- B. Verify membrane termination and base flashings are in place, sealed and secure.
- C. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Field measure site conditions prior to fabricating Work.
- B. Install starter and edge strips and cleats before starting installation.
- C. Install reglets true to lines and levels. For surface-mounted seal top of reglets with sealant.
- D. Insert counterflashings into reglets to form tight fit. Seal flashings into reglets with sealant.

- E. Secure flashings in place using concealed fasteners. Use exposed fasteners only in locations approved by Architect.
- F. Lock and seal all joints.
- G. Apply plastic-cement compound between metal flashings and felt flashings.
- H. Fit flashings tight in place. Make corners square, surfaces true and straight in planes and lines accurate to profiles.
- I. Seal metal joints watertight.

3.3 INSTALLATION

- A. Parapet Copings and Flashings: Fabricate in minimum 96-inch long, but not exceeding 10-foot long sections. Use 20 gauge galvanized steel. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Provide all copings and caps of the types and shapes indicated on the Drawings. Install Self-Adhesive Flashing (Ice dam, high temperature) under copings. Build in integral expansion joints allowing for movement of the metal without resulting in distortion of coping or leaks of any kind. Miter corners, seal, and solder watertight. All Work shall be watertight.
- B. Roof Flashings: Provide roof flashings as indicated in drawings and required to complete entire project. Submit shop drawings showing details for approval, use minimum of 24 gauge galvanized steel.
- C. Roof Joint Cover Flashings: Provide roof joint covers as indicated in drawings. Submit shop drawings showing details for approval and use minimum of 24 gauge galvanized steel. Fabricate tops slope to drain.
- D. Equipment Roof Curbs and Flashing: Fabricate equipment roof curbs with 20 gauge galvanized steel, not less than 8" high, with 6" flanges, full welded construction. Provide curb flashings and counterflashings, 24 gauge galvanized sheet metal fully soldered and mitered corners. Lengths, sizes, quantities, and location to completely flash roof equipment curbs.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 07 84 00 - FIRESTOPPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Firestopping systems, products, materials and accessories.
- B. Through-penetration firestopping systems.
- C. Firestopping at intersections of fire-rated partitions and horizontal assemblies.
- D. Perimeter Fire Containment System - Safing insulation.
- E. Related Section:
 - 1. Section 01 35 42, CALGreen Requirements.
 - 2. Section 07 92 00, Joint Sealants
 - 3. 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. ASTM E84 - Surface Burning Characteristics of Building Materials.
- C. ASTM E814 - Fire Tests of Through-Penetration Firestops.
- D. ASTM E119 - Fire Tests of Building Construction and Materials.
- E. ANSI/UL 2079-98 - Tests for Fire Resistance of Building Joint Systems.
- F. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.
- G. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier System Using Intermediate-Scale, Multi-story Test Apparatus.
- H. UL Fire Resistance Directory, Latest Edition.
- I. UL Fire Resistance Directory for Perimeter Fire Containment System per UL XHDG and ULXHGU.
- J. UL 1479 - Fire Tests of Through-Penetration Firestops.
- K. UL 2079 Tests for Fire Resistance of Building Joint Systems.
- L. Chapter 7, 2022 California Building Code.
- M. California Green Building Standards Code, CALGreen 2022.

1.3 SUBMITTALS

- A. Product Data: Provide data on product characteristics, performance, and limitation criteria.

- B. CALGreen Submittals:
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code per 1.04.B.
- C. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
 - 1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- D. UL approval numbers for firestopping materials, devices and systems.
- E. State approvals for firestopping materials and devices and systems.

1.4 QUALITY ASSURANCE

- A. Qualifications
 - 1. Manufacturer: Company specializing in manufacture of products specified in this Section, with minimum five years' experience.
 - 2. Installer Qualifications: A firm that has been approved by either FMG or UL.
 - a. FMG 4991, "Approval of Firestop Contractors."
 - b. UL, "Qualified Firestop Contractor" program.
 - c. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its through-penetration firestop system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
- 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
- C. Regulatory Requirements
 - 1. Conform to Sections 714, 715 and 720.1, 2022 CBC for fire resistance standards and requirements for penetrations and joint systems in walls, partitions, floor-ceilings and roof-ceilings.
 - 2. Firestop Systems installation shall meet requirements of ASTM E814, UL 1479, or UL 2079 tested assemblies that provide fire rating equal to that of construction being penetrated.

3. Maintain one copy of current UL Fire Resistance Directory Listings, on jobsite at all times.
4. Firestopping systems shall meet temperature limitations as described in ASTM E119 and hose stream exposure as described in ASTM E814.
5. Firestopping system components shall consist of materials exhibiting limited combustibility, and shall have an oxygen index greater than 40 when tested in accordance with ASTM D2863. The flame spread rating shall be a maximum of 20 when tested in accordance with ASTM E84.
6. Firestopping system components shall have low smoke producing characteristics (less than 200) when tested in accordance with ASTM E84.
7. Electrical Boxes shall meet the requirements of UL 514.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when temperature of substrate material and ambient air is below manufacturer's minimum recommendations.
- B. Maintain ambient air temperature above this minimum temperature before, during and for 3 days after installation of materials.
- C. Provide ventilation in areas to receive solvent cured materials.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
- B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.
- C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.
- D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
- E. Do not use damaged or expired materials.

1.7 SEQUENCING

- A. Sequence Work to permit firestopping materials to be installed during or after adjacent and surrounding Work is complete.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Manufacturers, products and systems as listed in UL Fire Resistance Directory, are approved for use under this Section:
 1. Through-Penetration Firestop Systems, (XHEZ) Field-Erected Type.
 2. Fill, Void or Cavity Materials (XHHW), Installed at Jobsite.

3. Firestop Devices (XHJI), Factory Built Systems.
 - a. For Nonmetallic tubing, conduits, and cables for low voltage applications: Refer to Section 07 84 13.
4. Forming Materials (XHKU) Jobsite Applied.
5. Through-Penetrating Products (XHLY) Cable, Conduit, Pipe and Tubing.
6. Joint Systems (XHBN) showing Class II and Class III movement capabilities.
7. Perimeter Fire Containment Systems per XHDG and XHGU.
- B. Manufacturers, products and systems as listed in the WHI Certification Listings, are approved for use under this Section:
 1. Through-Penetration Firestop Systems: Listed in "Firestop Systems" Section.
- C. Materials and devices utilized in the above referenced systems shall be used only in those systems in which they were tested. Substitutions are not permitted.
- D. Or approved equal systems in compliance and listed in the UL Directory.

2.2 APPROVED FIRESTOPPING SYSTEMS

- A. Head-of-Wall Track: CEMCO Slotted Track (CST) 16 gauge, ICC ESR-2012 or equal as approved in accordance with Division 01, General Requirements for substitutions.
 1. Insulation Backer: mineral wool or cementitious fire proofing, per system UL Directory.
 2. Sealant: per system UL Directory.
 3. Install in accordance with manufacturer's approvals.
 4. Approval: Bearing UL Fire Resistance Classification and approve assembly.
- B. Head-of-Wall Track: FIRE TRAK CORP., KIMBALL, MN. or equal as approved in accordance with Division 01, General Requirements for substitutions.
 1. Deflection Track: FIRETRAK SHADOWLINE deflection track shall be attached to bottom flute of decking as recommended by manufacturer.
 2. Insulation Backer: mineral wool or cementitious fire proofing, per system UL Directory.
 3. Sealant: FS-90 National Gypsum or any of approved system under UL.
 4. Install one or two 5/8 inch thick sections of fire-rated gypsum board, 9 inches wide at deck flutes, both sides, custom fitted to within 1/8 to 3/8 inch of decking profile. Fill space with sealant, full depth, both sides.
 5. Approval: Bearing UL Fire Resistance Classification No. R15133 and approve assembly.

6. UL System: HW-D-0060, HW-D-0061, HW-D-0117 HW-D-0118 HW-D-1011 HW-D-1012, HW-D-1019 HW-D-1020 HW-D-0012 HW-D-0013 HW-D-0014 HW-D-0015
- C. 3M Inc., St Paul, MN www.3m.com/firestop
 1. Sealants, caulking, or spray materials used for openings between structurally separate sections of wall and floors, and top of wall conditions. Following products are acceptable:
 - a. 3M IC 15WB+ intumescent sealant.
 - b. 3M CP25WB+ intumescent sealant.
 - c. 3M FireDam 150+ acrylic latex sealant.
 - d. 3M Fire Barrier Mortar. Firestop Mortar.
 - e. 3M Fire Barrier 3000WT Water Tight Silicone Sealant
 - f. 3M FireDam Spray 200
 - g. Equivalent products listed in the U.L. Fire Resistance Directory - Volume 2
 2. Sealants, caulking or spray materials for use with fire-rated construction joints, edge of slab perimeter joints, and other gaps. Following products are acceptable:
 - a. 3M FireDam Spray 200
 - b. 3M FireDam 150+ acrylic latex sealant.
 - c. 3M Fire Barrier 1000 NS Silicone Sealant
 - d. 3M Fire Barrier 1003 SL Silicone Sealant
 - e. Equivalent products listed in the U.L. Fire Resistance Directory - Volume 2A, 2B.
 3. Cast-in place firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and cables bundles penetrating concrete floors, following products are acceptable:
 - a. 3M Fire Barrier Cast-in place MCID firestop device for use with Metallic penetrants
 - 1) Add Aerator adaptor when in used in conjunction with aerator (solvent) system.
 - b. 3M Tub Box Kit for use with tub installations.
 - c. 3M Fire Barrier Cast-in place PCID firestop device for use with noncombustible penetrants.
- D. Hilti Inc., Tulsa, OK.
 1. Sealants, caulking, or spray materials used for openings between structurally separate sections of wall and floors, and top of wall conditions. Following products are acceptable:
 - a. Hilti CP 672 Firestop Spray
 - b. Hilti CP 601s Elastomeric Firestop Sealant
 - c. Hilti CP 606 Flexible Firestop Sealant
 - d. Hilti CP 637 Firestop Mortar.
 - e. Equivalent products listed in the U.L. Fire Resistance Directory - Volume 2

2. Sealants, caulking or spray materials for use with fire-rated construction joints, edge of slab perimeter joints, and other gaps. Following products are acceptable:
 - a. Hilti CP 672 Firestop Spray
 - b. Hilti CP 601s Elastomeric Firestop Sealant
 - c. Hilti CP 606 Flexible Firestop Sealant
 - d. Equivalent products listed in the U.L. Fire Resistance Directory - Volume 2A, 2B.
3. Cast-in place firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and cables bundles penetrating concrete floors, following products are acceptable:
 - a. Hilti CP 680 Cast-in place firestop device.
 - 1) Add Aerator adaptor when in used in conjunction with aerator (solvent) system.
 - b. Hilti CP 681 Tub Box Kit for use with tub installations.
 - c. Hilti CP 682 Cast-in place firestop device for use with noncombustible penetrants.
4. Firestop Devices: Factory-assembled steel collars lined with intumescent material sized to fit specific outside diameter of penetrating item, the following products are acceptable:
 - a. Hilti CP 643N Firestop Collar
5. Fire Rated Cable Pathways: Hilti Speed Sleeve Brand device modules comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill, the following products are acceptable:
 - a. Hilti CP 653 Speed Sleeve
6. Firestop Drop-In-Device: Hilti Drop-In-Device Brand devices used with noncombustible and combustible pipes (closed and open systems), penetrating concrete floors, the following products are acceptable:
 - a. Hilti CFS DID (Drop-In-Device)
7. Wall Opening Protective Materials: Intumescent, non-curing pads or inserts for protection of electrical switch and receptacle boxes to reduce horizontal separation to less than 24", the following products are acceptable:
 - a. Hilti Firestop Box Inserts
 - b. Hilti CP 617 Puddy Pads
8. Firestop Putty: Intumescent, non-hardening, water resistant putties containing no solvents, inorganic fibers or silicone compounds, the following products are acceptable:
 - a. Hilti CP 618 Puddy Stick

9. Wrap Strips: Single component intumescent elastomeric strips faced on both sides with a plastic film, the following products are acceptable:
 - a. Hilti CP 648S Firestop Wrap Strip
 - b. Hilti CP 648E Firestop Wrap Strip
 10. Firestop Block: Re-enterable, non-curing, intumescent flexible 2 component polyurethane foam block, the following products are acceptable:
 - a. Hilti CP657 Fire Block
 11. Mortar: Portland cement based dry-mix product formulated for mixing with water at Project site to form a non-shrinking, water-resistant, homogenous mortar, the following products are acceptable:
 - a. Hilti CP 637 Firestop Mortar
 12. Silicone Foam: Multicomponent, silicone-based liquid elastomers, that when mixed, expand and cure in place to produce a flexible, non-shrinking foam, the following products are acceptable:
 - a. Hilti CP 620 Fire Foam
 13. Composite Sheet: Intumescent material sandwiched between a galvanized steel sheet and steel wire mesh protected with aluminum foil, the following products are acceptable:
 - a. Hilti CP 675T Firestop Board
 14. Firestop Plugs: Re-enterable, foam rubber plug impregnated with intumescent material for use in blank openings and cable sleeves, the following products are acceptable:
 - a. Hilti CP 658T Firestop Plug
- E. Rectorseal Corp., Houston, TX.
1. Insulation Backer: Fiberglass.
 2. Sealant: METACAULK 1100, sprayed, 1/8 inch thick, from metal deck to gypsum board, both sides.
 3. Sealant: Flamesafe FS 900 + Sealant.
 4. Approval: WHI TRC/PV 60-04, T & F rating 60 minutes, WHI TRC/PV 120-14, T & F rating 120 minutes.
- F. Specified Technologies, Inc., Somerville, NJ.
1. Latex Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture, the following products are acceptable:
 - a. SpecSeal Series SSS Intumescent Sealant
 - b. SpecSeal Series LCI Intumescent Sealant
 - c. SpecSeal Series LC Endothermic Sealant

- d. SpecSeal Series AS Elastomeric Spray
 - e. SpecSeal Series ES Elastomeric Sealant
2. Firestop Devices: Factory-assembled steel collars lined with intumescent material sized to fit specific outside diameter of penetrating item, the following products are acceptable:
- a. SpecSeal Series SSC Firestop Collars
 - b. SpecSeal Series LCC Firestop Collars
3. Fire Rated Cable Pathways: STI EZ-PATHPIs Brand device modules comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill, the following products are acceptable:
- a. EZ-PATHPIs Fire Rated Pathway
4. Wall Opening Protective Materials: Intumescent, non-curing pads or inserts for protection of electrical switch and receptacle boxes to reduce horizontal separation to less than 24", the following products are acceptable:
- a. SpecSeal Series SSP Firestop Putty Pads
 - b. SpecSeal Series EP PowerShield Insert Pads
5. Firestop Putty: Intumescent, non-hardening, water resistant putties containing no solvents, inorganic fibers or silicone compounds, the following products are acceptable:
- a. SpecSeal Series SSP Firestop Putty
6. Wrap Strips: Single component intumescent elastomeric strips faced on both sides with a plastic film, the following products are acceptable:
- a. SpecSeal Series RED2 Wrap Strip
 - b. SpecSeal Series BLU2 Wrap Strip
7. Firestop Pillows: Re-enterable, non-curing, mineral fiber core encapsulated with an intumescent coating contained in a flame-retardant poly bag, the following products are acceptable:
- a. SpecSeal Series SSB Firestop Pillows
8. Mortar: Portland cement based dry-mix product formulated for mixing with water at Project site to form a non-shrinking, water-resistant, homogenous mortar, the following products are acceptable:
- a. SpecSeal Series SSM Firestop Mortar
9. Silicone Sealants: Moisture curing, single component, silicone elastomeric sealant for horizontal surfaces (pourable or nonsag) or vertical surface (nonsag), the following products are acceptable:
- a. SpecSeal SIL300 Silicone Firestop Sealant
 - b. SpecSeal SIL300 SL Self-Leveling Silicone Firestop Sealant

10. Silicone Foam: Multicomponent, silicone-based liquid elastomers, that when mixed, expand and cure in place to produce a flexible, non-shrinking foam, the following products are acceptable:
 - a. Pensil 200 Silicone Foam
11. Composite Sheet: Intumescent material sandwiched between a galvanized steel sheet and steel wire mesh protected with aluminum foil, the following products are acceptable:
 - a. SpecSeal CS Composite Sheet
12. Cast-In-Place Firestop Device: Single component molded firestop device installed on forms prior to concrete placement with totally encapsulated, tamper-proof integral firestop system and smoke sealing gasket, the following products are acceptable:
 - a. SpecSeal CD Cast-In Firestop Device
13. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestop gasket for use on steel HVAC ducts, the following products are acceptable:
 - a. SpecSeal FyreFlange Firestop Angles
14. Firestop Plugs: Re-enterable, foam rubber plug impregnated with intumescent material for use in blank openings and cable sleeves, the following products are acceptable:
 - a. SpecSeal Series FP Firestop Plug
15. Fire-Rated T Rating Collar Device: Louvered steel collar system with synthetic aluminized polymer coolant wrap installed on metallic pipes where T Ratings are required by applicable building code requirements, the following products are acceptable:
 - a. SpecSeal T-Collar Device
16. Fire-Rated Cable Grommet: Molded two-piece grommet made from plenum grade polymer with a foam inner core for sealing individual cable penetrations up to 0.27 in. diameter, the following products are acceptable:
 - a. Ready Firestop Grommet
- G. Smoke and Acoustical sealants: Specified in Section 07 92 00.
- H. Color: White color where exposed to public.
- I. Or equal in accordance with Division 01, General Requirements.

2.3 FIRESTOPPING AT ELECTRICAL BOXES AND UTILITY OUTLETS

- A. Steel electrical outlet boxes on opposite sides of walls requiring protected openings shall be separated by horizontal distance of 24 inches.

- B. Steel electrical outlet boxes that occur in combination with outlet boxes of size such that aggregate area of unprotected outlet boxes exceeds 100 square inches in any 100 square feet of wall area shall be protected by approved material or detail to decrease aggregate area of unprotected utility boxes to less than 100 square inches in any 100 square feet of wall.
- C. Steel electrical outlet boxes that do not exceed 16 square inches in area shall be protected by an approved firestop material: at each side of wall:
 - 1. CP 617 and CP 617L MOLDABLE FIRESTOP PUTTY PADS, by Hilti Inc. Tulsa, OK.
 - 2. MPP-4S MOLDABLE PUTTY PADS, by 3M Contractor Products, Minneapolis, MN.
 - 3. FSP FIRESTOP PUTTY PADS, by Hevi-Duty Nelson Products, Tulsa, OK.
 - 4. SPECSEAL PUTTY PADS, By Specified Technologies, Inc., Somerville NJ.
 - 5. Johns Manville, Denver CO. Firetemp Puddy Pad.
 - 6. Or equal as approved in accordance with Division 01, General Requirements for Substitutions.
- D. Utility and electrical outlets or boxes shall be securely fastened to the stud or framing of the wall, or ceiling assembly. The opening in the gypsum board facing shall be cut so that the clearance between the box and the gypsum board does not exceed 1/8 inch.
 - 1. In smoke walls the 1/8 inch clearance shall be filled with an approved fire-rated sealant.

2.4 SAFING INSULATION - PERIMETER FIRE CONTAINMENT SYSTEMS

- A. Mineral Wool / Fire Safing Insulation: 4-inch thick, 4 pcf, noncombustible, moisture-resistant, noncorrosive, non-deteriorating, synthetic vitreous fiber bound in a matrix.
 - 1. Fiber: rock- or slag-wool fiber, or man-made vitreous fiber
 - 2. ASTM E 136, Combustibility: NFPA Standard 220, non-combustible
 - a. ASTM E 84, Flame Spread Index: 0
 - b. ASTM E 84, Smoke Developed Index: 0
 - 3. Recycled Content: 70-percent, minimum
 - 4. Acceptable Products: Thermafiber, Safing Insulation, Johns Manville MinWool Safing.
- B. Fill, Void or Cavity Material: Static; USG Types FC (1" Firecode Compound), RFC (Ready Mixed Firecode Compound). UL Listed, R11822
- C. Locations: as indicated in drawings, and at all gaps, crevices and openings between multistory floors and walls requiring Fire Rated protection.

- D. Insulation shall be as approved in accordance with Division 01, General Requirements for substitutions and shall be UL listed.
1. Curtain Wall Insulation; Mineral wool, Foil-Faced Thermafiber CW Firespan 90, 2 inches thick panel insulation and 1 inch thick by 8 wide at aluminum mullions, or 4 inches thick at stud walls. Opposite side faced with black mat. Secure with impaling pins and clinch shields at 12 inches on center, attach impaling pins to perimeter steel angles, 2" x 2" x 2", screw attached to mullion. Install a steel angle horizontally behind insulation at safing line. ICC-ES Legacy Report No. VAR-1025 and ER-2331.
 2. Safing; Mineral wool, Thermafiber LLC, Thermafiber Safing Insulation Type SAF, 4 inches thick min. at all floors between aluminum curtain wall or framed stud walls and concrete floors or concrete/metal deck floors. Compression fit and support with safing Z-clips at 12 inches o.c. Install 1 inch thick USG Firecode Compound, Types FC, RFC, tight over entire safing. Fire Hazard Classification, Flame Spread 15, Smoke Developed 0, shall meet Federal Specifications HH-1-521E, Type I, Class A/HH-1-521E, Form A, Classes 1 and 2, THERMAFIBER SAFING INSULATION, ICC-ES Legacy Report No. VAR-1025 and ER-2331.
 3. THERMAFIBER LLC, Wabash, Indiana. Firespan Insulation, UL R4643.
 - a. UL System Number: CW-S-1001, 5/8" thick Exterior Fire Code Gypsum Board or Cement Board spandrel sheathing substrate over steel stud framed wall and exterior finish.
 - b. UL System Number: CW-S-2001 [CW-D-2001], 1/4" Spandrel Glass.
 - c. UL System Number: CW-S-2002 [CW-D-2002], 1/8" thick aluminum spandrel panel with 1/4" thick edges.
 4. Any Perimeter Fire Containment System per UL XHDG and UL XHGU.
- E. Spandrel panel assembly shall meet requirements for two-hour fire rating.

2.5 ACCESSORIES

- A. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
1. Permanent forming/damming/backing materials.
 2. Substrate primers.
 3. Collars.
 4. Steel sleeves.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions.
- B. Verify that openings are ready to receive Work of this Section.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material or other matter that may affect bond of firestopping material.
- B. Remove incompatible materials that affect bond.
- C. Install backing materials to arrest liquid material leakage.

3.3 APPLICATION

- A.  Install fluted through penetration firestopping system per Section 09 22 16 [05 40 00].
- B. Apply primer, firestop sealant or other firestop materials in accordance with manufacturer's recommendations and as approved by regulatory agencies. Apply at voids between fire-rated assemblies and adjoining fire-rated materials or assemblies.
- C. Apply firestopping materials with sufficient thickness or configuration to achieve designated fire rating.
- D. Install firestopping material in locations where designated fire rating must be maintained, including, but not limited to following:
 - 1. Voids or annular openings around sleeves, piping, ductwork or electrical/communications conduits that penetrate fire rated walls, partitions, floors, ceilings or assemblies.
 - 2. Intersections of fire-rated vertical and horizontal assemblies, including but not limited to door and window frames.
- E. Remove dam material after firestopping material has cured.
- F. Safing Insulation: Install compression fit and with support accessories specified where required.

3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
 - 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.

3.5 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished Work.
- B. Protect adjacent surfaces from damage by material installation.

3.7 INSPECTION

- A. Notify Inspector before Work is covered. Approval of Inspector shall be received before any Work is concealed in manner that will make inspection difficult. Work that has been covered prior to inspection and approval shall be uncovered, inspected and recovered.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

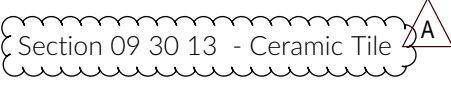
SECTION 08 31 13 – ACCESS DOORS

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
- B.  Section 09 30 13 - Ceramic Tile
- D. Section 09 90 00 - Painting
- E. Divisions 22, 23, 26, 27, and 28: Mechanical and Electrical components requiring access.

1.3 REFERENCE STANDARDS

- A. ITS (DIR) - Directory of Listed Products; current edition.
- B. UL (FRD) - Fire Resistance Directory; Current Edition.
- C. Conform to reference standards by date of issue current on date of Contract Documents.
- D. UL - Underwriter's Laboratories.
- E. WH - Warnock Hersey.
- F. NAAMM - National Association of Architectural Metal Manufacturers

1.4 SUBMITTALS

- A. 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.
- B. 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.
- C. Manufacturer's Installation Instructions: Indicate installation requirements.
- D. 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 COORDINATION

- 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.
- F. Provide access doors for equipment / components requiring access or service whether shown or not in contract documents.

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 30-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. 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. Solid Ceilings / Soffits: 30 inch x 30 inch heavy duty with headroom of 30 inches or more.

3. Solid Ceilings / Soffits: 12 inch x 12 inch with headroom less than 30 inches.
4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle, access doors, 12" x 12".
 - a. Access doors larger than 12" x 12", provide heavy duty access doors per item B/4 (below).

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 Section 01 60 00 - Product Requirements.

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 to match adjacent paint color surfaces.
 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

SECTION 08 71 00 – DOOR HARDWARE

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Door hardware.
 - 2. Storefront and entrance door hardware.
- B. Related Divisions:
 - 1. Division 06 – Door hardware installation
 - 2. Division 07 – Sealant at exterior thresholds
 - 3. Division 08 – Metal doors and frames, interior aluminum frames, wood doors, integrated security systems, specialty doors, storefront and glazed curtainwall systems.
 - 4. Division 10 – Operable partitions
 - 5. Division 21 – Fire and life safety systems
 - 6. Division 28 – Security access systems
- C. Allowances:
 - 1. Procure scheduled Best brand temporary and permanent cylinder cores and keys from (Owner's lock shop / Owner's Physical Plant Maintenance Dept). Allow \$45 per core and \$7.50 per key. Owner's agent will purchase the cores and keys directly from Best Access Systems or provide the units from Owner's attic stock.
- D. Specific Omissions: Hardware for the following is specified or indicated elsewhere.
 - 1. Windows.
 - 2. Cabinets, including open wall shelving and locks.
 - 3. Signs.
 - 4. Toilet accessories, including grab bars
 - 5. Installation
 - 6. Rough hardware.
 - 7. Conduit, junction boxes & wiring.

8. Folding partitions.
9. Sliding aluminum doors.
10. Access doors and panels.
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 2016 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
 - d)
 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. Date of jobsite visit.
- 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. Qualifications:
 - 1. Hardware supplier: direct factory contract supplier who employs a hardware consultant, available at reasonable times during course of work for project hardware consultation to Owner, Architect and Contractor.
 - a) Responsible for detailing, scheduling and ordering of finish hardware. Detailing implies that the submitted schedule of hardware is correct and complete for the intended function and performance of the openings.
- B. Hardware: Free of defects, blemishes and excessive play. Obtain each kind of hardware (latch and locksets, exit devices, hinges and closers) from one manufacturer.
- C. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.
- D. 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.
- E. Furnish hardware items required to complete the work in accordance with specified performance level and design intent, complying with manufacturers' instructions and code requirements.
- F. Pre-Installation Meetings: Initiate and conduct with supplier, installer and related trades, coordinate materials and techniques, and sequence complex hardware items and systems installation. Include manufacturers' representatives of locks, panic hardware and door closers in the meetings. Convene prior to commencement of related work.

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. Electrified hardware: Electrical drawings and electrical specifications are based on the specific electrified hardware components specified in hardware sets. These electronic hardware components have been specified as an assembly. Changes to these components shall be submitted to the Architect for approval.
- B. 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.
- C. 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. 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
 6. Coordinate: flush top rails of doors at outswinging exteriors, and throughout where adhesive-mounted seals occur.
 7. Manufacturers' templates to door and frame fabricators.
- D. Check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.
- E. Environmental considerations: segregate unused recyclable paper and paper product packaging, uninstalled metals, and plastics, and have these sent to a recycling center.
- F. Prior to submittal, carefully inspect existing conditions to verify finish hardware required to complete Work, including sizes, quantities, existing hardware scheduled for re-use, and sill condition material. If conflict between the specified/scheduled hardware and existing conditions, submit request for direction from Architect. Include date of jobsite visit in the submittal.

1. Submittals prepared without thorough jobsite visit by qualified hardware expert will be rejected as non-compliant.

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. Locksets: Five years
 2. Exit Devices: Three years mechanical
 3. Closers: Thirty years mechanical
 4. Hinges: One year
 5. 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.
 2. With installer, access control contractor and electrical contractor present, test electrical, electronic and electro-pneumatic hardware systems for satisfactory operation.
 3. With installer and electrical contractor present, test hardware interfaced with fire/life-safety system for proper operation and release.

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. Low-energy powered doors: comply with ANSI/BHMA A156.19. Reference: 2022 California Building Code Section 11B-404.2.9, Exception 2.
1. Where powered door serves an occupancy of 150 or more, provide back-up battery power or stand-by generator power, capable of supporting a minimum of 100 cycles.
 2. Actuators, vertical bar type: minimum 2-inches wide, 30-inches high, bottom located minimum 5-inches above floor or ground, top located minimum 35-inches above floor or ground. Displays International Symbol of Accessibility, per 2022 California Building Code Section 11B-703.7.
 3. Actuators, plate type: use two at each side of the opening. Minimum 4-inches diameter or 4-inches square. Displays International Symbol of Accessibility, per 2022 California Building Code Section 11B-703.7. Locate centerline of lower plate between 7- and 8-inches above floor or ground, and upper plate between 30- and 44-inches above floor or ground.
 4. Actuator location: conspicuously located, clear and level floor/ground space for forward or parallel approach.
- E. 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
- F. 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.
- G. 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: In alterations, a projection of 5/8 inch (15.9 mm) maximum into the required clear width shall be permitted for the latch side stop.

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.
- H. 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.
- I. Floor stops: Do not locate in path of travel. Locate no more than 4 inches from walls, per DSA Policy #99-08 (Access).
- J. 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.
- K. Door and door hardware encroachment: Doors, when fully open, shall not reduce the required width by more than 7 inches. Doors in any position shall not reduce the required width by more than one-half. 2022 California Building Code, Section 1005.7.1.
 1. In I-2 occupancies, surface mounted latch release hardware is not permitted to project in the required egress width, regardless of its mounting height, per 2022 California Building Code, Section 1005.7.1 at Exception 1.
- L. In groups I-2 or I-2.1 occupancies, doors serving as a means of egress where used for the movement of beds and stretcher patients shall provide a minimum clear opening width of 44 inches. At pair openings that includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 44 inches. 2022 California Building Code, Section 1010.1.1.
- M. In group I-2 or I-2.1 occupancies, there shall be no projections into the clear width of doors used for the movement of beds and stretcher patients in the means of egress. 2022 California Building Code, Section 1010.1.1.1 at Exception 2.

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	Stanley
Continuous Hinges	(IVE) Ives	Select
Key System	(BES) Best	District Standard
Mechanical Locks	(BES) Best	District Standard
Exit Devices	(SAR) Sargent	District Standard
Closers	(LCN) LCN	District 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

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.
- D. Continuous Hinges:
 - 1. Geared-type aluminum.
 - a. Use wide-throw units where needed for maximum degree of swing, advise architect if commonly available hinges are insufficient.
 - b. If units are used at storefront openings, color-coordinate hinge finish with storefront color. Custom anodizing and custom powdercoat finishes subject to Architect approval.

2.3 LOCKSETS, LATCHSETS, DEADBOLTS

- A. Mortise Type Locks and Latches:
 - 1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra- Heavy Duty, Security Grade 2 and be UL10C.
 - 2. Fit ANSI A115.1 door preparation.
 - 3. Functions and design as indicated in the hardware groups.
 - 4. Solid, one-piece, 3/4-inch (19mm) throw, anti-friction latchbolt made of self-lubricating stainless steel.
 - 5. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel.
 - 6. Latchbolt and Deadbolt are to extend into the case a minimum of 3/8 inch (9.5mm) when fully extended.
 - 7. Auxiliary deadlatch to be made of one-piece stainless steel, permanently lubricated.
 - 8. Provide curved-lip strike with dust box for each latch or lock bolt, with lip extended to protect frame, finished to match door hardware set, unless otherwise indicated.
 - 9. Lever handles must be of forged or cast brass, bronze or stainless-steel construction and conform to ANSI A117.1. Levers that contain a hollow cavity are not acceptable.

10. Lock shall have self-aligning, thru-bolted trim.
11. Levers to operate a roller bearing spindle hub mechanism
12. Mortise cylinders of lock shall have a concealed internal setscrew for securing the cylinder to the lockset. The internal setscrew will be accessible only by removing the core, with the control key, from the cylinder body.
 - a. Spindle to be designed to prevent forced entry from attacking of lever
 - b. Provide locksets with 7-pin removable and interchangeable core cylinders
 - c. Each lever to have independent spring mechanism controlling it
 - d. Core face must be the same finish as the lockset

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. No exposed screws to show through glass doors.
6. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.
7. 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.
8. Exterior doors scheduled with XP-series devices: Static load force resistance of at least 2000 pounds.
9. 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 with indication.

2. Lever Trim: breakaway type, forged brass or bronze escutcheon min. 0.130 inch thickness, compression spring drive, match lockset lever design.
3. Fire-Labeled Devices: UL label indicating "Fire Exit Hardware". Vertical rod devices less bottom rod (LBR) unless otherwise scheduled.
4. 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.
5. Accepted substitutions: None, District Standard.

2.5 CLOSERS

- A. Surface Closers: [4041XP]
 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 2016 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 leaves 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, District Standard.

2.6 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.
- E. Seals: Four-fingered type at head & jambs. Inelastic, rigid back, not subject to stretching. Self-compensating for warp, thermal bow, door settling, and out-of-plumb. Adhesive warranted for life of installation.
 1. Proposed substitutions: submit for approval.
 2. Three-fingered type at hinge jambs of doors fitted with continuous hinges where jamb leaf of hinge is fastened to the frame reveal.
- F. 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. Provide surface mounted automatic door bottom. 
 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.
- G. 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.
- H. 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.

2.7 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.

2.8 KEYING REQUIREMENTS

- A. Key System: Verify with Owner. Existing Best Access Systems small format interchangeable core system, procured per Allowances in (see spec section for Allowances). Owner's agent will install the cores prior to Substantial Completion. Initiate and conduct meeting(s) with Owner to determine system structure and keybow styles, furnish Owner's written approval of the system; do not order keys or cylinders without written confirmation of actual requirements from the Owner. Owner will order and supply permanent cylinders/cores.
- B. Interchangeable Cores: 7-pin solid brass construction.
- C. Permanent cores: furnish factory-keyed.

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 44 inches above the finished floor, per California Building Code, Section 1010.1.9.2 and 11B-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.
- J. Provide manufacturer's recommended brackets to accommodate the mounting of closers on doors with flush transoms.

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. Inspection of fire door assemblies and means-of-egress panic-hardware doors: Per 2016 NFPA-80 5.2.1: hire an independent third-party inspection service to prepare a report listing these doors, and include a statement that there are zero deficiencies with the fire-rated assemblies and the openings with panic hardware.
- C. 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.
- D. 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.

HARDWARE GROUP NO. 01

For use on Door #(s):

109.1

2	EA	CONT. HINGE	112XY		628	IVE	
1	EA	PANIC HARDWARE	16 18 NBPE8710 x EO		630	SAR	
1	EA	PANIC HARDWARE	16 18 70 NBPE8706 ETL		630	SAR	
2	EA	MORTISE CYLINDER	(OWNER STANDARD)		626	BES	
1	EA	RIM CYLINDER	(OWNER STANDARD)		626	BES	
3	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES	
1	EA	CYLINDER GUARD RING	K-24		626	KEE	
2	EA	90 DEG OFFSET PULL	8190HD 12" O		630	IVE	
2	EA	SURFACE CLOSER	4040XP HEDA		689	LCN	
2	EA	PA MOUNTING PLATE	4040XP-18PA SRT (AS REQUIRED)		689	LCN	
1	EA	BLADE STOP SPACER	4040XP-61 SRT (AS REQUIRED)		689	LCN	
2	EA	FLOOR STOP	FS18L		BLK	IVE	
1	EA	RAIN DRIP	142AA (OMIT @ OVERHANG)		AA	ZER	
1	EA	SEAL	WEATHER SEALS BY DOOR/FRAME MANUFACTURER/SUPPLIER				
2	EA	DOOR SWEEP	39A		A	ZER	
1	EA	THRESHOLD	103A-223 (OR AS REQ'D. OR PER DETAILS/CONDITIONS)		A	ZER	

VERIFY EXISTING CONDITIONS PRIOR TO ORDERING HARDWARE.
WIDE STILE ALUMINUM DOORS.

HARDWARE GROUP NO. 02

For use on Door #(s):

106.1

106.2

3	EA	HINGE	5BB1 SH 4.5 X 4.5 NRP		630	IVE	
1	EA	INTRUDER LOCK	45H-7-INL-3-M-VIN		626	BES	
2	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES	
1	EA	LOCK GUARD	LG10		630	IVE	
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN	
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE	
1	EA	FLOOR STOP	FS18L		BLK	IVE	
1	EA	RAIN DRIP	142AA (OMIT @ OVERHANG)		AA	ZER	
1	SET	SET SEAL	429AA-S (@ HEAD & JAMBS)		AA	ZER	
1	EA	DOOR SWEEP	39A		A	ZER	
1	EA	THRESHOLD	103A-223 (OR AS REQ'D. OR PER DETAILS/CONDITIONS)		A	ZER	

MOUNT HEAD SEAL BEFORE CLOSER ARM.
VERIFY EXISTING CONDITIONS PRIOR TO ORDERING HARDWARE.

HARDWARE GROUP NO. 03

For use on Door #(s):

110.1

3	EA	HINGE	5BB1HW SH 4.5 X 4.5 NRP	630	IVE
1	EA	ELEC PANIC HARDWARE	AL 55 OE8804 ETL (RX REQUIRES LOW VOLTAGE)	630	SAR
1	EA	MORTISE CYLINDER	(OWNER STANDARD)	626	BES
1	EA	RIM CYLINDER	(OWNER STANDARD)	626	BES
2	EA	PERMANENT CORE	(OWNER STANDARD)	626	BES
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS18L	BLK	IVE
1	EA	RAIN DRIP	142AA (OMIT @ OVERHANG)	AA	ZER
1	SET	SET SEAL	429AA-S (@ HEAD & JAMBS)	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	103A-223 (OR AS REQ'D. OR PER DETAILS/CONDITIONS)	A	ZER

MOUNT HEAD SEAL BEFORE CLOSER ARM(S).

HARDWARE GROUP NO. 04

For use on Door #(s):

111.1

112.1

1	EA	CONT. HINGE	112XY	628	IVE
1	EA	INTRUDER LOCK	45H-7-INL-3-M-VIN	626	BES
2	EA	PERMANENT CORE	(OWNER STANDARD)	626	BES
1	EA	LOCK GUARD	LG10	630	IVE
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	MOUNTING PLATE	4040XP-18 SRT (AS REQUIRED)	689	LCN
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	EA	SEAL	DOOR SEALS BY DOOR/FRAME MANUFACTURER/SUPPLIER		
1	EA	THRESHOLD	544A OR 545A (AS REQUIRED)	A	ZER

WIDE STILE ALUMINUM DOORS.

HARDWARE GROUP NO. 05

For use on Door #(s):

101.1

3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	INTRUDER LOCK	45H-7-INL-3-M-VIN	626	BES
2	EA	PERMANENT CORE	(OWNER STANDARD)	626	BES
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	EA	SEAL	1882BK, 429AA-S, 328AA-S, 361AA	AA	ZER
1	EA	THRESHOLD	544A OR 545A (AS REQUIRED)	A	ZER

WALNUT HIGH SCHOOL
RENOVATIONS AT LIBRARY AND MEDIA CENTER
WALNUT VALLEY UNIFIED SCHOOL DISTRICT
SGH Project No. 22-47104-00

DOOR HARDWARE
Section 08 71 00
Page 20 of 26

HARDWARE GROUP NO. 06

For use on Door #(s):
106.3

3	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	INTRUDER LOCK	45H-7-INL-3-M-VIN		626	BES
2	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	SURFACE CLOSER	4040XP RW/PA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D		626	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER

HARDWARE GROUP NO. 07

For use on Door #(s):
109.2

3	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	INTRUDER LOCK	45H-7-INL-3-M-VIN		626	BES
2	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER

HARDWARE GROUP NO. 08

For use on Door #(s):
102.1

3	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	OFFICE LOCK	45H-7-AT-3-M-VIT		626	BES
1	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D		626	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER

HARDWARE GROUP NO. 09

For use on Door #(s):
107.1

3	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	OFFICE LOCK	45H-7-AT-3-M-VIT		626	BES
1	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	FLOOR STOP	FS436/438 AS REQ'D		626	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER

HARDWARE GROUP NO. 10

For use on Door #(s):

114.1

115.1

3	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	PRIVACY LOCK	45H-7-LT-3-M-VIN		626	BES
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CCV AS REQ'D		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER

HARDWARE GROUP NO. 11

For use on Door #(s):

103.2

117.2

6	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	CONST LATCHING BOLT	FB51P		630	IVE
1	EA	DUST PROOF STRIKE	DP1/2 AS REQ'D		626	IVE
1	EA	STOREROOM LOCK	45H-7-D-3-M		626	BES
1	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	MOUNTING BRACKET	MB AS REQ'D		689	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH		693	LCN
1	EA	ASTRAGAL	44STST OR BY DOOR MFG.		STST	ZER
2	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 12

For use on Door #(s):

113.1

6	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	CONST LATCHING BOLT	FB51P		630	IVE
1	EA	DUST PROOF STRIKE	DP1/2 AS REQ'D		626	IVE
1	EA	STOREROOM LOCK	45H-7-D-3-M		626	BES
1	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	MOUNTING BRACKET	MB AS REQ'D		689	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH		693	LCN
1	EA	ASTRAGAL	44STST OR BY DOOR MFG.		STST	ZER
2	EA	SILENCER	SR64		GRY	IVE

VERIFY EXISTING CONDITIONS PRIOR TO ORDERING HARDWARE.

HARDWARE GROUP NO. 13

For use on Door #(s):

105.1

3	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	STOREROOM LOCK	45H-7-D-3-M		626	BES
1	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 14

For use on Door #(s):

112.2

3	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	STOREROOM LOCK	45H-7-D-3-M		626	BES
1	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

VERIFY EXISTING CONDITIONS PRIOR TO ORDERING HARDWARE.

HARDWARE GROUP NO. 15

For use on Door #(s):

104.1

3	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	STOREROOM LOCK	45H-7-D-3-M		626	BES
1	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	WALL STOP	WS406/407CCV AS REQ'D		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 16

For use on Door #(s):

100.1

3	EA	HINGE	5BB1 4.5 X 4.5		626	IVE
1	EA	STOREROOM LOCK	45H-7-D-3-M		626	BES
1	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP ST-1630		689	LCN
1	EA	TOP JAMB MTG PLATE	4040XP-18TJ SRT		689	LCN
3	EA	SILENCER	SR64		GRY	IVE

HARDWARE GROUP NO. 17

For use on Door #(s):

116.1

117.1

EA	NOTE	ALL HARDWARE BY FOLDING DOOR MANUFACTURER/SUPPLIER	B/O

HARDWARE GROUP NO. 18

For use on Door #(s):

103.1

3	EA	HINGE	5BB1HW SH 4.5 X 4.5 NRP		630	IVE
1	EA	PANIC HARDWARE	12-NB-8715-F-ETL-84		630	SAR
2	EA	RIM CYLINDER	(OWNER STANDARD)		626	BES
2	EA	PERMANENT CORE	(OWNER STANDARD)		626	BES
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS18L		BLK	IVE
1	EA	RAIN DRIP	142AA (OMIT @ OVERHANG)		AA	ZER
1	SET	SET SEAL	429AA-S (@ HEAD & JAMBS)		AA	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	103A-223 (OR AS REQ'D. OR PER DETAILS/CONDITIONS)		A	ZER

VERIFY EXISTING CONDITIONS PRIOR TO ORDERING HARDWARE.
MOUNT HEAD SEAL BEFORE CLOSER ARM(S).

HARDWARE GROUP NO. 19

For use on Door #(s):
103.3

3	EA	HW HINGE	5BB1HW 4.5 X 4.5	626	IVE
1	EA	PANIC HARDWARE	12-NB-8715-F-ETL-84	630	SAR
2	EA	RIM CYLINDER	(OWNER STANDARD)	626	BES
2	EA	PERMANENT CORE	(OWNER STANDARD)	626	BES
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

VERIFY EXISTING CONDITIONS PRIOR TO ORDERING HARDWARE.

HARDWARE GROUP NO. 20

For use on Door #(s):
117.3

3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	STOREROOM LOCK	45H-7-D-3-M	626	BES
1	EA	PERMANENT CORE	(OWNER STANDARD)	626	BES
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

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.
- C. Related Section(s):
 - 1. Section 08 12 13, Hollow Metal Frames
 - 2. Section 08 41 00, Aluminum Entrance Doors.
 - 3. Section 08 41 13, Interior Aluminum Storefront
 - 4. Section 08 43 29, Interior Sliding Storefront.
 - 5. Energy calculations or prescriptive compliance documents

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. GL-1
Insulating Glass Units, Low-E Coated: double pane with silicone sealant edge secondary seal and polyisobutylene primary seal with aluminum spacer, clear anodized. Outboard lite of 1/4 inch tinted Fully-Tempered glass , ASTM C1048, Kind FT with Low-E coating on surface 2. Inboard lite of 1/4 inch clear tempered, Kind FT, glass, Category I, CPSC 16 CFR 1201. Category II for units less than 18" above floor, and top edge greater than 36". Low-E coating on surface 2, interpane space purged dry air; total unit thickness of one inch. Solarban 60, sputter-coated
 - 1. Vitro Solarban 60
 - a. Solargray (Color to match existing glazing) + Clear: Visible Light Transmittance of 61%, Exterior Reflectance of 9%, SHGC of 0.32, shading coefficient 0.37.
- B. GL-2
Safety Glass: ASTM C1048, Kind FT fully tempered, Condition A uncoated, Type I transparent glass, Class 1 Clear, Quality-Q3 Glazing select, 1/4-inch-thick minimum. All safety glass shall pass the test requirements of CPSC 16 CFR 1201 criteria, for Category I or II as indicated in Table 2406.2(1), CBC and below, and for Hazardous locations per Section 2406.4:
 - 1. 9 sq. ft. or less: Category I
 - 2. More than 9 sq. ft.: Category II



- C. GL-3
Insulating Glass Units, Low-E Coated; double pane with silicone sealant edge secondary seal and polyisobutylene primary seal with aluminum spacer, clear anodized. Outboard lite of 1/4 inch Fully-

A

Tempered Glass, ASTM C1048, Kind FT with Ceramic frit silkscreen on surface 2. Inboard lite of ¼ inch clear tempered, Kind FT, glass, Category I, CPSC 16 CFR 1201. Category II for units less than 18" above floor, and top edge greater than 36". Low-E coating on surface 2, interpane space purged dry air; total unit thickness of one inch. Solarban 60, sputter-coated.

1. Vitro Solarban 60
 - a. Solargray (Color to match existing glazing) + Clear; Visible light Transmittance of 61%, Exterior Reflectance of 9%, SHGC of 0.32, shading coefficient 0.37.

D. GL-4

Safety Glass: ASTM C1048, Kind FT fully tempered, Condition A uncoated, Type I transparent glass, Class 1 Clear, Quality-Q3 Glazing select, 1/4-inch-thick minimum. Digital print frosted glazing pattern one side only, as indicated on drawings.

All safety glass shall pass the test requirements of CPSC 16 CFR 1201 criteria, for Category I or II as indicated in Table 2406.2(1), CBC and below, and for Hazardous locations per Section 2406.4:

1. 9 sq. ft. or less: Category I
2. More than 9 sq. ft.: Category II

E. Refer to Drawings for Schedule for Finishes.

2.3 FIRE RATED GLASS

A. Products of the following manufacturers form the basis for design and quality intended.

1. SAFTIFIRST San Francisco CA. Product: UL R25002
2. Technical Glass Products, Kirkland, WA. UL R13377
3. Pilkington Libbey-Owens-Ford Co, Toledo, OH.
4. AGC Glass Company, Alpharetta, GA.
5. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

B. Fire-Rated Glass Materials

1. TGP Premium FireLite Plus 5/16" thick, clear laminated fire rated, impact safety-rated glass ceramic, CPSC 16 CFR 1201 Category
 - a. 20 minute rated: 3,204 sq. in. max. at doors, max. width 36", max. ht. 89". (3,325 sq. in. max. at non-doors, max. width 95", max. ht. 95").
 - b. 45 minute rated: at doors 3,204 sq. in. max., max. width 36", max. ht. 89" (3,325 sq. in. max. at non-doors), max. width 95", max. ht. 95".
 - c. 60 minute: doors 3,204 sq. in. max. at doors, max. width 36", max. ht. 89"

(3,325 sq. in. max. at other than doors, max. width 95", max. ht. 95"), (100 sq. in. max. at temperature-rise doors)

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 01 35 42 – CALGreen Requirements.
 - 2. Section 03 30 00 - Cast-In Place Concrete.
 - 3. Division 09 Sections for 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 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 contaminates 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 receive adhered floor coverings 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 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 06 10 00, Rough Carpentry
 - 3. Section 07 84 00, Fire Stopping
 - 4. Section 07 92 00, Sealants
 - 5. Section 09 30 13, Ceramic Tile.
 - 6. 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 Suspended gypsum board ceiling.

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] [25A-A], 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 a 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. Finish: **Level 5, smooth.**
- 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 2504A, 2511A and reference standard listed in Table 2506.2, California Building Code and DSA, IR 25-3.13, 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.

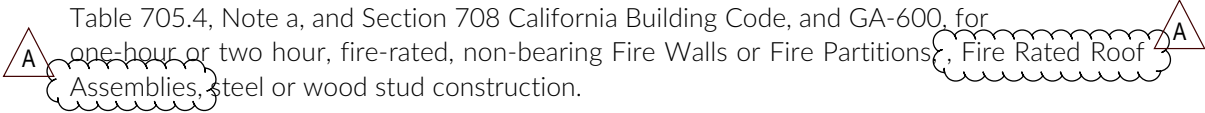
G. Light Fixture Support:

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, 
 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, and fire-rated sealant for rated walls per section 07 84 00.
- 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. Fire-Rated Partitions and Fire Rated Roof Assemblies: Perimeters of fire-rated partitions shall be caulked with fire-rated sealant as specified in Section 07 84 00, both sides of partition.
- E. 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.
- F. 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.
- G. Gypsum board finish shall be to the following levels as defined by GA-214:
 - 1. Plenum areas above ceilings - Level 1.
 - 2. Substrate for tile, tackable wall panels, tackboards and markerboards - Level 2.
 - 3. All Areas receiving Wall Coverings or Exposed to view: non-textured, flat, egg-shell, gloss or semi-gloss paint - 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 FINISHES

- A. Provide Smooth Level 5 Mock-up for Architect's approval before proceeding with Work.

3.7 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.

3.8 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.

3.9 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 30 13 – CERAMIC TILE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Ceramic Tile over mortar bed at depressed floor slabs and ceramic tile at walls and base using thinset application method.
- B. Related Sections.
 - 1. Section 01 35 42, CALGreen Requirements.
 - 2. 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. California Green Building Standards Code, CALGreen - 2022.
- 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. 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.
- 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. 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.
- 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

1.05 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. No 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: Profilitec

2. Product: Mosaitect 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: SETTING BED AT FLOORS

- A. Install setting bed in accordance with TCNA Handbook for Ceramic Tile Installation, ANSI/TCNA A108.1B.
- B. Install cleavage membrane, solvent welded at joints. Clamp membrane to drains. Extend membrane under expansion joints.
 - 1. At floor slabs on-grade; Do not install cleavage membrane.
- C. Place wire reinforcing and setting bed over cleavage membrane. Lap reinforcing at least one full mesh and support so that reinforcing is approximately in middle of setting bed. Do not butt reinforcing against vertical surfaces.
- D. Thickness of Setting Bed: Approximately 1-3/4 inches.
 - 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

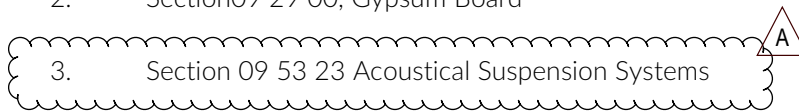
THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 54 26 – SUSPENDED LINEAR WOOD CEILINGS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Concealed suspension system for Wood Grille ceiling panels.
- B. Wood Grille ceiling panels for concealed suspension system.
- C. Trim and accessories.
- D. Seismic restraints for suspended ceiling system.
- E. Related Sections:
 - 1. Section 01 35 42, CALGreen Requirements
 - 2. Section 09 29 00, Gypsum Board



1.2 REFERENCE STANDARDS

- A. ASTM A 641: Standard Specification for Zinc Coated (Galvanized) Carbon Steel Wire; 1992.
- B. ASTM C 423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 1990.
- C. ASTM C 635: Standard Specifications for Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
- D. ASTM C 636: Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 1992.
- E. ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials; 1991.
- F. ASTM E 580: Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint; 1991.
- G. AWI (QSI): Architectural Woodwork Quality Standards Illustrated; 2003.
- H. Cisca: Ceiling Systems Handbook.
- I. California Green Building Standards Code, CALGreen – 2022.

1.3 QUALITY ASSURANCE

- A. Qualifications

1. Manufacturer: Company specializing in manufacture of ceiling panels with five years minimum experience.
2. Installer: Company with three years minimum experience.
- B. Fire Classification Requirements: ASTM E84, flame spread of less than 25 and smoke density rating of less than 450, Class I, California Building Code Table 803.5, 2022 CBC, Tables 8A and 8B.
- C. California Green Building Standards Code, CALGreen – 2022.
- D. All work must pass inspection and approval of architect, as well as the local codes and regulations or authorities having jurisdiction.
- E. Single-Source Responsibility for Wood Ceiling System: Obtain each type of Wood Grille ceiling panels from a single fabricator.
- F. Single-Source Responsibility for Suspension System: Obtain each type of suspension system from a single source.
- G. Conduct a pre-installation conference at Project site to comply with requirements of Section 01.
- D. Space Enclosure and Environmental Limitations: Do not install wood panel ceilings until spaces are enclosed and weatherproof, wet-work in spaces is completed and dry, work above ceilings is complete, and ambient temperature and humidity conditions are being maintained at the levels indicated for Project when occupied for its intended use.

1.4 SUBMITTALS

- A. Product data for ceilings.
- B. Three 12"x18" samples of each color and finish illustrating material and finish of acoustic ceilings.
- C. Manufacturer's installation instructions.
- D. CALGreen Submittals:
 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Code per 1.04.C.
- E. Shop Drawings: Provide Shop Drawings/Coordination Drawings for all ceilings, which should include RCP and product details. Coordinate Wood Grille ceiling panels layout and installation of wood panels and suspension system components with other construction elements that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system components, partition assemblies and all perimeter conditions.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery & Unloading: Coordinate crate sizes, weights, unloading options, and delivery schedule with manufacturer prior to fabrication. Deliver wood panels and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other

mistreatment.

- B. Acclimatization: Before installing wood panels, permit them to reach room temperature and a stabilized moisture content (at least 72 hours) per AWI standards.
- C. Handling: Handle Wood Grille ceiling panels carefully to avoid chipping edges or damaging units in any way.
- D. Protection:
 - 1. Protect completed work above suspension system from damage during installation of suspension system components.

1.6 EXTRA STOCK

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.
 - 1. Wood Grille ceiling panels: Furnish quantity of full-size units equal to 5 percent of amount installed, or one box minimum.
 - 2. Suspension System Components: Furnish quantity of each component equal to 5 percent of amount installed, or one box minimum.

1.7 WARRANTY

- A. Manufacturer: Submit a written warranty executed by the manufacturer, agreeing to repair or replace any materials that fail within the warranty period. Failures include, but are not limited to the following:
 - 1. Installer: All work that fails within the warranty period.
- B. Warranty Period:
 - 1. Wood Ceiling and Grid: One (1) year from date of substantial completion
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Products of the following manufacturers form the basis for design and quality intended.
 - 1. Basis of Design: 9 Wood, Inc., www.9wood.com
- B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.2 MATERIALS

- A. Wood Grille, Series 1100
 - 1. Cross Piece Backer, SKU -1124-3
 - a. Species: Hemlock
 - b. Member Size: 1 3/8" x 3 1/4"
 - c. Edge Profile: Square
 - d. Members/LF: 3 of Members per LF
 - e. Assembly Style: Cross Piece Backer
 - f. Panel Sizes: See architectural RCPs
 - g. Fire Rating: Class 1(A) Fire Rating
 - h. Finish: Clear Interior Finish, Standard Stain or Custom Stain (no mixing colors within panel or layouts)
 - i. Reveal Scrim: None or Black or White Phifer 2360; Max 2-5/8" gap
- B. Metal T-Grid Suspension System: Provide standard interior Metal Heavy Duty 15/16" suspension T-Grid system using Main Runners, Cross-tees, Wall Angle or Shadow Moldings of types, structural classifications, and finishes indicated and that comply with applicable ASTM C 635 requirements. Comply with all applicable codes and ordinances.
- C. Attachment Devices: Size for 3 times the design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- D. Wire, Braces, Ties, Hanger Rods, Flat Hangers and Angle Hangers: Provide wires, rods and hangers that comply with applicable ASTM specifications.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates and structural framing to which ceilings attach or abut, with installer present, for compliance with requirements specified in this and other sections that affect ceiling installation and anchorage. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.
- B. Measure each ceiling area and establish the layout of Wood Grille Panel to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and conform to the layout shown on reflected ceiling plans in accordance with wood ceiling manufacturer's approved Shop Drawings.

3.3 INSTALLATION

- A. Comply with manufacturer's instructions and CISCA "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members per manufacturer's instructions.
- C. Installation of Metal T-Bar Grid: Install, align, brace, tie-off, mount, handle interferences, and space suspension T-Grid in accordance with suspension manufacturer's instructions.
- D. Install ceiling panels in accordance with manufacturer's installation instructions. Install with undamaged edges and fitted accurately to suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit, as required.
- E. Install suspension system runners so they are square and securely interlocked with one another. Install number and use on-center spacing per wood ceiling manufacturer's instructions,
- F. In compliance with all local codes and regulations.

3.4 CLEANING

- A. Clean ceiling panels. Comply with manufacturer's instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

THIS PAGE INTENTIIONALLY LEFT BLANK

SECTION 09 54 36 – SUSPENDED MODULAR CEILING PANELS

PART 1 - GENERAL

1.1 WORK INCLUDES

- A. Suspended Acoustical Softgrid® Modular Ceiling Panels.
- B. Cable hangers and fasteners.
- C. Related Sections:
 - 1. Section 09 29 00, Gypsum Board
 - 2. Section 01 35 42, CALGreen Requirements
 - 3. Section 23, Mechanical
 - 4. Section 26, Electrical
 - 5. Section 28, Fire Alarm

1.2 REFERENCE STANDARDS

- A. Test Methods:
 - 1. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - 2. ASTM E 84/CAN/ULC S102 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 3. CBC – California Building Code, 2022
 - 4. California Green Building Standards Code – 2022.

1.4 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer: Company specializing in manufacture of ceiling panels with five years minimum experience.
 - 2. Installer: Company with three years minimum experience.
- B. Fire Classification Requirements: ASTM E84, flame spread of less than 25 and smoke density rating of less than 450, Class I, California Building Code Table 803.5, 2022 CBC, Tables 8A and 8B.
- C. 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,

- D. Single-Source Responsibility: Provide panels and method of attachment by a single manufacturer.
- E. Coordination of Work: Coordinate ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store the ceiling panels in an interior location and keep in cartons prior to installation to avoid damage.
- B. Exercise care in moving and opening cartons to prevent damage to the panel face.
- C. Handle panels carefully to avoid damaging units in any way.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. All wet work must be complete and dry prior to installation. Installation shall be carried out where the temperature is between 40 degrees F and 90 degrees F. These temperature conditions must be maintained throughout the life of the warranty.

1.7 WARRANTY

- A. Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to:
 - 1. Panels: Manufacturing defects.
 - 2. Attachment devices: Rusting and manufacturing defects.
 - 3. Installer shall warranty all work that fails within the warranty period.
- B. Warranty Period:
 - 1. Panels: One (1) year from date of substantial completion.
 - 2. Attachment devices: One (1) year from date of substantial completion.
 - 3. Workmanship/Installations: One (1) year from date of substantial completion.
- C. Warranty Language:
 - 1. Manufacturer's products are expressly warranted for a period of one (1) year from substantial completion to be free from defects in material and workmanship, when installed according to manufacturer's published installation procedures. During the warranty period manufacturer will repair or at its option replace the products that are proven to be defective. Manufacturer is NOT responsible for any intentional or accidental abuse, misuse, or neglect incurred on the original warranted product, and shall as determined by manufacturer, void the warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: SoftGrid® Switch Series, Arkтура, LLC – 18225 S. Figueroa St. Gardena. CA. 90248 –
P. 310-532-1050
info@arktura.com
- or
- B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.2 MATERIALS

- A. Panels:
1. Surface Texture: Smooth texture
 2. Composition: PET plastic (up to 60% recycled) + Metal brackets
 3. Color: Color to be confirmed by Architect
 4. Panel Size: 7'-6" x 7'-6"
- B. Installation Hardware:
1. 1/32" stainless braided wire, stainless connector plates and Griplock tensioning hardware.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that existing conditions are ready to receive work.
- B. Verify that layout of hangers will not interfere with installation of account units.
- C. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Coordinate panel layout with mechanical, electrical and sprinkler fixtures as required.
- B. Coordinate delivery of such items to project site.
- C. Fit ceiling system in place, free from damaged edges or other defects detrimental to appearance and function.
- D. Fit ceiling system neatly to adjacent surfaces, maintaining clearances.
- E. Install ceiling system level, in uniform plane, and free from twist, and warp. Replace damaged or soiled units.

- F. Provide for complete accessibility for all units.
- G. Install panels in accordance with the manufacturer's instructions and in compliance with the authorities having jurisdiction.
- H. Erect panels level and plumb, in proper alignment in relation to substructure framing and established lines.
- I. Panel anchorage shall be structurally sound and per engineering recommendations.
- J. Locate and place wall panels' level, plumb, and at indicated alignment with adjacent work.
- K. Do not locate the panels in the direct sunlight or sagging from heat and color fade may occur.

3.3 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. Routine maintenance of SoftGrid® panels should consist of: Blot excess spills from material quickly. Wipe with a damp cloth. If stain persists, apply small quantities of carpet or upholstery shampoo solution with a damp cloth. Blot well with a clean cloth after each application of the solution. Warning, avoid excessive amounts of water. Note: Ensure adequate ventilation if the product is likely to be subject to excessive moisture

3.4 WASTE MANAGEMENT

- A. Ceiling systems may be disposed of in standard PET recycling stream provided that no disqualifying foreign matter has been affixed, such as adhesives.
- B. Waste Management:
 - a. Coordinate recycling of waste materials with Section 01 74 19 - Construction Waste Management and Disposal.
 - b. Collect recyclable waste and dispose of or recycle field generated construction waste created during demolition, construction or final cleaning.
 - c. Remove recycling containers and bins from site.

END OF SECTION

SECTION 09 65 45 – VINYL TILE FLOORING – LVT

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glue Down Luxury Vinyl Tile (LVT)
 - 2. Adhesives
- B. RELATED SECTIONS
 - 1. Section 01 35 42, CALGreen
 - 2. Section 03 35 00, Concrete Floor Finishing
 - 3. Section 06 10 00, Rough Carpentry

1.2 REFERENCES

- A. ACI 302.2R - Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
- B. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- E. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- F. ASTM F137 - Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus.
- G. ASTM F141 - Standard Terminology Relating to Resilient Floor Coverings.
- H. NFPA 80 – Fire Safety Code.

1.3 SUBMITTALS

- A. See Section 01 33 00 – Submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

- C. Shop Drawings: Indicate layout of joints.
- D. Samples: Submit two LVT samples illustrating color and pattern design for each LVT color selected.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Installer's Qualification Statement.
- G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- H. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.
- C. Mock-Up:
 - 1. Provide a mock-up for evaluation of product, surface preparation techniques and installation workmanship.
 - 2. Do not proceed with remaining work until size, color, thickness, sheen and workmanship are approved by Architect, End-User and/or other stakeholders.
 - 3. Maintain mock-up area as required in accordance with Care & Maintenance documents to produce acceptable work.

1.5 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
 - 1. Store inside, in well ventilated area, protected from weather, moisture and soiling. Store rolls flat, not standing on end.
- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
- C. Deliver LVT materials in original mill protective wrapping with manufacturers numbers and tags attached.
- D. Ventilate installation area during installation and for 72 hours after installation.
- E. Environmental Conditions: Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer in accordance with product technical data sheets. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.6 WARRANTY

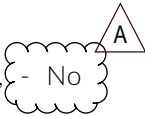
- A. Manufacturers: Provide 10-year Commercial Limited Warranty against defects.

PART 2 – PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. All products used for flooring installation shall comply with flammability and smoke classifications for various locations of installation. Comply with applicable requirements of California Building Code (CBC) Chapter 8.
- B. Provide glue-down installation conforming to CBC Section 11B-302.2.
1. Vinyl Flooring shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad.
 2. Exposed edges shall be fastened to floor surfaces and shall have trim on the entire length.
 - a. Flooring edges shall comply with CBC Section 11B-303.
- C. Comply with CalGreen Building Standards: All installed flooring shall be low VOC emissions listed. Certified as Low Emission by one of the following:
1. Resilient Flooring System shall comply with CALGreen 5.504.4.6

2.2 MANUFACTURERS

- A. Tile Carpeting:
1. Basis of Design Product: District Standards as manufactured by ShawContract, - No substitutions 
 2. ShawContract: shawcontract.com
 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 MATERIALS

- A. Vinyl Tile Flooring - LVT
1. LVT-01: Heavy commercial luxury vinyl tile.
 - a. Basis of Design Product: as manufactured by ShawContract, or approved equal. Abide 
 - b. Class/ASTM F1700: Class III, Type B
 - c. Finish: ExoGuard +
 - d. Thickness: .098 inch
 - e. Nominal Dimensions: 7inch x 47 inches.
 - f. Wear Layer Thickness: 20 mil.
 - h. Edge Profile: Square
 - i. Installation: Direct glue.
 - j. Color: As indicated on Drawings.

2.4 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Edge Strips: By flooring manufacturer. Color as selected by Architect.
- C. Adhesives:
 - 1. Compatible with materials being adhered; maximum VOC content as specified in Section 01 35 42.
- D. Adhesive: Recommended by flooring manufacturer; releasable type.
 - 1. Water-resistant, non-staining and nonflammable type as recommended by carpet manufacturer to be compatible with backing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
 - 1. Maximum variation of 1/8-inch in 10 ft
- B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for 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 flooring material manufacturer and adhesive materials manufacturer.
 - 3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.
- D. Carpet Verification: Verify carpet match before cutting or placement to ensure minimal variation between dye lots.
- E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

3.3 INSTALLATION

- A. Install materials in accordance with manufacturers installation instructions published in AVA RYME technical data sheets.

- B. No traffic, cleaning, finishing or placement of furniture should occur in accordance with adhesive traffic limits published by manufacturer.
- C. Once adhesive has cured, perform initial maintenance in accordance with initial maintenance instructions by manufacturer.

3.4 FINISH APPLICATION

- A. Ensure surfaces have had initial maintenance performed in accordance with initial maintenance instructions by manufacturer.
- B. Clean surfaces thoroughly prior to final use.

3.5 MAINTENANCE

- A. Long-term care and maintenance must be performed in accordance with daily and routine maintenance instructions by manufacturer.

3.6 PROTECTION

- A. Protect installed products until completion of project in accordance with flooring or material protection requirements by manufacturer.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.7 ADDED STOCK

- A. Extra flooring: Quantity equal to 5 percent of total installed but not less than (2) boxes of each color and pattern installed.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 68 13 - TILE CARPETING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Carpet tile, fully adhered.
- B. Carpet tile walk-off mat.

1.2 RELATED REQUIREMENTS

- A. Section 01 35 42 – CALGreen Requirements.
- B. Section 01 74 19 - Construction Waste Management and Disposal.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation.

1.3 REFERENCE STANDARDS

- A. AATCC Test Method 134 - Electrostatic Propensity of Carpets.
- B. AATCC Test Method 16 - Colorfastness to Light.
- C. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
- D. ASTM D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings.
- E. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- F. CRI 104 - Standard for Installation of Commercial Carpet.
- G. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

1.4 SUBMITTALS

- A. See Section 01 33 00 – Submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Shop Drawings: Indicate layout of joints.
- D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- E. Submit two, 6 inch long samples of edge strip and base cap.
- F. Manufacturer's Installation Instructions: Indicate special procedures.

- G. Installer's Qualification Statement.
- H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, 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.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.6 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
 - 1. Store inside, in well ventilated area, protected from weather, moisture and soiling. Store rolls flat, not standing on end.
- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
- C. Deliver carpet materials in original mill protective wrapping with mill register numbers and tags attached.
- D. Ventilate installation area during installation and for 72 hours after installation.

1.7 WARRANTY

- A. Carpet Warranty: Provide 10-year Commercial Limited Warranty.
- B. Extended Warranty: Provide extended warranty covering edge raveling, delamination and wear exceeding 10 percent of face yarn weight for a period of 15 years after "Notice of Completion".

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. All products used for flooring installation shall comply with flammability and smoke classifications for various locations of installation. Comply with applicable requirements of California Building Code (CBC) Chapter 8.
- B. Provide glue-down installation conforming to CBC Section 11B-302.2.
 - 1. Carpet shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad.

- a. Carpet shall have level loop, textured loop, level cut or level cut/uncut pile texture.
 - b. Pile height shall be 1/2 inch maximum.
- 2. Exposed edges shall be fastened to floor surfaces and shall have trim on the entire length.
 - a. Carpet edges shall comply with CBC Section 11B-303.
- C. Comply with CalGreen Building Standards: All installed carpeting shall be low VOC emissions listed. Certified as Low Emission by one of the following:
 - 1. Carpet and Rug Institute's Green Label Plus Program. CalGreen 5.504.4.4.1
 - 2. Compliant with the VOC emission limits and testing requirements specified in the California Department of Public Health's "Standard Method for the Testing and Evaluation Chambers", Version 1.2, January 2017 or Specification 01350. CalGreen 5.504.4.4.2.
 - 3. NSF/ANSI 140 at Gold level or higher. CalGreen 5.504.4.4.3
 - 4. SCS Floorscore; www.scs-certified.com. CalGreen 5.504.4.4.4.
 - 5. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; www.chps.net/manual/lem_table.htm. CalGreen 5.504.4.4.5.

2.2 MANUFACTURERS

A. Tile Carpeting:

- 1. CPT-01: Basis of Design Product: District Standards as manufactured by ShawContract, - No substitutions 
- 2. ShawContract: shawcontract.com
- 3. CPT-02: Basis of Design Product: District Standards as manufactured by Tandus, Tarkett – No Substitutions 
- 4. Tarkett: https://professionals.tarkett.com.au/en_AU/
- 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 MATERIALS

A. Carpet Tile

- 1. Carpet, Type CPT-01: Multi-Level Pattern Loop.
 - a. Basis of Design Product: Kindred (ST263) as manufactured by ShawContract, or approved equal. 

- b. Radiant Panel: Class 1.
- c. Surface Flammability Ignition: ASTM D2859.
- d. Thickness: .212 inch.
- e. Primary Backing:
 - 1) Material: Synthetic.
 - 2) Ecoworx Tile.
- f. Tile Size: 24 inch x 24 inch, nominal.
- g. Stitches: 9.0 per inch.
- h. Gauge: 1/10 inch
- i. Pile Height: .085 inch.
- j. Density Average 8047 oz/yd³
- k. Color: As indicated on Drawings.

2. Carpet Tile – Walk Off Type CPT-02; Patterned loop

- a. Basis of Design Product: Abrasive Action II (02578) as manufactured by Tandus, Tarkett
- b. Tile Size: 24 inch x 24 inch, nominal.
- c. Thickness: 0.314 inch.
- d. Color: Charcoal 19100
- e. Radiant Panel: Class 1.
- f. Surface Flammability Ignition: ASTM D2859.
- g. VOC Content: Comply with CALGreen 01 35 42.
- h. Gauge: 1/12 inch.
- i. Pile Height: .123 inch.
- j. Density Average: 24 oz/yd²
- k. Primary Backing Material: Non-woven synthetic fiber
 - 1) Synthetic Non-Woven
 - 2) ETHOS MODULAR

3. Preferred Manufacture Location: California.

4. Recycling:

- a. New Carpet:
 - 1) Carpet must be eligible for recycling by the supplying mill or fiber producer to an existing operational third party certified recycling center;
 - 2) Submit program parameters.
 - 3) Landfills are not an option.

2.4 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Edge Strips: Rubber, color as selected by Architect.

C. Adhesives:

- 1. Compatible with materials being adhered; maximum VOC content as specified in Section 01 35 42.

- D. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.
 - 1. Water-resistant, non-staining and nonflammable type as recommended by carpet manufacturer to be compatible with backing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
 - 1. Maximum variation of 1/8-inch in 10 ft
- B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for 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 flooring material manufacturer and adhesive materials manufacturer.
 - 3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.
- D. Carpet Verification: Verify carpet match before cutting or placement to ensure minimal variation between dye lots.
- E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

3.3 INSTALLATION

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions and CRI 104 (Commercial).
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
 - 1. Locate change of color or pattern between rooms under door centerline.
- F. Locate change of color or pattern between rooms under door centerline.

- G. Fully adhere carpet tile to substrate.
- H. Trim carpet tile neatly at walls and around interruptions.
 - 1. Edges: Run carpet under open bottom items and all cabinets and install tight to walls. Neatly trim and secure edge of carpet adjacent to door jambs where no base occurs.
- I. Complete installation of edge strips, concealing exposed edges.
- J. Carpet Finishing: Brush all seams and trim protruding pile tufts level. Remove excess adhesive on the carpet surface and thoroughly vacuum entire area. Leave room clean and ready for use.

3.4 PROTECTION

- A. Cover carpet during construction period with reinforced kraft paper when construction traffic is required to cross carpeted areas.
- B. Remove and replace damaged or improperly installed carpet.

3.5 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.
 - 1. Vacuum and remove all stains from carpet to satisfaction of District and in accordance with cleaning specified in Section 01 70 00 - Execution and Closeout Requirements.

3.6 ADDED STOCK

- A. Extra Carpet Tiles: Quantity equal to 5 percent of total installed but not less than (2) boxes of each color and pattern installed.

END OF SECTION

SECTION 09 80 00 - ACOUSTICAL WALL PANELS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

Drawings and General Conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

A. Section Includes:

1. Acoustical Wall Panels

B. Related Sections:

1. Division 23 Sections - HVAC
2. Division 26 Sections - Electrical

1.3 REFERENCES

A. Test Methods:

1. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
2. ASTM E 84/CAN/ULC S102 Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide panels and method of attachment by a single manufacturer.

B. Coordination of Work: Coordinate work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, plumbing systems, and electrical systems.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store the acoustical sheets in an interior location and keep in cartons prior to installation to avoid damage.
- B. Exercise care in moving and opening cartons to prevent damage to the panel face.
- C. Handle panels carefully to avoid damaging units in any way.

1.6 PROJECT CONDITIONS

- A. Space Enclosure:
 - 1. Acoustical Panels: All wet work must be complete and dry prior to installation. Installation shall be carried out where the temperature is between 40 degrees F and 90 degrees F. These temperature conditions must be maintained throughout the life of the warranty.

1.7 WARRANTY

- A. Acoustical Panels: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to:
 - 1. Panels: Manufacturing defects.
 - 2. Attachment devices: Rusting and manufacturing defects.
- B. Warranty Period:
 - 1. Panels: One (1) year from date of substantial completion.
 - 2. Attachment devices: One (1) year from date of substantial completion.
- C. Warranty Language:
 - 1. Manufacturer's products are expressly warranted for a period of one (1) year from purchase to be free from defects in material and workmanship, when installed according to manufacturer's published installation procedures. During the warranty period manufacturer will repair or at its option replace the products that are proven to be defective. Manufacturer is NOT responsible for any intentional or accidental abuse, misuse, or neglect incurred on the original warranted product, and shall as determined by manufacturer, void the warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Arktura LLC (Basis of Design)
- B. Or Approved Equal

2.2 PANEL UNITS

- A. Panels:
 - 1. Surface Texture: Solid – see architectural drawings
 - 2. Composition: PET plastic (up to 60% recycled)
 - 3. Color: Soft Sound Wood Texture, Golden Oak
 - 4. Panel Size: As indicated on drawings

2.3 ATTACHMENT SYSTEM

- A. Installation Hardware:
Direct mount with construction adhesive to be provided by installer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Field verify each wall area and establish layout of panels. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation. Panel substructure shall be level and plumb. Panel substructure shall be structurally sound as determined by that subcontractor's engineer. Panel substructure shall be free of defects detrimental to work and erected in accordance with established building tolerances.
- B. Coordinate panel layout with mechanical, electrical and sprinkler fixtures as required.
- C. Coordinate delivery of such items to project site.

3.2 INSTALLATION [by Others]

- A. Install panels in accordance with the manufacturer's instructions and in compliance with the authorities having jurisdiction.
- B. Erect panels level and plumb, in proper alignment in relation to substrate and established lines.
- C. Panel anchorage shall be structurally sound and per engineering recommendations.

- D. Locate and place wall panels' level, plumb, and at indicated alignment with adjacent work.
- E. Do not locate the panels in the direct sunlight or sagging from heat and color fade may occur.

3.3 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. Routine maintenance acoustical panels should consist of: Blot excess spills from material quickly. Wipe with a damp cloth. If stain persists, apply small quantities of carpet or upholstery shampoo solution with a damp cloth. Blot well with a clean cloth after each application of the solution. Warning: avoid excessive amounts of water. Note: Ensure adequate ventilation if the product is likely to be subject to excessive moisture

3.4 WASTE MANAGEMENT

- A. Waste Management:
 - 1. Coordinate recycling of waste materials with Section [01 74 19 - Construction Waste Management].
 - 2. Collect recyclable waste and dispose of or recycle field generated construction waste created during demolition, construction or final cleaning.
 - 3. Remove recycling containers and bins from site.

END OF SECTION

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.
- H. Product / material submittals shall be identified as to what application the product / material is to be applied.

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.
 - 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 from 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 material product and applications – surface finishes 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. Sand 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 Tnemec 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. Do not paint labels, leave intact and readable.

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 Coat4800 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

3.09 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

SECTION 09 90 00
PAINTING

- a. Primer, 1 Coat Amercoat L69 B58-620 Carbomastic 203V 385 15
- b. Finish, 2 Coats Americhield 1080 B65-625 Carbothane 379 H 134 MC

- 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

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 10 14 33 - EXIT SIGNAGE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Self-Luminous Exit Signage.
- B. Tactile Exit Signs.



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
 - 1. ADA Standards - ADA Title II Regulations and the 2010 ADA Standards for Accessible Design.
- C. CBC - 2022 California Building Code
 - 1. Chapter 11B, Accessibility for Public Buildings, Public Accommodations, Commercial Facilities and Publicly Funded Housing
- D. UL 924 - Emergency Lighting and Power Equipment.

1.3 SUBMITTALS

- A. Shop drawings listing sign styles, lettering and locations and overall dimensions of each sign.
- B. Two samples illustrating full size sample sign, of type, style and color specified including method of attachment. If accepted, samples may be installed in project.
- C. Manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements for Tactile Exit Signs
 - 1. Conform to CBC for accessibility provisions, CBC 1013.4, 11B-703.1, 11B-703.2, 11B-703.3, 11B-703.4 and 11B-703.5.
 - 2. Signage Requirements
 - a. Character Proportions: Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase "I", 11B-703.2.4. Stroke thickness of the uppercase letter "I" shall be 15% maximum of the height of the character. All letters measured must be uppercase.
 - b. Line Spacing: Spacing between the baselines of separate lines of raised characters within a message shall be 135% minimum and 170% maximum of the raised character height.
 - c. Finish and contrast: Characters and their background shall have a

non-glare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background, 11B-703.5.1.

- d. Characters and symbols shall contrast in color or image with either light letters on dark background or dark letters on light background, and shall be raised minimum 1/32 inch.
 - e. Minimum height for raised characters or symbols: 5/8 inch minimum and 2 inches maximum, uppercase.
 - f. Braille: California (Contracted) Grade 2 Braille. Dot base diameter shall be 0.059 inch to 0.063 inch. Dots shall be 0.100 inch on center in each cell with 0.300 inch space between corresponding dots in adjacent cells. Distance between corresponding dots from one cell directly below, 0.395 to 0.400 inch. Dots shall be raised 0.025 to 0.037 inch above the background.
Braille dots shall be domed or rounded.
- B. Pre-installation Conference: Notify Architect when signs are ready for installation. Arrange for conference at site. Do not proceed with installation until Architect's approval of specific locations and methods of attachment has been obtained.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site and protect from damage. Store until immediately prior to Notice of Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of following manufacturers form basis for design and quality intended.
 - 1. Evenlite, Bensalem, PA.
 - 2. Active Safety, Murray, UT
 - 3. Safe Glow Corp, Yorba Linda, CA
 - 4. Self-Powered Lighting Inc., Berwyn, PA
 - 5. Isolite Corporation, San Luis Obispo, CA
- B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.2 REGULATORY REQUIREMENTS

- A. Exit Sign shall be illuminated at all times.
- B. Self-Luminous Signs: CBC Section 1013.5.

2.3 EMERGENCY EXIT SIGNS

- A. Conform to CBC for accessibility provisions, CBC 1013.5.
- B. Self-Luminous Exit Signs: UL 924 Listed, minimum luminance, 0.06 foot lambert. Non

electric, internally illuminated by sealed tritium gas light source.

1. Surface Mounted Wall Signs:
 - a. Low and High Level Exit Signs - Wall: Evenlite Slimline SL Series, green illuminating letters, stenciled brush aluminum face plate with SELF-LUMINOUS TEXT. Finish: brushed aluminum, 8-1/4"H x 12-3/4"L x 3/4" thick, single face, one type of sign at each exit door.

2.4 TACTILE EXIT SIGNS

- A. Conform to Sections 1013.4, 11B.703.1, 11B.703.2, 11B.703.3, 11B.703.4 and 11B.703.5, CBC 2022.
- B. Install sign at each exit door as conditions required in CBC Section 1013.4 CBC:
 1. Each grade-level exterior exit door shall be identified by a tactile exit sign with the word, "EXIT".
 2. Each exit door that leads directly to a grade-level exterior exit by means of a stairway or ramp shall be identified by a tactile exit sign with the following words as appropriate:
 - a. "EXIT STAIR DOWN"
 - b. "EXIT RAMP DOWN"
 - c. "EXIT STAIR UP"
 - d. "EXIT RAMP UP"
 3. Each exit door that leads directly to a grade-level exterior exit by means of an exit enclosure that does not utilize a stair or ramp, or an exit passageway shall be identified by a tactile exit sign with the words, "EXIT ROUTE".
 4. Each exit access door from an interior room or area that is required to have a visual exit sign, shall be identified by a tactile exit sign with the words, "EXIT ROUTE".
 5. Each exit door through a horizontal exit shall be identified by a tactile exit sign with the words "TO EXIT".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Beginning of installation means installer accepts existing surfaces.
- C. Code-required signs shall be field-inspected per CBC 11B-703.1.1.2.

3.2 INSTALLATION

- A. Install signs only after surfaces are finished at exit locations.
- B. Installation:
 1. Concealed mounting: Install with manufacturer's attachment.

2. Exposed mounting: Install with minimum four (4) stainless steel flathead screws, tamper-proof.
countersunk
- C. Low and High level mountings as indicated on Drawings and comply with of Section 1013.8 CBC.
 1. Low level signs: Install not less than 6 inches or more than 8 inches above finish floor to the bottom of sign, install the closest edge of sign within 4 inches of door frame.
- D. Clean and polish.

END OF SECTION

SECTION 10 22 33 – FOLDING PANEL PARTITIONS

PART 1 - GENERAL

1.1 WORK INCLUDES

- A. Furnish and install operable partitions and suspension system in compliance with the architectural drawings and specifications contained herein.
- B. Related Sections:
 - 1. Section 01 35 42, CALGreen Requirements
 - 2. Section 06 10 00, Rough Carpentry
 - 3. 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. CBC - California Building Code, 2022.
- C. California Green Building Standards Code, CALGreen - 2022.
- D. ASTM E 90: Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions
- E. ASTM E 413: Determination of Sound Transmission (STC).
- F. ASTM E 557: Standard Practice for Architectural Application and Installation of Operable Partitions
- G. ASTM E 84: Surface Burning Characteristics of Building Materials.
- H. ASTM A 653: Specification for General Requirements for Steel Sheet, Alloy-Coated (Galvanneal) by the Hot Dip Process.
- I. ASTM C 423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room method.
- J. CCC-W-408A: Federal Specification which applies to Vinyl Coated Wall Coverings.
- K. CFFA-W-101-D: Chemical Fabrics and Film Association Quality Standard for Vinyl Coated Fabric Wall Coverings.
- L. ASTM E 2190: Certification and Testing for Insulated Glass inserts.
- M. Rack testing for 10 years. (tensional strength stress test)
- N. The manufacturer shall have a quality system that is registered to the ISO 9001 standards.

1.3 SUBMITTALS

- A. Complete shop drawings are to be provided prior to fabrication indicating construction and installation details. Shop drawings must be submitted within 60 days after receipt of signed contract.
- B. Product Data for partition door.
- C. Shop drawings indicating construction and details.
- D. CALGreen Submittals
 - 1. Product Data Sheets and Declaration Statements showing compliance with CALGreen Submittals.

1.4 QUALITY ASSURANCE

- A. Qualifications
 - 1. Manufacturer: Company specializing in manufacture of ceiling panels with five years minimum experience.
 - 2. Installer: Company with three years minimum experience.
- B. Fire Classification Requirements: ASTM E84, flame spread of less than 25 and smoke density rating of less than 450, Class I, California Building Code Table 803.5, 2022 CBC, Tables 8A and 8B.
- C. California Green Building Standards Code, CALGreen – 2022.

- D. The operable wall shall have been tested in an independent acoustical testing laboratory in accordance with ASTM E 90 and ASTM E 413 test procedures.
- E. The operable wall panel construction and finish materials shall consist of Class A rated materials (except as noted, under "Finishes" Part 2 Products) in accordance with ASTM E 84.
- F. The operable wall shall be installed by the manufacturer's authorized distributor in accordance with ASTM E 557.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Proper storage of partitions before installation and continued protection during and after installation will be the responsibility of the General Contractor.
- B. Panels shall be individually wrapped in a protective plastic covering to keep panels clean during delivery, storage and handling.
- C. Panels shall be stored on edge and above the floor on cushioned blocking in a dry and ventilated area, protected from humidity and temperature extremes.

1.6 WARRANTY

- A. Manufacturer shall warrant each operable wall panel and its component parts to be free from defects in material and workmanship for a period of five (5) years from the date of delivery to the original purchaser, when installed by an authorized KWIK-WALL distributor. KWIK-WALL also warrants the fixed top seals, track, carriers, and its component parts to be free from defects in material and workmanship for a period of ten (10) years. (Contact your local KWIK-WALL Distributor or KWIK-WALL Company for complete warranty information.) (Glass is specifically excluded from the warranty.)

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of the following manufacturers form the basis for design and quality intended.
1. Basis of Design: Operable Wall, Series 2000, Model 2030GL Hinged Pairs, Manufactured by KWIK-WALL Company. <https://kwik-wall.com/>
- B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.2 MATERIALS

- A. Basis of Design: Operable Wall, Series 2000, Model 2030GL Hinged Pairs
1. Panel Dimensions: Standard panel dimension shall be nominal 3" [76] thick
 2. Panel Skins: Panel Skins shall be Class A rated in accordance with ASTM E 84. Panel Skin material shall consist of:
 - a. Standard Acoustical Substrate: Consisting of structural acoustical substrate pressure laminated to both sides of the steel frame to form a rigid, unitized and structural panel.
 3. Optional Glass (2030GL): Opening cut out in panel shall be glazed with insulated glass that is manufactured in accordance with ASTM E 2190. Glass type shall be acoustical insulated glass unit 1- 3/4" thick with 1" air space. Glass shall be retained in opening cut out using an aluminum extrusion.
 4. Panel Frame: Vertical steel frame members shall be minimum 18-gauge galvanized steel, horizontal top cross member shall be minimum 12-gauge galvanized steel, which meets or exceeds ASTM A 653 requirements. Frame shall be all-welded construction with steel corner supports and cross-bracing reinforcements. Panel frame shall be Class A rated fire retardant, non-combustible and non-corrosive in accordance with ASTM E 84
 5. Panel Hinges: Panel Hinges Shall be:
 - a. Architectural grade, full leaf butt hinges. Hinges shall be attached to the steel frame of the panel and reinforced with a steel backer plate.

6. Vertical Trim and Seals: Panels shall have vertical astragals containing flexible vinyl seals and incorporate reversible tongue-and-groove type configurations for positive interlocking with adjacent panels. Vertical astragal type shall be:
 - a. Standard Trimless Astragal: Consisting of an aluminum extrusion with tongue-and-groove type vertical astragals. Vertical trim shall not be permitted on the panel faces, resulting in a minimal groove appearance between adjacent panels.
7. Horizontal Top Trim and Seals: Top Seals shall consist of flexible vinyl sweep seals installed on both sides of the panel. The seals shall consist of a compressed bulb between two (2) fingers of vinyl. Top seal type shall be:
 - a. Standard Fixed Top Seals: consisting of continuous-contact flexible vinyl sealing against the bottom flange of the overhead track.
8. Horizontal Bottom Trip and Seals: Bottom Seals shall consist of multiple fingers of flexible vinyl for positive contact and sealing with various floor surfaces. Bottom seal type shall be:
 - a. Optional Adjustable Bottom Seals: consisting of field-adjustable, continuous-contact vinyl sweep seals with 2" [50.8] nominal height with ¾" [19] of nominal adjustment.
9. Horizontal and Vertical Panel Trim: All exposed panel trim and hinges shall be of one (1) similar color:
 - a. Grey
- B. Panel weight: Maximum panel weight shall be 7.55lb/ft² .
- C. Suspension system:
 1. Mounting systems: The track will be supported by:
 - a. Standard Drop Rod Mount: consisting of adjustable rods of grade 2, 3/8" [10] diameter threaded steel all rod provided with 3/8" [10] serrated steel nuts.
- D. Carrier System:
 1. Carrier type: Each Hinged Pair panel shall be top supported by one (1) carrier utilizing a 5/8" [16] diameter pendant bolt. The carrier type shall be:
 - a. Type 425 Polymer Tire Carrier: consisting of four (4) permanently lubricated, precision ball bearing steel wheels with high strength polymer tires, as required for smooth and quiet operation.
 2. Carrier Size: The carrier size shall be:
 - a. Type 425 Hinged Pairs Polymer Tire Carrier: certified to be capable of supporting up to 525 lb. (238 kg) of total live load weight per panel.

- E. Tract System:
1. Track Type: The operable wall track system shall be:
 - a. Standard Hinged Pairs Aluminum Track: extruded from structural aluminum allow, which prohibits deterioration caused by rust or corrosion. The aluminum track shall have a durable anodized clear satin finish, which resists color fading and flaking. The track shall utilize grooves and interlocking steel pins for positive alignment of adjacent track sections. The track joints shall be reinforced overhead by a heavy-duty steel bracket made of hot-rolled, 3/8" [10] thick plate steel. Aluminum track shall include an integral nut slot to accept a hardened steel square nut to facilitate attachment of each steel all-rod and splice brackets to the overhead structural support.
 2. Track Size: The track size shall be:
 - a. Type 425 Hinged Pairs Aluminum Track: certified to be capable of supporting up to 525 lb. (238 kg) of total live load weight per panel.
- F. Finishes
1. Finish Material Type: Panel finish material shall be Class A rated in accordance with ASTM E 84, consisting of:
 - a. Optional Upgrade Fabric: consisting of fade and tear resistant fabric that resists water based stains weighing 13 oz./lin.yd. (403 g/lin. m).
 2. Finish Material Supplier: Finish material shall be:
 - a. Standard Factory Supplied: from manufacturer standard selection of finish materials, as specified.
 3. Finish Material Application: Finish material shall be:
 - a. Standard Factory Applied: by operable wall manufacturer.
 4. Finish Selection Shall be:
 - a. Altai, Triton 116-10
- G. Available Accessories/Options:
1. Accessories including pocket doors shall be compatible with other accessories and options, furnished and installed by the operable wall manufacturer as noted on submitted shop drawings.

2.3 OPERATION

- A. Panels shall be manually moved from the storage area, positioned in the opening, and seals set.
- B. Operation shall be Hinged Pairs, consisting of panels hinged together in groups of two (2), unless otherwise specified. Panels shall be top supported by one (1) carrier in each panel.

C. Closure Systems:

1. Initial Closure System: The lead panel (the first panel exiting the stack) shall form a seal vertically against the rigid wall surface, as accomplished by:
 - a. Standard Bulb Seal: consisting of continuous-contact, flexible vinyl bulb seals installed along the vertical edge of the lead panel for positive compression against the rigid wall surface.
2. Final Closure System: The final closure panel (the last panel exiting the stack) shall form a seal vertically against a rigid wall surface. The type of final closure panel shall be:
 - a. Standard Expander Panel Closure: Consisting of an expander mechanism with a nominal 5" [127] of travel, activated from the face of the panel using a removable wrench as supplied by manufacturer. The expander panel shall be equipped with an adjustable bottom seal and a flush pull handle.
 - b. System shall seal to the face of the pocket door.

D. Stack Arrangements:

1. Stack Type: Panel Storage configuration shall be center stack, consisting of panels stacked on center to the walls installed position.
2. Stack Quantity: Panels shall be stored at:
 - a. Standard One End: on one end of the wall run inside a pocket with pocket doors.

2.4 ACOUSTICAL PERFORMANCE

- A. Certification: The operable wall shall have been tested in an independent acoustical testing laboratory in accordance with ASTM E 90 and ASTM E 413 test procedures.
- B. STC Rating: The operable wall acoustical performance rating shall be based on:
 1. Optional glass insert (2030GL): with a standard rating of 38 STC.
- C. Complete, unaltered written test report is to be made available upon request.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Proper and complete preparation of the operable wall system opening shall be by others in accordance with the architectural drawings, manufacturers shop drawings and ASTM E 557. Any deviation of the actual opening from these specifications shall be called to the attention of the architect prior to the installation of the operable wall.
- B. Deficiencies in the operable wall opening shall be corrected by others prior to installation of the operable wall.

3.2 INSTALLATION

- A. The operable wall system shall be installed by manufacturers authorized distributor.
- B. The operable wall shall be installed in accordance with manufacturers written instructions, shop drawings, and ASTM E 557 installation guidelines.

A

3.3 CLEANING

- A. All track and panel surfaces shall be wiped clean and free of handprints, grease, and soil.
- B. Cartoning and other installation debris shall be removed to onsite waste collection area, provided by others.
- C. The operable wall panels shall be stored in the stacked (retracted position prior to acceptance by the owners representative.

3.4 TRAINING

- A. Installer shall demonstrate proper operation and maintenance procedures to owner's representative.
- B. Operating handle and owners manuals shall be provided to owner's representative.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 10 26 17 – WALL PROTECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Corner Guards.

1.2 REFERENCE STANDARDS

- A. Conform to reference standards by date of issue current on date of Contract Documents.
- B. ASTM E84 - Surface Burning Characteristics of Building Materials.
- C. CBC - Chapter 16, 2022 California Building Code.

1.3 PERFORMANCE REQUIREMENTS

- A. Corner guards shall resist lateral impact force of 100 pounds at any point without permanent damage.

1.4 SUBMITTALS

- A. Product Data showing physical dimensions, features, wall mounting brackets with mounting measurements, anchorage details and rough-in measurements.
- B. Three samples of units specified illustrating component design, configuration, color and finish.
- C. Manufacturer's Installation Instructions: Indicate installation rough-in measurements and instructions.
- D. Maintenance data for wall protection system components for inclusion in the operating and maintenance manuals specified in Division 1.

1.5 QUALITY ASSURANCE

- A. Conform to CBC for accessibility provisions.
- B. Required Maximum Flame Spread, All Materials: Less than 25. Maximum smoke density: 450, ASTM E84.
- C. Installer qualifications: Engage an installer who has no less than 3 years' experience in installation of systems similar in complexity to those required for this project.
- D. Manufacturer's qualifications: Not less than 5 years' experience in the production of specified products and a record of successful in-service performance.

1.6 FIELD MEASUREMENTS

- A. Verify field measurements.

1.7 COORDINATION

- A. Coordinate Work with wall or partition sections for installation of concealed blocking or anchor devices.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer.
- B. Store materials in original, undamaged packaging in a clean, dry place out of direct sunlight and exposure to the elements. A minimum room temperature of 40°F (4°C) and a maximum of 100°F (38°C) should be maintained.
- C. Materials must be stored flat.

1.9 PROJECT CONDITIONS

- A. Materials must be acclimated in an environment of 65-75°F (18-24°C) for at least 24 hours prior to beginning the installation.
- B. Installation areas must be enclosed and weatherproofed before installation commences.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of following manufacturers form basis for design and quality intended.
 - 1. Vinyl/Acrylic
 - a. Construction Specialties, Inc., San Marcos, CA
- B. Or equal as approved in accordance with Division 01, General Requirements for substitutions.

2.2 MATERIALS

- A. Cover Material: 0.078 inch thick Vinyl/acrylic matte finish surface, supported by aluminum retainer designed to withstand impact without damage to assembly or to wall to which it is attached. Units shall be mounted using concealed fasteners supplied by manufacturer.
- B. Engineered PETG: Rigid sheet high impact Acrovyn 4000 with nominal .060" (1.52mm) thickness, 4' x 8' or 10' sheet sizes in Suede texture.
- C. Units shall be identified with appropriate UL rating.

2.3 COMPONENTS

- A. Corner Guards: Construction Specialties C/S Model SM-20N, Acrovyn 4000, 90 degree guard. Engineer PETG (polyethylene Terephthalate glycol) Corner Guards: 3 inch legs, Acrovyn surface mounted, bottom and top caps, aluminum retainers; Projecting maximum 1/2 inch from wall to outside of guard.
- B. Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.
- C. Provide continuous inside and outside corners and preformed end caps at terminations.

2.4 FABRICATION

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.
- C. Form end trim closure by capping and finishing smooth.

2.5 FINISHES

- A. Colors as selected from manufacturer's standard list in standard pattern surface.
- B. Surface Finish: Stainless Steel



PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions.
- B. Verify that rough-in for components are correctly sized and located.
- C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface preparation: Prior to installation, clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.
- B. Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.

3.3 INSTALLATION

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position.
- B. Position corner guard from TOP OF BASE to 48 inches high, unless noted otherwise.

3.4 CLEANING

- A. Clean wall surfaces and corner guards.

3.5 PROTECTION

- A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 11 52 23 – AUDIO-VISUAL EQUIPMENT SUPPORTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: LCD display mounts for multi display wall.

1.2 ACTION SUBMITTALS

- A. Refer to Section 01 30 00 Administrative Requirements.
- B. Product Data: For each LCD display mount, including manufacturer recommended installation procedures.
- C. Shop Drawings: Include dimensions, method of attachment, structural and seismic support.
- D. Coordination Drawings: Provide drawings and information indicating coordination between LCD Displays and display mounts.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 01 60 00 Product Requirements.
- B. Deliver LCD display mounts in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Inspect for freight damage, concealed or otherwise, upon delivery to project site. Report damage to freight carrier immediately for replacement of LCD display mounts.

1.4 WARRANTY

- A. Manufacturer lifetime warranty against manufacturing defects.

PART 2 - PRODUCTS

2.1 BASIS OF DESIGN

- A. Crimson Unistrut Video Wall Mount, VWG3U
 - 1. Subject to compliance with requirements, manufacturers of products of equivalent design may be acceptable if approved in accordance with Section 01 30 00 Administrative Requirements.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Bracing: Design LCD display mount support to resist the effects of earthquake motion in accordance with Seismic Design Category as indicated on Drawings.

2.3 LCD DISPLAY MOUNTS

- A. Display mount for LCD displays. Each mount attaches a single display to the wall.
 - 1. Distance from wall: 4.10" min. to 7.05" max. (104.1 to 179.1 mm) to back of display.
 - 2. Fine adjustment to height and depth positioning, allowing edge to edge multi-display mounting.
- B. Mount assembly includes:
 - 1. Multi Display Wall Rails: high grade rolled steel wall rail and two (2) end caps per rail
 - a. Rail Length: 36 inches (914.4 mm) each
 - b. Finish: scratch resistant epoxy powder coat
 - 2. Display attachment hardware.
 - a. Mounting pattern: Suitable for VESA standard.
- C. Display characteristics
 - 1. Maximum display weight: 150 lb (68 kg) per mount assembly.
 - 2. Display size: 55"

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate layout and installation with wall construction and related components penetrating walls such as lighting fixtures.
- B. Coordinate requirements for blocking, structural and seismic supports, and bracing to ensure proper installation of Video Wall Mounts and LCD displays.
- C. Coordinate location and requirements for power supply conduit, and wiring required for LCD displays.

3.2 INSTALLATION

- A. Install LCD Display mounts at locations and heights indicated on Drawings.
- B. Utilize necessary hardware, anchors, brackets and fasteners; according to manufacturer's written instructions and as specified.

SECTION 11 52 23
AUDIO-VISUAL EQUIPMENT SUPPORTS

- C. LCD Display mounts to be installed square and level, and without gaps between LCD Display.

3.3 FIELD QUALITY CONTROL

- A. Verify equipment supports are installed securely to substrate and within tolerances recommended by manufacturer.
- B. Correct deficiencies.

3.4 PROTECTION

- A. Protect LCD Display Mounts after installation from damage during remainder of construction. In the event of damage, remove and replace damaged component or entire unit as required to provide units in their original, undamaged condition.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 22 05 00 – PLUMBING GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. General requirements applicable to all Division 22 Sections.

1.2 DEFINITIONS

- A. A/E: Project Architect and/or Engineer.
- B. Furnish: To purchase/supply.
- C. Install: To place in position and connect complete ready for use.
- D. Provide: To furnish and install.

1.3 GENERAL

- A. The contract drawings are a diagrammatic representation of the design intent. They do not show every component required for a complete and operational system. The Contractor shall install complete and operational systems based on the design intent.
- B. The installation shall comply with the contract documents, applicable codes, manufacturer's installation recommendations, published Owner standards, utility company requirements, and requirements of the AHJ.
 - 1. Notify the A/E in writing of any discrepancies in the contract documents and any of the authorities listed above prior to submitting a bid.
 - 2. If there is a discrepancy between manufacturer's installation recommendations and the contract documents, the manufacturer's recommendations shall take precedence.
 - 3. If there are conflicting requirements in the contract documents, the more restrictive requirement shall govern.
- C. Contractor shall apply, procure, and pay for required permits, licenses, inspections, utility service connections (including meters), and any other fees.

1.4 EXAMINATION OF CONTRACT DOCUMENTS

- A. The drawings show the design intent diagrammatically. They do not show the exact routing nor every elbow, offset, etc. Do not scale the drawings. The Contractor shall determine the exact installed locations and routing to achieve the design intent. The cost of reasonable adjustments to locations and routing shall be included in the bid. The Contractor shall visit the project site prior to submitting a bid to confirm existing conditions and new work plan of action.
- B. Where discrepancies in quantities or sizes exist in the contract documents the greater number shall govern.
- C. Verify all dimensions at the jobsite prior to ordering any materials.

1.5 SUBMITTALS

- A. Submittals shall be required if requested in applicable specification section or drawings. Submittals will not be reviewed by engineer for specific products if they are not requested in the contract documents.
- B. Contractor shall provide separate submittal packages for each specification section. Submittals including multiple specification sections are not acceptable. All items within an individual specification section shall be provided within a single submittal. Providing multiple submittals for a single specification section is not acceptable unless the project has multiple phases.
- C. Submittals shall be in PDF format. File name shall include the specification number and description of the submitted item.
- D. Content Requirements:
 - 1. Each submittal shall include a cover sheet containing date, project name and number, contractor's name and address, specification number, items submitted, deviations from contract documents, and a blank space for review stamps.
 - 2. Submitted items that have a scheduled equipment tag number on the contract documents shall bear such tag number in the submittal to clearly identify submitted item.
 - 3. Selected options such as model, material, finish, etc. shall be clearly identified.
 - 4. Contractor shall provide review stamp on each submittal, including name of reviewer and date, indicating the content in the submittal has been thoroughly reviewed for completeness and accuracy prior to submitting.
 - 5. Clearly identify deviations, if any, from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.
- E. Submittals shall be approved by the A/E prior to ordering items. Approval of submittals does not relieve the contractor's obligation to comply with the contract documents.
- F. The A/E reserves the right to invoice the Contractor for time spent for multiple reviews of submittals that are the result of incomplete, inaccurate, or noncompliant submittals being rejected.

1.6 COORDINATION DRAWINGS

- A. The contract drawings show the design intent diagrammatically. They do not show the exact utility routing nor every elbow, offset, etc. Contractor shall coordinate and submit scope of work layout with all overhead utility trades in exposed visible to view ceiling areas for architect's review and approval and make adjustments to their systems to avoid conflict with the structure and other disciplines. These adjustments shall be made by the construction team prior to the start of construction during their coordination process.

SECTION 22 05 00
PLUMBING GENERAL REQUIREMENTS

- B. Prior to installation, the construction team (including all contractors and subcontractors) shall coordinate proposed utility routing, equipment/device locations, code-required and maintenance clearances, etc. amongst each other to ensure no two objects occupy the same space. Such coordination shall be submitted to the A/E and Owner's Representative in the form of an electronic 3D model or 2D floor plans. The Contractor shall notate any conflicts. The A/E will comment on identified conflicts but will not perform coordination for the construction team.
- C. Coordination drawings shall include everything required for a complete installation including, but not limited to, structure, walls, ceilings, equipment, utilities (routing and elevations), components, access panels, hangers, supports, and clearances.
- D. 3D models shall be viewable without the need to purchase specialty software other than the Autodesk AEC Collection.
- E. 2D floor plans shall be submitted in PDF form. Floor plans shall be of a scale that clearly depicts the installation. Plans that are too congested or unclear will not be accepted. Submit each trade on their own floor plan and all trades overlaid onto one combined floor plan. Each trade's work shall have a distinct color to assist in legibility of combined floor plan.
- F. Astral Engineers will provide Revit or AutoCAD electronic files of design models upon request. Such models may be used by contractors as a starting point but must be updated by the construction team during their coordination process. The Contractor shall complete and return waiver (waiver to be provided by Astral Engineers) prior to release of requested documents.
- G. Layout shall be coordinated such that the need for additional access panels is avoided, when possible. Additional access panels beyond those shown in the contract documents must be approved by the A/E. If additional access panels are approved by the A/E, they shall be provided at no additional cost.

1.7 MATERIAL SUBSTITUTION

- A. The Contractor may submit a request for a material substitution for any item made by a manufacturer not listed as an approved manufacturer in the applicable specification. The request shall include enough information for the A/E to determine if the substituted item is of equal or better performance and quality than that listed in the contract documents.
- B. Material substitution requests shall be submitted no later than the last day for pre-bid RFIs.
- C. If a material substitution request is not submitted on time, the Contractor may include the substitution as a voluntary substitution on the bid form. Such substitutions will not be considered in determining the low bidder.
- D. The Contractor that submitted the material substitution is responsible for any additional costs incurred by other Contractors as a result of the alternate product.

1.8 VALUE ENGINEERING

- A. If material or design changes are proposed during construction in an effort to save costs and the Owner agrees to the changes, the Contractor shall pay the design team on a time and material basis to address engineering modifications required.

1.9 WARRANTY

- A. Provide a minimum of one-year parts and labor warranty for all fixtures, equipment, components, materials, and workmanship. Longer warranties may be required for certain systems as noted in other specification sections.
- B. The warranty period shall start on the date of final acceptance by the Owner. If a newly installed system or piece of equipment is needed to operate the building during construction, the Contractor may agree to a warranty period start date with the Owner that begins prior to the final acceptance of the overall project. The Contractor shall obtain such an agreement in writing from the Owner's Representative.
- C. The Contractor shall adjust the systems at seasonal changes, as needed, during the one-year warranty period to prove satisfactory operation during all seasons.

1.10 CHANGE ORDERS

- A. Submit a detailed material and labor takeoff for each change order. Identify cost additions and credits based on revised scope. Material costs and required labor hours shall closely align with reputable cost estimating publications. Change orders lacking sufficient breakdown of costs and supporting documentation will be rejected.
- B. Do not proceed with change order work until authorized.

PART 2 - PRODUCTS

2.1 NOT APPLICABLE

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor is solely responsible for jobsite safety.
- B. Work shall be completed by individuals qualified and competent in that specific task.
- C. Work that will produce excessive noise shall be completed during unoccupied hours. Coordinate schedule of noisy operations with the Owner's Representative.
- D. Install equipment, devices, and components with sufficient clearance to easily maintain parts. Review the final location of equipment with the Owner's Representative prior to setting equipment.
- E. Provide factory or field-supplied guard to protect personnel from coming into contact with rotating equipment components.
- F. Provide temporary power as needed to support construction activities. Remove temporary power when no longer needed.
- G. Provide temporary heaters as needed to prevent construction site from freezing temperatures and potential damage to temperature-sensitive equipment, components, utilities, etc. Remove temporary heaters when no longer needed.
- H. Thoroughly clean entire project site prior to final turnover to the Owner.

3.2 PRODUCT HANDLING AND STORAGE

- A. The Contractor shall review the required path of travel to navigate equipment, devices, materials, etc. to and from the project area prior to submitting a bid. Overcoming any obstacles shall be accounted for in the bid.
- B. Carefully transport and store equipment, devices, materials, etc. to prevent damage. The Contractor shall replace damaged items at no additional cost.
- C. Paint equipment and devices that are scratched prior to Owner's acceptance. Paint type and color shall match original.

3.3 EXCAVATION AND BACKFILL

- A. The Contractor shall visit the site and confirm existing surface types prior to submitting a bid.
- B. The Contractor shall verify all underground utility locations with the local utility locator prior to starting any excavation.
- C. Do not damage structure, equipment, or utilities when performing excavation. Be careful to not undermine the foundation.
- D. When trenches are made below existing concrete the Contractor shall provide neat saw cuts with clean edges. Remove portions of demolished concrete from the site.
- E. Provide, operate, and remove dewatering pumps and piping, as needed, to keep water out of trenches. Protect excavation against frost, as needed.
- F. Dispose of excess excavated soil. Restore surfaces to their original condition.
- G. Backfill trenches as soon after inspection as practicable.
 - 1. Backfill material below pipe/conduit and up to 6" above pipe/conduit shall be imported sand consisting of natural or manufactured granular material. Material shall be free of deleterious amounts of organic material, mica, loam, and clay, and shall have a sand equivalent (SE) of 30 or greater with the following gradation: 100% shall pass through a 3/8" sieve, 95% shall pass through a No. 4 sieve, 30% shall pass through a No. 30 sieve, and 5% shall pass through a No. 200 sieve.
 - 2. Backfill material 6" above pipe/conduit and higher shall be sand, CA6, or clean earth. Material shall be free of stones 4" and larger, cinder fill, frozen earth, construction debris, or other material that will damage the pipe/conduit.
 - 3. Pipe/conduit shall be placed on a 6" bedding layer followed by additional layers not to exceed 6" high per layer. All layers shall be compacted to 95% of the maximum density. Moisture content of backfill shall not exceed +2% of the optimum moisture content. Precaution shall be taken to ensure compactness of backfill around piping without damage to such piping/conduit.
 - 4. Provide 6" of topsoil where disturbed areas are to be seeded or sodded.

3.4 OCCUPIED BUILDING UNDER CONSTRUCTION IAQ

- A. Coordinate IAQ plan with Owner's Representative throughout construction.
- B. The Contractor shall take steps necessary, including those in SMACNA IAQ Guidelines for Occupied Buildings Under Construction, to minimize construction dust/contaminants in order to limit the impact to the air quality of the adjacent occupied areas.
- C. Construction activities that produce excessive dust shall be completed during unoccupied hours.
- D. The construction site entrance shall not go through the existing building, if possible.
- E. Adhesives and sealants shall be tested and compliant with applicable low emitting materials limits.

3.5 A/E JOBSITE OBSERVATIONS

- A. The Contractor shall provide one full week notice to the A/E prior to making utility installation inaccessible to allow for visual observation of installed work by A/E. Such actions include backfilling over underground utilities or closing walls or ceilings containing utilities.
- B. By notifying the A/E that the underground, above ceiling, or in wall work is ready for observation, the Contractor is certifying that such work is complete and does not require additional work. This includes, but is not limited to, hangers, supports, insulation, identification, and sealed penetrations. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.
- C. IMPORTANT: Astral Engineers must observe the installation of their portion of the design. If observation of such installation is prevented due to the work being covered by backfill, walls, ceilings, etc. prior to observation by Astral Engineers, the Contractor will be required to expose the work so it can be adequately observed.
- D. By notifying the A/E that the construction is complete and ready for the final jobsite observation, the Contractor is certifying that such work is complete and does not require additional work. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.
- E. Astral Engineers will issue a jobsite observation report after each site visit noting any installation deficiencies, if any. The Contractor shall fix all deficiencies to the satisfaction of the A/E. Provide photographic and/or video evidence of corrected deficiencies signed off if requested by the A/E. The construction schedule shall account for these site visits and required corrections. Schedule extensions will not be allowed to accommodate A/E jobsite observations.

3.6 SYSTEM STARTUP AND TURNOVER

- A. The Contractor shall perform complete system startup, calibration, testing, adjusting, and balancing. Refer to manufacturer startup procedures.

- B. All operating conditions, control sequences, interlocks, and alarms shall be tested during the startup process.
- C. Contractor shall provide verbal and written training for the Owner's representatives regarding the complete maintenance and operation requirements for all systems. Manufacturer personnel shall provide such instruction for major equipment and systems.

3.7 PROJECT CLOSEOUT

- A. Operation and Maintenance Manuals:
 - 1. Email a bookmarked electronic copy of the O&M manuals in PDF format to the A/E. All text shall be searchable.
 - 2. Provide the Owner a copy of the O&M manuals on disc or flash drive. Disc or flash drive shall be labeled with project name and "O&M Manual".
 - 3. Content Requirements:
 - a. Provide title page with the project name, Architect, Engineers, Contractors, and major equipment suppliers. Include a point of contact for each entity with telephone numbers and email addresses.
 - b. Provide table of contents with hyperlinks to content within document.
 - c. Provide parts lists, wiring diagrams, control diagrams, operating procedures, and maintenance schedule and procedures for all systems.
 - d. Provide all approved submittals, testing reports, equipment startup reports, factory inspection reports, and warranties.
 - e. Group submittals and other supplemental information with the associated O&M manual to maintain a neat and organized document.
- B. Record Documents:
 - 1. The Contractor shall clearly markup drawings to indicate equipment, device, component, and/or utility actual installed location and size. Provide such marked up as-built drawings to A/E at the completion of construction.
 - 2. The Contractor shall clearly markup specifications to indicate any changes to contract specifications based on actual installed conditions. Provide such marked up specifications to A/E at the completion of construction.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 23 05 00 – MECHANICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. General requirements applicable to all Division 23 Sections.

1.2 DEFINITIONS

- A. A/E: Project Architect and/or Engineer.
- B. Furnish: To purchase/supply.
- C. Install: To place in position and connect complete ready for use.
- D. Provide: To furnish and install.

1.3 GENERAL

- A. The contract drawings are a diagrammatic representation of the design intent. They do not show every component required for a complete and operational system. The Contractor shall install complete and operational systems based on the design intent.
- B. The installation shall comply with the contract documents, applicable codes, manufacturer's installation recommendations, published Owner standards, utility company requirements, and requirements of the AHJ.
 - 1. Notify the A/E in writing of any discrepancies in the contract documents and any of the authorities listed above prior to submitting a bid.
 - 2. If there is a discrepancy between manufacturer's installation recommendations and the contract documents, the manufacturer's recommendations shall take precedence.
 - 3. If there are conflicting requirements in the contract documents, the more restrictive requirement shall govern.
- C. Contractor shall apply, procure, and pay for required permits, licenses, inspections, and any other fees.

1.4 EXAMINATION OF CONTRACT DOCUMENTS

- A. The drawings show the design intent diagrammatically. They do not show the exact routing nor every elbow, offset, etc. Do not scale the drawings. The Contractor shall determine the exact installed locations and routing to achieve the design intent. The cost of reasonable adjustments to locations and routing shall be included in the bid. The Contractor shall visit the project site prior to submitting a bid to confirm existing conditions and new work plan of action.
- B. Where discrepancies in quantities or sizes exist in the contract documents the greater number shall govern.
- C. Verify all dimensions at the jobsite prior to ordering any materials.

1.5 SUBMITTALS

- A. Submittals shall be required if requested in applicable specification section or drawings. Submittals will not be reviewed by engineer for specific products if they are not requested in the contract documents.
- B. Contractor shall provide separate submittal packages for each specification section. Submittals including multiple specification sections are not acceptable. All items within an individual specification section shall be provided within a single submittal. Providing multiple submittals for a single specification section is not acceptable unless the project has multiple phases.
- C. Submittals shall be in PDF format. File name shall include the specification number and description of the submitted item.
- D. Content Requirements:
 - 1. Each submittal shall include a cover sheet containing date, project name and number, contractor's name and address, specification number, items submitted, deviations from contract documents, and a blank space for review stamps.
 - 2. Submitted items that have a scheduled equipment tag number on the contract documents shall bear such tag number in the submittal to clearly identify submitted item.
 - 3. Selected options such as model, material, finish, etc. shall be clearly identified.
 - 4. Contractor shall provide review stamp on each submittal, including name of reviewer and date, indicating the content in the submittal has been thoroughly reviewed for completeness and accuracy prior to submitting.
 - 5. Clearly identify deviations, if any, from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.
- E. Submittals shall be approved by the A/E prior to ordering items. Approval of submittals does not relieve the contractor's obligation to comply with the contract documents.
- F. The A/E reserves the right to invoice the Contractor for time spent for multiple reviews of submittals that are the result of incomplete, inaccurate, or noncompliant submittals being rejected.

1.6 COORDINATION DRAWINGS

- A. The contract drawings show the design intent diagrammatically. They do not show the exact utility routing nor every elbow, offset, etc. Contractor shall coordinate and submit scope of work layout with all overhead utility trades in exposed visible to view ceiling areas for architects review and approval and make adjustments to their systems to avoid conflict with the structure and other disciplines. These adjustments shall be made by the construction team prior to the start of construction during their coordination process.
- B. Prior to installation, the construction team (including all contractors and subcontractors) shall coordinate proposed utility routing, equipment/device locations, code-required and

maintenance clearances, etc. amongst each other to ensure no two objects occupy the same space. Such coordination shall be submitted to the A/E and Owner's Representative in the form of an electronic 3D model or 2D floor plans. The Contractor shall notate any conflicts. The A/E will comment on identified conflicts but will not perform coordination for the construction team.

- C. Coordination drawings shall include everything required for a complete installation including, but not limited to, structure, walls, ceilings, equipment, utilities (routing and elevations), components, access panels, hangers, supports, and clearances.
- D. 3D models shall be viewable without the need to purchase specialty software other than the Autodesk AEC Collection.
- E. 2D floor plans shall be submitted in PDF form. Floor plans shall be of a scale that clearly depicts the installation. Plans that are too congested or unclear will not be accepted. Submit each trade on their own floor plan and all trades overlaid onto one combined floor plan. Each trade's work shall have a distinct color to assist in legibility of combined floor plan.
- F. Astral Engineers will provide Revit or AutoCAD electronic files of design models upon request. Such models may be used by contractors as a starting point but must be updated by the construction team during their coordination process. The Contractor shall complete and return waiver (waiver to be provided by Astral Engineers) prior to release of requested documents.
- G. Layout shall be coordinated such that the need for additional access panels is avoided, when possible. Additional access panels beyond those shown in the contract documents must be approved by the A/E. If additional access panels are approved by the A/E, they shall be provided at no additional cost.

1.7 MATERIAL SUBSTITUTION

- A. The Contractor may submit a request for a material substitution for any item made by a manufacturer not listed as an approved manufacturer in the applicable specification. The request shall include enough information for the A/E to determine if the substituted item is of equal or better performance and quality than that listed in the contract documents.
- B. Material substitution requests shall be submitted no later than the last day for pre-bid RFIs.
- C. If a material substitution request is not submitted on time, the Contractor may include the substitution as a voluntary substitution on the bid form. Such substitutions will not be considered in determining the low bidder.
- D. The Contractor that submitted the material substitution is responsible for any additional costs incurred by other Contractors as a result of the alternate product.

1.8 VALUE ENGINEERING

- A. If material or design changes are proposed during construction in an effort to save costs and the Owner agrees to the changes, the Contractor shall pay the design team on a time and material basis to address engineering modifications required.

1.9 WARRANTY

- A. Provide a minimum of one-year parts and labor warranty for all fixtures, equipment, components, materials, and workmanship. Longer warranties may be required for certain systems as noted in other specification sections.
- B. The warranty period shall start on the date of final acceptance by the Owner. If a newly installed system or piece of equipment is needed to operate the building during construction, the Contractor may agree to a warranty period start date with the Owner that begins prior to the final acceptance of the overall project. The Contractor shall obtain such an agreement in writing from the Owner's Representative.
- C. The Contractor shall adjust the systems at seasonal changes, as needed, during the one-year warranty period to prove satisfactory operation during all seasons.

1.10 CHANGE ORDERS

- A. Submit a detailed material and labor takeoff for each change order. Identify cost additions and credits based on revised scope. Material costs and required labor hours shall closely align with reputable cost estimating publications. Change orders lacking sufficient breakdown of costs and supporting documentation will be rejected.
- B. Do not proceed with change order work until authorized.

PART 2 - PRODUCTS

2.1 NOT APPLICABLE

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor is solely responsible for jobsite safety.
- B. Work shall be completed by individuals qualified and competent in that specific task.
- C. Work that will produce excessive noise shall be completed during unoccupied hours. Coordinate schedule of noisy operations with the Owner's Representative.
- D. Install equipment, devices, and components with sufficient clearance to easily maintain parts. Review the final location of equipment with the Owner's Representative prior to setting equipment.
- E. Provide factory or field-supplied guard to protect personnel from coming into contact with rotating equipment components.
- F. Provide temporary power as needed to support construction activities. Remove temporary power when no longer needed.
- G. Thoroughly clean entire project site prior to final turnover to the Owner.

3.2 PRODUCT HANDLING AND STORAGE

- A. The Contractor shall review the required path of travel to navigate equipment, devices, materials, etc. to and from the project area prior to submitting a bid. Overcoming any obstacles shall be accounted for in the bid.
- B. Carefully transport and store equipment, devices, materials, etc. to prevent damage. The Contractor shall replace damaged items at no additional cost.
- C. Paint equipment and devices that are scratched prior to Owner's acceptance. Paint type and color shall match original.

3.3 OCCUPIED BUILDING UNDER CONSTRUCTION IAQ

- A. Coordinate IAQ plan with Owner's Representative throughout construction.
- B. The Contractor shall take steps necessary, including those in SMACNA IAQ Guidelines for Occupied Buildings Under Construction, to minimize construction dust/contaminants in order to limit the impact to the air quality of the adjacent occupied areas.
- C. Construction activities that produce excessive dust shall be completed during unoccupied hours.
- D. The construction site entrance shall not go through the existing building, if possible.
- E. Adhesives and sealants shall be tested and compliant with applicable low emitting materials limits.

3.4 A/E JOBSITE OBSERVATIONS

- A. The Contractor shall provide one full week notice to the A/E prior to making utility installation inaccessible to allow for visual observation of installed work by A/E. Such actions include backfilling over underground utilities or closing walls or ceilings containing utilities.
- B. By notifying the A/E that the underground, above ceiling, or in wall work is ready for observation, the Contractor is certifying that such work is complete and does not require additional work. This includes, but is not limited to, hangers, supports, insulation, identification, and sealed penetrations. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.
- C. IMPORTANT: Astral Engineers must observe the installation of their portion of the design. If observation of such installation is prevented due to the work being covered by backfill, walls, ceilings, etc. prior to observation by Astral Engineers, the Contractor will be required to expose the work so it can be adequately observed.
- D. By notifying the A/E that the construction is complete and ready for the final jobsite observation, the Contractor is certifying that such work is complete and does not require additional work. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.

- E. Astral Engineers will issue a jobsite observation report after each site visit noting any installation deficiencies, if any. The Contractor shall fix all deficiencies to the satisfaction of the A/E. Provide photographic and/or video evidence of corrected deficiencies signed off if requested by the A/E. The construction schedule shall account for these site visits and required corrections. Schedule extensions will not be allowed to accommodate A/E jobsite observations.

3.5 SYSTEM STARTUP AND TURNOVER

- A. The Contractor shall perform complete system startup, calibration, testing, adjusting, and balancing. See manufacturer startup procedures.
- B. All operating conditions, control sequences, interlocks, and alarms shall be tested during the startup process.
- C. Contractor shall provide verbal and written training for the Owner's representatives regarding the complete maintenance and operation requirements for all systems. Manufacturer personnel shall provide such instruction for major equipment and systems.

3.6 PROJECT CLOSEOUT

- A. Operation and Maintenance Manuals:
 - 1. Email a bookmarked electronic copy of the O&M manuals in PDF format to the A/E. All text shall be searchable.
 - 2. Provide the Owner a copy of the O&M manuals on disc or flash drive. Disc or flash drive shall be labeled with project name and "O&M Manual".
 - 3. Content Requirements:
 - a. Provide title page with the project name, Architect, Engineers, Contractors, and major equipment suppliers. Include a point of contact for each entity with telephone numbers and email addresses.
 - b. Provide table of contents with hyperlinks to content within document.
 - c. Provide parts lists, wiring diagrams, control diagrams, operating procedures, and maintenance schedule and procedures for all systems.
 - d. Provide all approved submittals, testing reports, equipment startup reports, factory inspection reports, and warranties.
 - e. Group submittals and other supplemental information with the associated O&M manual to maintain a neat and organized document.
- B. Record Documents:
 - 1. The Contractor shall clearly markup drawings to indicate equipment, device, component, and/or utility actual installed location and size. Provide such marked up as-built drawings to A/E at the completion of construction.
 - 2. The Contractor shall clearly markup specifications to indicate any changes to contract specifications based on actual installed conditions. Provide such marked up specifications to A/E at the completion of construction.

END OF SECTION

SECTION 26 05 00 - ELECTRICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General requirements applicable to all Division 26 Sections.

1.2 DEFINITIONS

- A. A/E: Project Architect and/or Engineer.
- B. Furnish: To purchase/supply.
- C. Install: To place in position and connect complete ready for use.
- D. Provide: To furnish and install.

1.3 GENERAL

- A. The contract drawings are a diagrammatic representation of the design intent. They do not show every component required for a complete and operational system. The Contractor shall install complete and operational systems based on the design intent.
- B. The installation shall comply with the contract documents, applicable codes, manufacturer's installation recommendations, published Owner standards, utility company requirements, and requirements of the AHJ.
 - 1. Notify the A/E in writing of any discrepancies in the contract documents and any of the authorities listed above prior to submitting a bid.
 - 2. If there is a discrepancy between manufacturer's installation recommendations and the contract documents, the manufacturer's recommendations shall take precedence.
 - 3. If there are conflicting requirements in the contract documents, the more restrictive requirement shall govern.
- C. Contractor shall apply, procure, and pay for required permits, licenses, inspections, utility service connections (including meters), and any other fees.

1.4 EXAMINATION OF CONTRACT DOCUMENTS

- A. The drawings show the design intent diagrammatically. They do not show the exact routing nor every elbow, offset, etc. Do not scale the drawings. The Contractor shall determine the exact installed locations and routing to achieve the design intent. The cost of reasonable adjustments to locations and routing shall be included in the bid. The Contractor shall visit the project site prior to submitting a bid to confirm existing conditions and new work plan of action.
- B. Where discrepancies in quantities or sizes exist in the contract documents the greater number shall govern.
- C. Verify all dimensions at the jobsite prior to ordering any materials.

1.5 SUBMITTALS

- A. Submittals shall be required if requested in applicable specification section or drawings. Submittals will not be reviewed by engineer for specific products if they are not requested in the contract documents.
- B. Contractor shall provide separate submittal packages for each specification section. Submittals including multiple specification sections are not acceptable. All items within an individual specification section shall be provided within a single submittal. Providing multiple submittals for a single specification section is not acceptable unless the project has multiple phases.
- C. Submittals shall be in PDF format. File name shall include the specification number and description of the submitted item.
- D. Content Requirements:
 - 1. Each submittal shall include a cover sheet containing date, project name and number, contractor's name and address, specification number, items submitted, deviations from contract documents, and a blank space for review stamps.
 - 2. Submitted items that have a scheduled equipment tag number on the contract documents shall bear such tag number in the submittal to clearly identify submitted item.
 - 3. Selected options such as model, material, finish, etc. shall be clearly identified.
 - 4. Contractor shall provide review stamp on each submittal, including name of reviewer and date, indicating the content in the submittal has been thoroughly reviewed for completeness and accuracy prior to submitting.
 - 5. Clearly identify deviations, if any, from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.
- E. Submittals shall be approved by the A/E prior to ordering items. Approval of submittals does not relieve the contractor's obligation to comply with the contract documents.
- F. The A/E reserves the right to invoice the Contractor for time spent for multiple reviews of submittals that are the result of incomplete, inaccurate, or noncompliant submittals being rejected.

1.6 COORDINATION DRAWINGS

- A. The contract drawings show the design intent diagrammatically. They do not show the exact utility routing nor every elbow, offset, etc. Where required the Contractor shall make adjustments to their systems to avoid conflict with the structure and other disciplines. These adjustments shall be made by the construction team prior to the start of construction during their coordination process.
- B. Prior to installation, the construction team (including all contractors and subcontractors) shall coordinate proposed utility routing, equipment/device locations, code-required and maintenance clearances, etc. amongst each other to ensure no two objects occupy the same space. Such coordination shall be submitted to the A/E and Owner's Representative in the form of an electronic 3D model or 2D floor plans. The Contractor shall notate any conflicts. The A/E will comment on identified conflicts but will not perform coordination for the construction team.

SECTION 26 05 00
ELECTRICAL GENERAL REQUIREMENTS

- C. Coordination drawings shall include everything required for a complete installation including, but not limited to, structure, walls, ceilings, equipment, utilities (routing and elevations), components, access panels, hangers, supports, and clearances.
- D. 3D models shall be viewable without the need to purchase specialty software other than the Autodesk AEC Collection.
- E. 2D floor plans shall be submitted in PDF form. Floor plans shall be of a scale that clearly depicts the installation. Plans that are too congested or unclear will not be accepted. Submit each trade on their own floor plan and all trades overlaid onto one combined floor plan. Each trade's work shall have a distinct color to assist in legibility of combined floor plan.
- F. Astral Engineers will provide Revit or AutoCAD electronic files of design models upon request. Such models may be used by contractors as a starting point but must be updated by the construction team during their coordination process. The Contractor shall complete and return waiver (waiver to be provided by Astral Engineers) prior to release of requested documents.
- G. Layout shall be coordinated such that the need for additional access panels is avoided, when possible. Additional access panels beyond those shown in the contract documents must be approved by the A/E. If additional access panels are approved by the A/E, they shall be provided at no additional cost.
- H. Contractor shall coordinate and submit scope of work layout with all overhead utility trades in exposed visible to view ceiling areas for architects review and approval.

1.7 MATERIAL SUBSTITUTION

- A. The Contractor may submit a request for a material substitution for any item made by a manufacturer not listed as an approved manufacturer in the applicable specification. The request shall include enough information for the A/E to determine if the substituted item is of equal or better performance and quality than that listed in the contract documents.
- B. Material substitution requests shall be submitted no later than the last day for pre-bid RFIs.
- C. If a material substitution request is not submitted on time, the Contractor may include the substitution as a voluntary substitution on the bid form. Such substitutions will not be considered in determining the low bidder.
- D. The Contractor that submitted the material substitution is responsible for any additional costs incurred by other Contractors as a result of the alternate product.

1.8 VALUE ENGINEERING

- A. If material or design changes are proposed during construction in an effort to save costs and the Owner agrees to the changes, the Contractor shall pay the design team on a time and material basis to address engineering modifications required.

1.9 WARRANTY

- A. Provide a minimum of one-year parts and labor warranty for all fixtures, equipment, components, materials, and workmanship. Longer warranties may be required for certain systems as noted in other specification sections.

- B. The warranty period shall start on the date of final acceptance by the Owner. If a newly installed system or piece of equipment is needed to operate the building during construction, the Contractor may agree to a warranty period start date with the Owner that begins prior to the final acceptance of the overall project. The Contractor shall obtain such an agreement in writing from the Owner's Representative.
- C. The Contractor shall adjust the systems at seasonal changes, as needed, during the one-year warranty period to prove satisfactory operation during all seasons.

1.10 CHANGE ORDERS

- A. Submit a detailed material and labor takeoff for each change order. Identify cost additions and credits based on revised scope. Material costs and required labor hours shall closely align with reputable cost estimating publications. Change orders lacking sufficient breakdown of costs and supporting documentation will be rejected.
- B. Do not proceed with change order work until authorized.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

- A. The Contractor is solely responsible for jobsite safety.
- B. Work shall be completed by individuals qualified and competent in that specific task.
- C. Work that will produce excessive noise shall be completed during unoccupied hours. Coordinate schedule of noisy operations with the Owner's Representative.
- D. Install equipment, devices, and components with sufficient clearance to easily maintain parts. Review the final location of equipment with the Owner's Representative prior to setting equipment.
- E. Provide factory or field-supplied guard to protect personnel from coming into contact with rotating equipment components.
- F. Provide temporary power as needed to support construction activities. Remove temporary power when no longer needed.
- G. Provide temporary heaters as needed to prevent construction site from freezing temperatures and potential damage to temperature-sensitive equipment, components, utilities, etc. Remove temporary heaters when no longer needed.
- H. Thoroughly clean entire project site prior to final turnover to the Owner.

3.2 PRODUCT HANDLING AND STORAGE

- A. The Contractor shall review the required path of travel to navigate equipment, devices, materials, etc. to and from the project area prior to submitting a bid. Overcoming any obstacles shall be accounted for in the bid.

- B. Carefully transport and store equipment, devices, materials, etc. to prevent damage. The Contractor shall replace damaged items at no additional cost.
- C. Paint equipment and devices that are scratched prior to Owner's acceptance. Paint type and color shall match original.

3.3 A/E JOBSITE OBSERVATIONS

- A. The Contractor shall provide one full week notice to the A/E prior to making utility installation inaccessible to allow for visual observation of installed work by A/E. Such actions include backfilling over underground utilities or closing walls or ceilings containing utilities.
- B. By notifying the A/E that the underground, above ceiling, or in wall work is ready for observation, the Contractor is certifying that such work is complete and does not require additional work. This includes, but is not limited to, hangers, supports, insulation, identification, and sealed penetrations. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.
- C. IMPORTANT: Astral Engineers must observe the installation of their portion of the design. If observation of such installation is prevented due to the work being covered by backfill, walls, ceilings, etc. prior to observation by Astral Engineers, the Contractor will be required to expose the work so it can be adequately observed.
- D. By notifying the A/E that the construction is complete and ready for the final jobsite observation, the Contractor is certifying that such work is complete and does not require additional work. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.
- E. Astral Engineers will issue a jobsite observation report after each site visit noting any installation deficiencies, if any. The Contractor shall fix all deficiencies to the satisfaction of the A/E. Provide photographic and/or video evidence of corrected deficiencies signed off if requested by the A/E. The construction schedule shall account for these site visits and required corrections. Schedule extensions will not be allowed to accommodate A/E jobsite observations.

3.4 SYSTEM STARTUP AND TURNOVER

- A. The Contractor shall perform complete system startup, calibration, and testing. See manufacturer startup procedures.
- B. All operating conditions, control sequences, interlocks, and alarms shall be tested during the startup process.
- C. Contractor shall provide verbal and written training for the Owner's representatives regarding the complete maintenance and operation requirements for all systems. Manufacturer personnel shall provide such instruction for major equipment and systems.

3.5 PROJECT CLOSEOUT

- A. Operation and Maintenance Manuals:
 - 1. Email a bookmarked electronic copy of the O&M manuals in PDF format to the A/E. All text shall be searchable.

SECTION 26 05 00
ELECTRICAL GENERAL REQUIREMENTS

2. Provide the Owner a copy of the O&M manuals on disc or flash drive. Disc or flash drive shall be labeled with project name and "O&M Manual".
3. Content Requirements:
 - a. Provide title page with the project name, Architect, Engineers, Contractors, and major equipment suppliers. Include a point of contact for each entity with telephone numbers and email addresses.
 - b. Provide table of contents with hyperlinks to content within document.
 - c. Provide parts lists, wiring diagrams, control diagrams, operating procedures, and maintenance schedule and procedures for all systems.
 - d. Provide all approved submittals, testing reports, equipment startup reports, factory inspection reports, and warranties.
 - e. Group submittals and other supplemental information with the associated O&M manual to maintain a neat and organized document.
- B. Record Documents:
 1. The Contractor shall clearly markup drawings to indicate equipment, device, component, and/or utility actual installed location and size. Provide such marked up as-built drawings to A/E at the completion of construction.
 2. The Contractor shall clearly markup specifications to indicate any changes to contract specifications based on actual installed conditions. Provide such marked up specifications to A/E at the completion of construction.

END OF SECTION

SECTION 26 05 05 - ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Selective demolition.
- B. Patching.

1.2 QUALITY ASSURANCE

- A. Demolition firm shall be a company specializing in the type of work required with a minimum of five years of documented experience.

PART 2 - PRODUCTS

2.1 NOT APPLICABLE

PART 3 - EXECUTION

3.1 GENERAL

- A. The drawings are diagrammatic and do not show every conduit, fitting, wire, accessory, etc. required to be removed. The Contractor shall visit the site prior to bid submission to verify all field conditions.
- B. Comply with other requirements specified in Divisions 01 and 02.
- C. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Comply with applicable requirements of NFPA 241.
 - 2. Use of explosives is not permitted.
 - 3. Provide, erect, and maintain temporary barriers and security devices.
 - 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 a 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.
- D. Do not begin removal until built elements to be salvaged or relocated have been removed, vegetation to be relocated has been removed, measures have been taken to protect

existing conditions to remain, and the Contractor has received notification to proceed from the Owner.

- E. 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.
- F. 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.
- G. Install temporary filters over outside air intakes within 100' of the construction area. If construction activities result in debris affecting existing to remain systems, the Contractor shall completely clean such systems.
- H. If hazardous materials are discovered during removal operations, stop work and notify A/E and Owner's Representative. Hazardous materials include regulated asbestos containing materials, lead, polychlorinated biphenyls, and mercury.
- I. Removal of hazardous materials shall comply with 29 CFR 1926 and state and local regulations.
- J. Perform demolition in a manner that maximizes salvage and recycling of materials.
 - 1. Dismantle existing construction and separate materials.
 - 2. Set aside reusable, recyclable, and salvageable materials. Store and deliver to collection point or point of reuse.

3.2 EXISTING UTILITIES

- A. Coordinate work with utility companies. Notify applicable utility companies before starting work and comply with their requirements.
- B. Protect existing utilities to prevent damage.
- C. Do not disrupt public utilities without permission from the AHJ.
- D. Do not close, shut off, or disrupt existing systems that are in use without at least two weeks prior written notification to the Owner's Representative.
- E. Remove conduit, wire, meters, equipment, hangers, supports, and foundations of disconnected and abandoned utilities.
- F. Patch holes resulting from the removal of existing utilities to match existing construction. Provide firestopping as required in fire-rated walls.

3.3 SELECTIVE DEMOLITION

- A. Drawings showing existing construction and utilities are based on nondestructive field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.

2. Report discrepancies to A/E 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. Separate areas in which demolition is being conducted from other areas that are still occupied. Provide, erect, and maintain temporary dustproof, sound retardant partitions separating the construction area and adjacent occupied spaces.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications. Take care to prevent water and humidity damage.
- D. Remove existing systems and equipment as indicated and as required to accomplish new work.
1. Existing systems that serve areas outside of the construction area shall remain active. Maintain access to equipment and operational components. Where existing systems must be shut off to allow for new connections, provide at least two weeks prior written notification to the Owner's Representative.
 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 3. Verify that abandoned services serve only abandoned facilities before removal.
 4. Remove abandoned equipment, conduits, wires, controls, and associated hangers, supports, accessories, etc. including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- E. Protect existing work to remain.
1. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 2. Repair adjacent construction and finishes damaged during removal work.
 3. Patch as specified for patching new work.

3.4 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove all materials not to be reused from site.
- 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

SECTION 26 05 33.13 – CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Flexible metal conduit (FMC).
- B. Liquidtight flexible metal conduit (LFMC).
- C. Electrical metallic tubing (EMT).
- D. Accessories.

1.2 SUBMITTALS

- A. See Section 26 05 00 – Electrical General Requirements for submittal procedures.
- B. Provide manufacturer's standard catalog pages and data sheets for conduits, including detailed information on materials, construction, ratings, listings, and available sizes, and configurations.
- C. Expand to include coordinated routing in exposed ceiling areas and Provide actual routing for conduits installed underground, conduits embedded within concrete slabs, and conduits 2" trade size and larger.

D. Contractor shall coordinate and submit scope of work layout with all overhead utility trades in exposed visible view ceiling areas for architects review and approval.

- E. Manufacturer's installation instructions shall indicate any special procedures.

1.3 QUALITY ASSURANCE

- A. Install conduits in accordance with NFPA 70.
- B. Conduits shall comply with UL 514B.
- C. Manufacturer shall be a company specializing in manufacturing the type of products specified in this section with a minimum of five years of documented experience.
- D. Installer shall be a company specializing in performing the work of this section with a minimum of five years of documented experience.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Allied Tube & Conduit
- B. Nucor Tubular Products
- C. Western Tube
- D. Bridgeport Fittings
- E. Thomas & Betts

- F. Champion Fiberglass

2.2 CONDUIT GENERAL APPLICATIONS

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
- C. Concealed within hollow stud walls shall be galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- D. Concealed above accessible ceilings shall be galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- E. Exposed, interior, not subject to physical damage shall be galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- F. Exposed, interior, subject to physical damage shall be galvanized steel rigid metal conduit.
- G. Connections to luminaires above accessible ceilings shall be flexible metal conduit.
 - 1. Maximum Length shall be 6'.
- H. Connections to vibrating equipment:
 - 1. Dry locations shall use flexible metal conduit.
 - 2. Damp, wet, or corrosive locations shall be liquid tight flexible metal conduit.
 - 3. Maximum length shall be 6' unless otherwise indicated.

2.3 CONDUIT GENERAL REQUIREMENTS

- A. Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.
- B. Fittings for grounding and bonding shall Also comply with Section 26 0526.
- C. Minimum conduit size, unless otherwise indicated:
 - 1. Branch circuits shall be 3/4" minimum trade size.
 - 2. Branch circuit homeruns shall be 3/4" minimum trade size.
 - 3. Control circuits shall be 1/2" minimum trade size.
 - 4. Flexible connections to luminaires shall be 3/8" minimum trade size.
- D. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.4 FLEXIBLE METAL CONDUIT (FMC)

- A. NFPA 70, type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.
- B. Fittings shall comply with NEMA FB 1 and be listed and labeled as complying with UL 514B. Material shall be steel or malleable iron.

2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. NFPA 70, type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.
- B. Fittings shall comply with NEMA FB 1 and be listed and labeled as complying with UL 514B. Material shall be steel or malleable iron. Do not use die cast zinc fittings.

2.6 ELECTRICAL METALLIC TUBING (EMT)

- A. NFPA 70, type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
- B. Fittings:
 - 1. Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 - 2. Material shall be steel or malleable iron. Do not use die cast zinc fittings.
 - 3. Connectors and couplings shall be compression (gland) or set-screw type. Do not use indenter type connectors and couplings.
 - 4. Damp or wet locations (where permitted) shall be fittings listed for use in wet locations.
 - 5. Embedded within concrete (where permitted) shall be fittings listed as concrete-tight. Fittings that require taping to be concrete-tight are acceptable.

2.7 ACCESSORIES

- A. Pull strings shall use nylon cord with average breaking strength of not less than 200 pound-force.
- B. Sealing compound for sealing fittings shall be listed for use with the particular fittings to be installed.
- C. Modular seals for conduit penetrations shall be rated for minimum of 40 psi; suitable for the conduits to be installed.
- D. Firestop sleeves shall be listed; provide as required to preserve fire resistance rating of building elements.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with manufacturer's written data.
- B. Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.
- C. Receive, inspect, handle, and store conduit in accordance with manufacturer's instructions. Replace any damaged items.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions and NFPA 70.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Coordinate exact routing with other trades to minimize length of conduit.
- D. Replace materials damaged during installation.
- E. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conduits in NFPA 70.
- F. Conduit Routing:
 - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
 - 2. When conduit destination is indicated without specific routing, determine exact routing required.
 - 3. Conceal all conduits unless specifically indicated to be exposed.
 - 4. Conduits in the following areas may be exposed, unless otherwise indicated on drawings:
 - a. Electrical rooms.
 - b. Mechanical equipment rooms.
 - c. Within joists in areas with no ceiling.
 - 5. Unless otherwise approved, do not route conduits exposed:
 - a. Across floors.
 - b. Across building exterior surfaces.
 - 6. Arrange conduit to maintain adequate headroom, clearances, and access.
 - 7. Arrange conduit to provide no more than the equivalent of four 90° bends between pull points.
 - 8. Arrange conduit to provide no more than 150' between pull points.
 - 9. Route conduits above water and drain piping where possible.
 - 10. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.

11. Maintain minimum clearance of 6" between conduits and piping for other systems.
 12. Maintain minimum clearance of 12" between conduits and hot surfaces. This includes, but is not limited to:
 - a. Heaters.
 - b. Hot water piping.
 - c. Flues.
 13. Group parallel conduits in the same area together on a common rack.
- G. Conduit support:
1. Secure and support conduits in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
 2. Provide required vibration isolation and/or seismic controls in accordance with Structural Sheet S100.
 3. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
 4. Provide support from ceiling support system for installation above suspended ceilings. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
 5. Use conduit strap to support single surface-mounted conduit.
 - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
 6. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
 7. Use conduit clamp to support single conduit from beam clamp or threaded rod.
 8. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
 9. Use non-penetrating rooftop supports to support conduits routed across rooftops (only where approved).
 10. Use of spring steel conduit clips for support of conduits is not permitted.
 - a. Support of electrical metallic tubing (EMT) up to 1" trade size concealed above accessible ceilings and within hollow stud walls.
 11. Use of wire for support of conduits is not permitted.
 - a. For securing conduits to studs in hollow stud walls.
 - b. For suspending conduits supported by spring steel conduit clips (only where specifically indicated or permitted).
 12. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with the most stringent requirements.

H. Connections and terminations:

1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
7. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
8. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

I. Penetrations:

1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Provide suitable modular seal where conduits penetrate exterior wall below grade.
6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
7. Provide metal escutcheon plates for conduit penetrations exposed to public view.
8. Provide firestopping to preserve fire resistance rating of partitions and other elements.

- J. Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
 - 1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 - 2. Where conduits are subject to earth movement by settlement or frost.
- K. Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
 - 1. Where conduits pass from outdoors into conditioned interior spaces.
 - 2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
- L. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12" at each end.

3.3 FIELD QUALITY CONTROL

- A. Correct deficiencies and replace damaged or defective conduits.
- B. Clean interior of conduits to remove moisture and foreign matter.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 27 05 00 - TECHNOLOGY GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General requirements applicable to all Division 27 Sections.

1.2 DEFINITIONS

- A. A/E: Project Architect and/or Engineer.
- B. Furnish: To purchase/supply.
- C. Install: To place in position and connect complete ready for use.
- D. Provide: To furnish and install.

1.3 GENERAL

- A. The contract drawings are a diagrammatic representation of the design intent. They do not show every component required for a complete and operational system. The Contractor shall install complete and operational systems based on the design intent.
- B. The installation shall comply with the contract documents, applicable codes, manufacturer's installation recommendations, published Owner standards, utility company requirements, and requirements of the AHJ.
 - 1. Notify the A/E in writing of any discrepancies in the contract documents and any of the authorities listed above prior to submitting a bid.
 - 2. If there is a discrepancy between manufacturer's installation recommendations and the contract documents, the manufacturer's recommendations shall take precedence.
 - 3. If there are conflicting requirements in the contract documents, the more restrictive requirement shall govern.
- C. Contractor shall apply, procure, and pay for required permits, licenses, inspections, and any other fees.

1.4 EXAMINATION OF CONTRACT DOCUMENTS

- A. The drawings show the design intent diagrammatically. They do not show the exact routing nor every elbow, offset, etc. Do not scale the drawings. The Contractor shall determine the exact installed locations and routing to achieve the design intent. The cost of reasonable adjustments to locations and routing shall be included in the bid. The Contractor shall visit the project site prior to submitting a bid to confirm existing conditions and new work plan of action.
- B. Where discrepancies in quantities or sizes exist in the contract documents the greater number shall govern.
- C. Verify all dimensions at the jobsite prior to ordering any materials.

1.5 SUBMITTALS

- A. Submittals shall be required if requested in applicable specification section or drawings. Submittals will not be reviewed by engineer for specific products if they are not requested in the contract documents.
- B. Contractor shall provide separate submittal packages for each specification section. Submittals including multiple specification sections are not acceptable. All items within an individual specification section shall be provided within a single submittal. Providing multiple submittals for a single specification section is not acceptable unless the project has multiple phases.
- C. Submittals shall be in PDF format. File name shall include the specification number and description of the submitted item.
- D. Content Requirements:
 - 1. Each submittal shall include a cover sheet containing date, project name and number, contractor's name and address, specification number, items submitted, deviations from contract documents, and a blank space for review stamps.
 - 2. Submitted items that have a scheduled equipment tag number on the contract documents shall bear such tag number in the submittal to clearly identify submitted item.
 - 3. Selected options such as model, material, finish, etc. shall be clearly identified.
 - 4. Contractor shall provide review stamp on each submittal, including name of reviewer and date, indicating the content in the submittal has been thoroughly reviewed for completeness and accuracy prior to submitting.
 - 5. Clearly identify deviations, if any, from the contract documents and product or system limitations that may be detrimental to the successful performance of the completed work.
- E. Submittals shall be approved by the A/E prior to ordering items. Approval of submittals does not relieve the contractor's obligation to comply with the contract documents.
- F. The A/E reserves the right to invoice the Contractor for time spent for multiple reviews of submittals that are the result of incomplete, inaccurate, or noncompliant submittals being rejected.

1.6 COORDINATION DRAWINGS

- A. The contract drawings show the design intent diagrammatically. They do not show the exact utility routing nor every elbow, offset, etc. Where required the Contractor shall make adjustments to their systems to avoid conflict with the structure and other disciplines. These adjustments shall be made by the construction team prior to the start of construction during their coordination process.
- B. Prior to installation, the construction team (including all contractors and subcontractors) shall coordinate proposed utility routing, equipment/device locations, code-required and maintenance clearances, etc. amongst each other to ensure no two objects occupy the same space. Such coordination shall be submitted to the A/E and Owner's Representative in the form of an electronic 3D model or 2D floor plans. The Contractor shall notate any conflicts. The A/E will comment on identified conflicts but will not perform coordination for the construction team.

- C. Coordination drawings shall include everything required for a complete installation including, but not limited to, structure, walls, ceilings, equipment, utilities (routing and elevations), components, access panels, hangers, supports, and clearances.
- D. 3D models shall be viewable without the need to purchase specialty software other than the Autodesk AEC Collection.
- E. 2D floor plans shall be submitted in PDF form. Floor plans shall be of a scale that clearly depicts the installation. Plans that are too congested or unclear will not be accepted. Submit each trade on their own floor plan and all trades overlaid onto one combined floor plan. Each trade's work shall have a distinct color to assist in legibility of combined floor plan.
- F. Astral Engineers will provide Revit or AutoCAD electronic files of design models upon request. Such models may be used by contractors as a starting point but must be updated by the construction team during their coordination process. The Contractor shall complete and return waiver (waiver to be provided by Astral Engineers) prior to release of requested documents.
- G. Layout shall be coordinated such that the need for additional access panels is avoided, when possible. Additional access panels beyond those shown in the contract documents must be approved by the A/E. If additional access panels are approved by the A/E, they shall be provided at no additional cost.

- H. Contractor shall coordinate and submit scope of work layout with all overhead utility trades in exposed visible to view ceiling areas for architects review and approval.

1.7 MATERIAL SUBSTITUTION

- A. The Contractor may submit a request for a material substitution for any item made by a manufacturer not listed as an approved manufacturer in the applicable specification. The request shall include enough information for the A/E to determine if the substituted item is of equal or better performance and quality than that listed in the contract documents.
- B. Material substitution requests shall be submitted no later than the last day for pre-bid RFIs.
- C. If a material substitution request is not submitted on time, the Contractor may include the substitution as a voluntary substitution on the bid form. Such substitutions will not be considered in determining the low bidder.
- D. The Contractor that submitted the material substitution is responsible for any additional costs incurred by other Contractors as a result of the alternate product.

1.8 VALUE ENGINEERING

- A. If material or design changes are proposed during construction in an effort to save costs and the Owner agrees to the changes, the Contractor shall pay the design team on a time and material basis to address engineering modifications required.

1.9 WARRANTY

- A. Provide a minimum of one-year parts and labor warranty for all fixtures, equipment, components, materials, and workmanship. Longer warranties may be required for certain systems as noted in other specification sections.
- B. The warranty period shall start on the date of final acceptance by the Owner. If a newly installed system or piece of equipment is needed to operate the building during construction, the

Contractor may agree to a warranty period start date with the Owner that begins prior to the final acceptance of the overall project. The Contractor shall obtain such an agreement in writing from the Owner's Representative.

- C. The Contractor shall adjust the systems at seasonal changes, as needed, during the one-year warranty period to prove satisfactory operation during all seasons.

1.10 CHANGE ORDERS

- A. Submit a detailed material and labor takeoff for each change order. Identify cost additions and credits based on revised scope. Material costs and required labor hours shall closely align with reputable cost estimating publications. Change orders lacking sufficient breakdown of costs and supporting documentation will be rejected.
- B. Do not proceed with change order work until authorized.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

- A. The Contractor is solely responsible for jobsite safety.
- B. Work shall be completed by individuals qualified and competent in that specific task.
- C. Work that will produce excessive noise shall be completed during unoccupied hours. Coordinate schedule of noisy operations with the Owner's Representative.
- D. Install equipment, devices, and components with sufficient clearance to easily maintain parts. Review the final location of equipment with the Owner's Representative prior to setting equipment.
- E. Provide temporary power as needed to support construction activities. Remove temporary power when no longer needed.
- F. Provide temporary heaters as needed to prevent construction site from freezing temperatures and potential damage to temperature-sensitive equipment, components, utilities, etc. Remove temporary heaters when no longer needed.
- G. Thoroughly clean entire project site prior to final turnover to the Owner.

3.2 PRODUCT HANDLING AND STORAGE

- A. The Contractor shall review the required path of travel to navigate equipment, devices, materials, etc. to and from the project area prior to submitting a bid. Overcoming any obstacles shall be accounted for in the bid.
- B. Carefully transport and store equipment, devices, materials, etc. to prevent damage. The Contractor shall replace damaged items at no additional cost.
- C. Paint equipment and devices that are scratched prior to Owner's acceptance. Paint type and color shall match original.

3.3 OCCUPIED BUILDING UNDER CONSTRUCTION IAQ

- A. Coordinate IAQ plan with Owner's Representative throughout construction.
- B. The Contractor shall take steps necessary, including those in SMACNA IAQ Guidelines for Occupied Buildings Under Construction, to minimize construction dust/contaminants in order to limit the impact to the air quality of the adjacent occupied areas.
- C. Construction activities that produce excessive dust shall be completed during unoccupied hours.
- D. The construction site entrance shall not go through the existing building, if possible.
- E. Adhesives and sealants shall be tested and compliant with applicable low emitting materials limits.

3.4 A/E JOBSITE OBSERVATIONS

- A. The Contractor shall provide one full week notice to the A/E prior to making utility installation inaccessible to allow for visual observation of installed work by A/E. Such actions include backfilling over underground utilities or closing walls or ceilings containing utilities.
- B. By notifying the A/E that the underground, above ceiling, or in wall work is ready for observation, the Contractor is certifying that such work is complete and does not require additional work. This includes, but is not limited to, hangers, supports, insulation, identification, and sealed penetrations. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.
- C. IMPORTANT: Astral Engineers must observe the installation of their portion of the design. If observation of such installation is prevented due to the work being covered by backfill, walls, ceilings, etc. prior to observation by Astral Engineers, the Contractor will be required to expose the work so it can be adequately observed.
- D. By notifying the A/E that the construction is complete and ready for the final jobsite observation, the Contractor is certifying that such work is complete and does not require additional work. If the work is not complete and requires additional site visits by the A/E, the Contractor shall pay the A/E for the time and expenses associated with subsequent site visits based on the A/E current billable rates.
- E. Astral Engineers will issue a jobsite observation report after each site visit noting any installation deficiencies, if any. The Contractor shall fix all deficiencies to the satisfaction of the A/E. Provide photographic and/or video evidence of corrected deficiencies signed off if requested by the A/E. The construction schedule shall account for these site visits and required corrections. Schedule extensions will not be allowed to accommodate A/E jobsite observations.

3.5 SYSTEM STARTUP AND TURNOVER

- A. The Contractor shall perform complete system startup, calibration, and testing. See manufacturer startup procedures.
- B. All operating conditions, control sequences, interlocks, and alarms shall be tested during the startup process.
- C. Contractor shall provide verbal and written training for the Owner's representatives regarding the complete maintenance and operation requirements for all systems. Manufacturer personnel shall provide such instruction for major equipment and systems.

3.6 PROJECT CLOSEOUT

A. Operation and Maintenance Manuals:

1. Email a bookmarked electronic copy of the O&M manuals in PDF format to the A/E. All text shall be searchable.
2. Provide the Owner a copy of the O&M manuals on disc or flash drive. Disc or flash drive shall be labeled with project name and "O&M Manual".
3. Content Requirements:
 - a. Provide title page with the project name, Architect, Engineers, Contractors, and major equipment suppliers. Include a point of contact for each entity with telephone numbers and email addresses.
 - b. Provide table of contents with hyperlinks to content within document.
 - c. Provide parts lists, wiring diagrams, control diagrams, operating procedures, and maintenance schedule and procedures for all systems.
 - d. Provide all approved submittals, testing reports, equipment startup reports, factory inspection reports, and warranties.
 - e. Group submittals and other supplemental information with the associated O&M manual to maintain a neat and organized document.

B. Record Documents:

1. The Contractor shall clearly markup drawings to indicate equipment, device, component, and/or utility actual installed location and size. Provide such marked up as-built drawings to A/E at the completion of construction.
2. The Contractor shall clearly markup specifications to indicate any changes to contract specifications based on actual installed conditions. Provide such marked up specifications to A/E at the completion of construction.

END OF SECTION

SECTION 28 05 05 - FIRE ALARM DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Selective demolition.
- B. Patching.

1.2 QUALITY ASSURANCE

- A. Demolition firm shall be a company specializing in the type of work required with a minimum of five years of documented experience.

PART 2 PRODUCTS

2.1 NOT APPLICABLE

PART 3 EXECUTION

3.1 GENERAL

- A. The drawings are diagrammatic and do not show every conduit, fitting, wire, accessory, etc. required to be removed. The Contractor shall visit the site prior to bid submission to verify all field conditions.
- B. Comply with other requirements specified in Divisions 01 and 02.
- C. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Comply with applicable requirements of NFPA 241.
 - 2. Use of explosives is not permitted.
 - 3. Provide, erect, and maintain temporary barriers and security devices.
 - 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 a 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.

- D. Do not begin removal until built elements to be salvaged or relocated have been removed, vegetation to be relocated has been removed, measures have been taken to protect existing conditions to remain, and the Contractor has received notification to proceed from the Owner.
- E. 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.
- F. 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.
- G. Install temporary filters over outside air intakes within 100' of the construction area. If construction activities result in debris affecting existing to remain systems, the Contractor shall completely clean such systems.
- H. If hazardous materials are discovered during removal operations, stop work and notify A/E and Owner's Representative. Hazardous materials include regulated asbestos containing materials, lead, polychlorinated biphenyls, and mercury.
- I. Removal of hazardous materials shall comply with 29 CFR 1926 and state and local regulations.
- J. Perform demolition in a manner that maximizes salvage and recycling of materials.
 - 1. Dismantle existing construction and separate materials.
 - 2. Set aside reusable, recyclable, and salvageable materials. Store and deliver to collection point or point of reuse.

3.2 EXISTING UTILITIES

- A. Coordinate work with utility companies. Notify applicable utility companies before starting work and comply with their requirements.
- B. Protect existing utilities to prevent damage.
- C. Do not disrupt public utilities without permission from the AHJ.
- D. Do not close, shut off, or disrupt existing systems that are in use without at least two weeks prior written notification to Owner's Representative.
- E. Remove conduit, wire, equipment, hangers, supports, and foundations of disconnected and abandoned utilities.
- F. Patch holes resulting from the removal of existing utilities to match existing construction. Provide firestopping as required in fire-rated walls.

3.3 SELECTIVE DEMOLITION

- A. Drawings showing existing construction and utilities are based on nondestructive field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.

2. Report discrepancies to A/E 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. Separate areas in which demolition is being conducted from other areas that are still occupied. Provide, erect, and maintain temporary dustproof, sound retardant partitions separating the construction area and adjacent occupied spaces.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications. Take care to prevent water and humidity damage.
- D. Remove existing systems and equipment as indicated and as required to accomplish new work.
1. Existing systems that serve areas outside of the construction area shall remain active. Maintain access to equipment and operational components. Where existing systems must be shut off to allow for new connections, provide at least two weeks prior written notification to the Owner's Representative.
 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 3. Verify that abandoned services serve only abandoned facilities before removal.
 4. Remove abandoned equipment, conduits, wires, controls, and associated hangers, supports, accessories, etc. including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- E. Protect existing work to remain.
1. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 2. Repair adjacent construction and finishes damaged during removal work.
 3. Patch as specified for patching new work.

3.4 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove all materials not to be reused from site.
- 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

SECTION 32 12 16 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This section compliments and shall be coordinated with the Civil Drawings / requirements and the Geotechnical Report. The most stringent requirements shall be utilized.
- B. Asphaltic Concrete Paving
- C. Aggregates
- D. Surface Sealer
- E. Patching and Repair
- F. Weed Killer
- G. Headers and Stakes
- H. Concrete Wheel Stops
- I. Pavement Striping

1.2 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading: Preparation of site for paving and base.
- B. Section 31 23 23 - Fill: Compacted subgrade for paving.
- C. Section 32 11 23 - Aggregate Base Courses: Aggregate base course.
- D. Section 32 13 13 - Concrete Paving: Concrete curbs.
- E. Section 32 17 23.13 - Painted Pavement Markings: Concrete bumpers.
 - 1. Parking and Traffic Control Pavement Markings.

1.3 REFERENCE STANDARDS

- A. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types; The Asphalt Institute; 1997.
- B. AI MS-19 - A Basic Asphalt Emulsion Manual; The Asphalt Institute; Fourth Edition.
- C. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.
- D. Standard Specifications for Public Works Construction (Greenbook), latest edition.
 - 1. Standard Specifications shall be as amended and adopted by authorities having jurisdiction, including the City or County.
 - 2. Where reference is made to Standard Details, such reference shall be to the Standard Details accompanying the Standard Specifications, as amended, and adopted by the authorities having jurisdiction.
 - 3. Wherever term "Agency" occurs in Standard Specifications, it shall be understood to mean Owner for purposes of the Contract.
 - 4. Wherever term "Engineer" occurs in Standard Specifications, it shall be understood to mean Architect for purposes of the Contract.

1.4 SUBMITTALS

- A. Materials List: List source and quality standard for all asphaltic concrete materials.
- B. Weighmaster's Certificates or certified delivery tickets for each truckload of bituminous material delivered to site.
- C. Certificates of Conformance: Asphalt, aggregate and sterilant materials.
- D. Mix Designs: Submit designs for asphaltic concrete prepared by a materials laboratory under direct supervision of a Civil Engineer licensed in the State of California or a standard mix design proven in actual performance.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with Local Public Works Standards.
- B. Mixing Plant: Conform to Local Public Work Standards.
- C. Testing and analysis of granular base material and asphaltic concrete paving mix shall be performed under provisions of Division 1.
- D. Obtain materials from same source throughout.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for paving work on public property.
- B. Where reference is made to Standard Specifications, the following shall apply.
 - 1. Perform off-site work in the public right-of-way in accordance with requirements of authorities having jurisdiction.
 - a. Including Standard Specifications for Public Works Construction (Greenbook), as amended and adopted by those authorities.
 - b. For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction, including Standard Plans for Public Works Construction, as amended, and adopted by those authorities.
 - 2. Perform on-site work as indicated and referenced on Contract Drawings and as specified herein.
- C. The quantity of volatile organic compounds (VOC) used in weed killer, tack coat, primer and other materials shall not exceed limits permitted under current regulations of South Coast Air Quality Management District (AQMD).

1.7 FIELD CONDITIONS

- A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F (4 degrees C), or surface is wet or frozen; or when rain is imminent.
- B. Place bitumen mixture when temperature is not more than 15 F degrees (9 C degrees) below bitumen supplier's bill of lading and not more than maximum specified temperature.



PART 2 - PRODUCTS

2.1 ASPHALT CONCRETE MIX

- A. Provide hot plant mixed asphaltic concrete paving materials in accordance with Section 203-6 of Standard Specifications for Public Works Construction.
 - 1. Binder Course Mix: B
 - 2. Parking and Drive Aisle Wearing Course: C2
 - 3. Hardscape Play Area Wearing Course: D2
 - 4. Standard Specifications, PG-70-10 or PG-64-10.
 - 5. Standard Specifications, C2-AR-4000.
- B. Use dry material to avoid foaming. Mix uniformly.
- C. Base Course: 3.0 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.
- D. Binder Course: 4.5 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.
- E. Wearing Course: 5 to 7 percent of asphalt cement by weight in mixture in accordance with AI MS-2.

2.2 AGGREGATES

- A. Provide aggregate for base course consisting of angular crushed stone, free of shale, clay, friable material and debris.
- B. Granular base aggregate shall be in accordance with Section 200-2.2 of Standard Specifications for Public Works Construction (Greenbook).
- C. Granular base aggregate maximum size:
 - 1. Base courses 6" thick and under: ¾ inches
 - 2. Base courses over 6" thick: 1-1/2 inches
- D. Aggregates for asphaltic concrete paving shall be in accordance with Section 203.6.2.2 of Standard Specifications for Public Works Construction (Greenbook).

2.3 MATERIALS

- A. General: Aggregate base, prime coat paint binder, bituminous surface course and other materials shall be as noted on the Contract Drawings and shall comply with requirements of authorities having jurisdiction.
- B. Asphalt Cement: ASTM D 946.
- C. Aggregate for Base Course: Angular crushed washed stone; free of shale, clay, friable material and debris.
 - 1. Graded in accordance with ASTM D2487 Group Symbol GW.
 - 2. Crushed Aggregate Base in accordance with Standard Specifications (Greenbook), Sub-Section 200-2.2.
- D. Asphalt Concrete Materials: Standard Specifications (Greenbook), Sub-Section 203-6.
- E. Aggregate for Binder Course: Angular crushed washed stone; free of shale, clay, friable material and debris.

1. Graded in accordance with ASTM D2487 Group Symbol GW.
- F. Aggregate for Wearing Course: Angular crushed washed stone; free of shale, clay, friable material and debris.
 1. Graded in accordance with ASTM D2487 Group Symbol GW.
- G. Fine Aggregate: Sand
- H. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.
- I. Primer: Homogeneous, medium curing, liquid asphalt.
- J. Tack Coat: Emulsified asphalt.
- K. Seal Coat: AI MS-19, slurry type.
 1. Guard Top by Industrial Asphalt Inc., Irwindale, CA.
 2. Satin Seal by Blue Diamond Co., Long Beach, CA.
 3. OverKote by Diversified Asphalt Products, Anaheim, CA.
 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 SOURCE QUALITY CONTROL

- A. Test mix design and samples in accordance with AI MS-2.

2.5 ACCESSORIES

- A. Headers and Stakes: 2 x 6 inch (50 x 305 mm) nominal preservative treated Douglas Fir (PTDF), except at curves provide laminated 1 x 6 inch (25 x 305 mm) nominal preservative treated Douglas Fir. Stakes, 2 x 3 x 18 inch (50 x 150 x 457 mm) long PTDF at 48 inch (1219 mm) on center maximum. Use hot dipped galvanized nails only.
- B. Pavement Reinforcing Fabric: Petromat by Amoco Fabrics and Fibers Co., Austell, GA (800) 445-7732, or approved equal. Non-woven polypropylene fabric conforming to Standard Specifications, Sub-Section 213-1.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Refer to Geotechnical Report referenced in Section 00 31 00 - Available Project Information, provided under separate cover, notes on Contract Drawings, and requirements of authorities having jurisdiction.
- B. Verify that compacted subgrade and granular base is dry and ready to support paving and imposed loads.
- C. Verify gradients and elevations of base are correct.
- D. Fine grading, checking, shaping, and compacting of subgrade shall be complete before start of asphaltic concrete work.
- E. Soil Sterilant: Sterilize soil areas to receive asphaltic concrete paving. Apply soil sterilant in accordance with manufacturer's instructions and applicable environmental regulations. Take care to confine application to the areas to be paved. See Section 32 11 23 - Aggregate Base Courses for product information.

- F. Curbs and Gutters: Gutters shall be in place and cured prior to start of asphaltic concrete work. Provide lumber ramping at all locations where rolling equipment or vehicles cross new concrete paving, curbs and gutters.
- G. Headers: Place headers with tops flush with finish asphaltic concrete surfaces. Back headers with stakes.

3.2 BASE COURSE

- A. Place and compact base course.

3.3 PREPARATION - TACK COAT

- A. Apply tack coat in accordance with manufacturer's instructions.
- B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 0.10 gal/sq yd (0.32 L/sq m).
- C. Apply tack coat to contact surfaces of curbs, gutters and previously placed or existing paving.
- D. Coat surfaces of manhole frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.
- E. Joining Pavement: Expose, cut and clean edges of existing pavement to straight, vertical surfaces for full depth of existing pavement. Paint edge with asphalt emulsion before placing new asphaltic concrete. Joints in new paving shall be in accordance with Standard Specifications.

3.4 PLACING ASPHALT PAVEMENT - SINGLE COURSE

- A. Install work in accordance with the Standard Specifications for Public Works Construction (Greenbook), latest edition, Municipality of the City, or County Public Work's Standards.
- B. Place asphalt within 24 hours of applying primer or tack coat.
- C. Place thickness as indicated on Civil Drawings to minimum 2 inch (51 mm) compacted thickness.
- D. Install gutter drainage grates and frames and manhole frames in correct position and elevation.
- E. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position.
 - 1. Compact (roll) asphaltic concrete in accordance with Standard Specifications (Greenbook), Sub-Section 302-5.6, using machine rollers.
 - a. Compaction by vehicular traffic is prohibited.
 - b. Compact areas inaccessible to rolling equipment with machine-powered tamper.
- F. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.5 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

- A. Install work in accordance with Standard Specifications (Greenbook), Sub-Section 302-5.
- B. Place asphalt binder course within 24 hours of applying primer or tack coat.
- C. Place binder course to thickness of 2 inches minimum (51 mm) compacted thickness.
- D. Place wearing course within two hours of placing and compacting binder course.
- E. Place wearing course to thickness of 2 inches minimum (51 mm) compacted thickness.

- F. Install gutter drainage grates and frames and manhole frames in correct position and elevation.
- G. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position.
 - 1. Compact (roll) asphaltic concrete in accordance with Standard Specifications (Greenbook), Sub-Section 302-5.6, using machine rollers.
 - a. Compaction by vehicular traffic is prohibited.
 - b. Compact areas inaccessible to rolling equipment with machine-powered tamper.
- H. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.6 CURBS

- A. Install extruded asphalt curbs of standard profile as indicated by plan detail or referenced standard detail.

3.7 SEAL COAT

- A. Apply seal coat after surface course application, in accordance with manufacturer's recommendations.
- B. Apply seal coat to surface course and asphalt curbs in accordance with Standard Specifications (Greenbook), Sub-Section 302-8.2.
- C. Add water to specified seal coat material. When air temperatures of 90 degrees F or more are encountered during application, consult manufacturer for recommendations.
- D. If pavement surface exhibits imperfections of roller marks, rock pockets, ridges or depressions as determined by the Architect, the addition of sand aggregate to seal coat, and amounts thereof, shall be as recommended by the manufacturer.
- E. A second application shall be made after first coat has dried to the touch. When sand is added to the first seal coat, two additional coats without extra sand shall be applied.
- F. Allow seal coat to dry before permitting traffic or striping.

3.8 PAVEMENT REPAIR AND PAVING

- A. Preparation of existing pavement: Where indicated, remove loose asphaltic concrete, cleanout "potholes" and cracks, remove dirt, oil and other foreign materials.
- B. Repair holes with full paving section as specified. Repair "alligatoring" with asphalt "skin-patch". Fill all cracks larger than 1/4 inch (6 mm) wide with asphalt emulsion slurry.
- C. Tack Coat: Apply asphalt oil AR-4000 or AR-8000, as required for jobsite condition, at metered application rate of no less than a range from 0.2 to 0.3 gallons per square yard of fabric or as directed by manufacturer and to provide 100 percent fabric saturation and ample bonding for paving section.
- D. Fabric Reinforcement: Place fabric smooth side up in tack coat with 2 to 4 inch overlap. Hand-broom to remove wrinkles. Apply additional tack coat to joints and between overlapped fabric layers.
- E. Overlay Asphalt: Place single course asphalt, 1-1/2 inch (38 mm) compacted thickness, in conformance with specified standards in this section.

3.9 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch (6 mm) measured with 10 foot (3 m) straight edge.
- B. Compacted Thickness: Within 1/4 inch (6 mm) of specified or indicated thickness.
- C. Variation from True Elevation: Within 1/2 inch (12 mm).

3.10 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for quality control.
- B. Provide field inspection and testing. Take samples and perform tests in accordance with AI MS-2.
- C. Test: Flood test all paving to demonstrate positive drainage. No standing water shall remain 1 hour after test.
- D. Asphalt paving used on pedestrian and accessible areas shall be stable, firm, and slip resistant and shall comply with CBC Sections 11B-302 and 11B-403.

3.11 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for 2 days or until surface temperature is less than 140 degrees F (60 degrees C).
 - 1. After final rolling, prohibit all traffic on asphaltic concrete until mix has fully cooled and set. Minimum time, in all cases shall be 6 hours.

3.12 CLEANING

- A. After completion of paving operations, clean all existing and new improvements that have been soiled, especially by oil tracking from asphalt tanks or placement in general.
- B. For Substantial Completion review, broom clean and wash paving with hoses. Clean residue from landscaping installation.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 33 41 11 - SITE STORM DRAINAGE SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Storm drainage piping, fittings, and accessories.
- B. Connection of drainage system to municipal sewers.
- C. Catch basins, Trench drains, Plant area drains, Paved area drainage, Site surface drainage, Detention tank, and Detention basin.

1.2 RELATED REQUIREMENTS

- A. Section 02 32 00- Subsurface Investigations.
- B. Section 03 30 00 - Cast-in-Place Concrete: Concrete for cleanout base pad construction.
- C. Section 31 22 00 - Grading.
- D. Section 31 23 16 - Excavation: Excavating of trenches.
- E. Section 31 23 16.13 - Trenching: Excavating, bedding, and backfilling.
- F. Section 31 23 23 - Fill: Bedding and backfilling.

1.3 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.4 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984 (Reapproved 2014).
- D. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2014.
- E. ASTM C76M - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe [Metric]; 2014.
- F. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets; 2012.
- G. ASTM C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric); 2011.

- H. ASTM D1784 - Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 2011.
- I. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2011.
- J. ASTM D2729 - Standard Specification for Polyvinyl Chloride (PVC) Sewer Pipe and Fittings; 2011.
- K. ASTM D3034 - Standard Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings; 2014.
- L. ASTM D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals; 2007 (Re-approved 2022).
- M. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe; 2014.
- N. ASTM F2787 - Standard Practice for Structural Design of Thermoplastic Corrugated Wall Stormwater Collection Chambers; 2018.
- O. ASTM F2922 - Standard Specification for Polyethylene (PE) Corrugated Wall Stormwater Collection Chambers; 2018e1.
- P. DIN 19580 - Drainage Channels for Vehicular and Pedestrian Areas - Durability, Mass per Unit Area and Evaluation of Conformity; 2010.
- Q. Greenbook: Standard Specifications for Public Works Construction; Latest edition as adopted by local jurisdiction.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the installation of storm drainage with size, location and installation of service utilities.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.6 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating pipe, pipe accessories.
- C. Shop Drawings:
 - 1. For pre-cast concrete manholes, including frames and covers.
 - 2. For cast-in-place concrete or field-erected masonry sanitary manholes, including frames and covers.

- 3. Detention Tank:
 - a. Provide product data and shop drawings indicating the design capacity, layout, per the manufacturer's product design manual and ASTM F2787.
 - b. Indicate: Depth of perimeter stone above, below, and around chamber,
 - c. A structural evaluation by a registered structural engineer that demonstrates that the load factors specified in the AASHTO LRFD Bridge Design Specifications, Section 12.12 are met.
 - 1) The 50-year creep modulus data specified in ASTM F2922 must be used as a part of the AASHTO structural evaluation to verify long-term performance.
 - d. All design specifications for chambers shall be in accordance with the manufacturer's latest design manual.
- D. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
- E. Project Record Documents:
 - 1. Submit documents under provisions of Section 01 78 00 - Closeout Submittals.
 - 2. Record location of pipe runs, connections, catch basins, cleanouts, and invert elevations.
 - 3. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code for materials and installation of the Work of this section.
- B. Comply with requirements of California Plumbing Code and Authorities Having Jurisdiction.
- C. Utility Compliance: Comply with local utility regulations and standards pertaining to storm drainage systems.
- D. Environmental Compliance: Comply with applicable portions of local environmental agency regulations pertaining to storm drainage systems.

1.8 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations. Verify that storm drainage system piping may be installed in compliance with original design and referenced standards.
 - 1. Locate existing storm drainage system piping and structures that are to be abandoned and closed.

1.9 SEQUENCING AND SCHEDULING

- A. Coordinate connection to public storm sewer with utility company.
- B. Coordinate with interior building storm drainage piping.

- C. Coordinate with other utility work.

PART 2 - PRODUCTS

2.1 DRAINAGE PIPE MATERIALS

- A. Provide products that comply with applicable code(s).
- B. Concrete Pipe: Reinforced, ASTM C76 (ASTM C76M), Class IV with Wall type A; mesh reinforcement; inside nominal diameter of 18 to 24 inches (460 to 610 mm), bell and spigot end joints.
- C. Reinforced Concrete Pipe Joint Device: ASTM C443 (ASTM C443M) rubber compression gasket joint.
- E. Plastic Pipe: ASTM D 3034, Type PSM, SDR 35 Polyvinyl Chloride (PVC) material; inside nominal diameter of 4 to 15 inches (100 to 380 mm).
 - 1. Bell and spigot style, push on joints and molded rubber gaskets
 - 2. Maximum pipe length 20'.
- F. Plastic Pipe: ASTM D 679, Polyvinyl Chloride (PVC) material; inside nominal diameter of 18 to 27 inches (457 to 686 mm).
 - 1. Bell and spigot style, push on joints and molded rubber gaskets
 - 2. Maximum pipe length 20 feet.
- G. Refer to Drawings for additional information.

2.2 PIPE ACCESSORIES

- A. Pipe Joints: Mechanical clamp ring type, stainless steel expanding and contracting sleeve, neoprene ribbed gasket for positive seal.
- B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required wyes, bends, cleanouts, reducers, traps and other configurations required.
- C. Filter Fabric: Non-biodegradable, woven. Provide 315ST manufactured by Advanced Drainage Systems, Inc.: www.ads-pipe.com.
- D. Tracer Wire: Magnetic detectable conductor, clear plastic covering, imprinted with " Storm Drain " in large letters.

2.3 CATCH BASIN, TRENCH DRAIN, CLEANOUT, AND AREA DRAIN COMPONENTS

- A. Reinforced cast-in-place concrete, nominal shaft dimension as indicated on Drawings.
- B. Lids and Drain Covers: Cast iron, hinged to cast iron frame.
 - 1. Catch Basin:
 - a. Lid Design: Linear grill.

- b. Nominal Lid and Frame Size: As indicated on Drawings.
 - 2. Cleanout:
 - a. Lid Design: Checkerboard grill.
 - b. Nominal Lid and Frame Size: As indicated on Drawings.
 - 3. Area Drain:
 - a. Lid Design: Linear grill.
 - b. Nominal Lid and Frame Size: As indicated on Drawings.
- C. Sediment Filter: Provide sediment filter compliant with BMP practice for NPDES II, as indicated on Drawings.
 - 1. Product: Storm Water Sediment Control Grate Insert manufactured by Transpo Industries, Inc.: www.transpo.com

D. Drain Basin for Drainage Retention System:

1. General

- a. PVC surface drainage inlets shall include the drain basin type as indicated on the contract drawing and referenced within the contract specifications.
- b. The ductile iron grates for each of these fittings are to be considered an integral part of the surface drainage inlet and shall be furnished by the same manufacturer.
- c. The surface drainage inlets shall be as manufactured by Nyloplast a division of Advanced Drainage Systems, Inc., or prior approved equal.

2. Materials

- a. Drain Basins: PVC pipe stock, utilizing a thermoforming process to reform the pipe stock to the specified configuration.
- b. Drainage Pipe Connection Stubs: PVC pipe stock and formed to provide a watertight connection with the specified pipe system.
- c. Joints: Conform to ASTM D3212 for joints for drain and sewer plastic pipe using flexible elastomeric seals.
 - 1) The flexible elastomeric seals shall conform to ASTM F477.
 - 2) The pipe bell spigot shall be joined to the main body of the drain basin or catch basin.
- d. Surface Drainage Inlets Main Body and Pipe Stubs: Conform to ASTM D1784 cell class 12454.
- e. The grates and frames furnished for all surface drainage inlets shall be ductile iron.
 - 1) Fabricate specifically for each basin so as to provide a round bottom flange that closely matches the diameter of the surface drainage inlet.
 - 2) Grates for drain basins shall be capable of supporting various wheel or live loads as indicated by location.
 - (a) H-20.
 - 3) 12 inch (300 mm) and 15 inch (380 mm) square grates will be hinged to the frame using pins.

- 4) ——— Ductile iron used in the manufacture of the castings shall conform to ASTM A536 grade 70-50-05.
- 5) ——— Grates and covers shall be provided painted black.

- E. Trench Drain System: Trench drain system assembled from factory fabricated, polymer concrete castings in standard lengths and variable depths, with integral joint flanges and integral grating support rails; includes joint gaskets and grating.
1. ——— Basis of Design: ACO Polymer Products, Inc., KlassikDrain; Model as indicated on Drawings: www.aco-online.com.
 2. ——— Load Class: DIN 19580, Class E.
 3. ——— Grating Material and Style: ADA Standards compliant ductile iron.
 4. ——— Basis of Design: ACO Polymer Products, Inc., SlabDrain; Model as indicated on Drawings: www.aco-online.com.
 5. ——— Load Class: DIN 19580, Class A.
 6. ——— Grating Material and Style: ADA Standards compliant ductile iron.
 7. ——— Basis of Design: ACO Polymer Products, Inc., FlowDrain; Model as indicated on Drawings: www.aco-online.com.
 8. ——— Load Class: DIN 19580, Class A.
 9. ——— ADA Standards compliant.
 10. ——— Grating Material and Style: ADA Standards compliant slotted ductile iron.
 11. ——— Basis of Design: ACO Polymer Products, Inc., PowerDrain; Model as indicated on Drawings: www.aco-online.com.
 12. ——— Load Class: DIN 19580, Class D.
 13. ——— Grating Material and Style: ADA Standards compliant slotted ductile iron.
 14. ——— Basis of Design: ACO Polymer Products, Inc., ACO Sport; Model System 3000 – Track Trench Drainage: www.aco-online.com.
 15. ——— Load Class: DIN 19580, Class A.
 16. ——— ADA Compliant.
 17. ——— Grating Material and Style: ADA compliant slotted ductile iron.
 18. ——— Top Finish: Synthetic Surface, see Section 32 1823.33 – Synthetic Track Surfacing.
 19. ——— ADA Compliant.
 20. ——— Trench Width: As indicated on Drawings.

21. Trench Section Length: 39 inches (1 m), and 19-1/2 inches (500 mm).
22. Grating Support Rail: Stainless steel.
23. Accessories:
 - a. Oval to round pipe connection.
 - b. Vertical outlet strainer.

2.4 DETENTION TANK / RETENTION BASIN

- A. Storm water/drainage retention chambers are designed to control storm water runoff.
- B. As a subsurface retention system, storm water/drainage retention chambers retain and allow effective infiltration of water into the soil.
- C. As a subsurface detention system, storm water/drainage retention chambers hold and allow for the metered flow of water to an outfall.
- D. Arch shaped underground storm water storage chamber in a gravel pit:
 1. Manufacturer: Stormtech: www.stormtech.com
 - a. Model, size, and Chamber Storage / Maximum Installed Storage as specified on plan.
 - b. Provide matching end cap.
 2. Live Load Rating: AASHTO LRFD HS-20.
 3. The structural design of the chambers, the structural backfill and the installation requirements shall ensure that the load factors specified in the AASHTO LRFD Bridge Design Specifications, Section 12.12 are met for:
 - a. Long-Duration Dead Loads; and
 - b. Short-duration live loads, based on the AASHTO design truck with consideration for impact and multiple vehicle presence.
 - c. Design shall consider earth and live loads as appropriate for the minimum to maximum specified depth of fill.
 4. Chamber Construction:
 - a. The chamber shall be injection molded of an impact modified polypropylene per ASTM F2418 or polyethylene copolymer per ASTM F2922 to maintain adequate stiffness through higher temperatures experienced during installation and service.
 - b. Chambers shall be designed in accordance with ASTM F2787.
 - c. Chambers shall be designed in accordance with ASTM F2418.
 - d. The chamber shall have a continuously curved section profile.
 - e. The chamber shall be open bottomed.
 - f. The chamber shall incorporate an overlapping corrugation joint system to allow chamber rows of almost any length to be created:
 - 1) The overlapping corrugation joint system shall be effective while allowing a chamber to be trimmed to shorten its overall length.

- g. Chamber rows shall provide continuous, unobstructed internal space with no internal support panels.
- h. Chambers shall have forty-eight orifices penetrating the sidewalls to allow for lateral conveyance of water.
- i. Chamber shall have two orifices near its top to allow for equalization of air pressure between its interior and exterior.
- j. Chamber shall have both of its ends open to allow for unimpeded hydraulic flows and visual inspections down a row's entire length.
- k. Chamber shall have 14 corrugations.
- l. Provide on the top of the chamber a 4-inch (100 mm) diameter inspection port to grade.
 - 1) Product: Nyloplast 12 inch (300 mm) inline drain body with 12 inch (300 mm) solid hinged cover and frame, with concrete collar (4 inch (100 mm) 4 inch (100 mm) thick by minimum 36" cross dimension) with 4 inch (100 mm) schedule 40 screw-in cap. Provide 4 inch (100 mm) schedule 40 PVC pipe into chamber.

5. End Cap Construction

- a. End cap to fit into any corrugation of a chamber, allowing capping of a chamber that has its length trimmed; segmenting rows into storage basins of various lengths.
- b. Provide saw guides for cutting for various diameters of pipe used to inlet the system.
 - 1) End cap shall have structural capacity to allow cutting an orifice of any size at any invert elevation.
- c. Curve primary face of each end cap outward to resist horizontal loads generated near the edges of beds.

E. Geotextile Filter Fabric: Non-biodegradable, non-woven, AASHTO M288 Class 2. Provide Geosynthetics 601T manufactured by ADS Advanced Drainage Systems, Inc.; www.ads-pipe.com.

2.5 BEDDING AND COVER MATERIALS

- A. Bedding: As specified in Section 31 23 16.13.
- B. Cover: As specified in Section 31 23 23.

PART 3 - EXECUTION

3.1 TRENCHING

- A. See Section 31 23 16.13 - Trenching for additional requirements.
- B. Hand trim excavation for accurate placement of pipe to elevations indicated.
 - 1. Correct over excavation in accordance with Section 31 22 00 - Grading.
 - 2. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling or compaction.

- C. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.
- D. Bedding:
 - 1. Excavate pipe trench in accordance with Section 31 23 16.13 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.
 - 2. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6-inch (150 mm) compacted depth, compact to 90 percent.
 - 3. Maintain optimum moisture content of bedding material to attain required compaction density.

3.2 EXAMINATION

- A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.
- B. Inspect piping before installation to detect apparent defects. Mark defective materials with white paint and promptly remove from site.

3.3 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of the underground drainage system piping. Location and arrangement of piping layout take into account many design considerations. Install the piping as indicated, to the extent practical.
 - 1. Install in accordance with Standard Specifications for Public Works Construction (Greenbook), local standards and soils report.
 - 2. Install pipe, fittings and accessories in accordance with ASTM D3034 and manufacturer's instructions. Seal joints watertight.
- B. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's recommendations for use of lubricants, cements, and other installation requirements.
- C. Use fittings for branch connections, except where direct tap into existing sewer or manhole is indicated.
- D. Use proper size increasers and couplings, where different size or material of pipes and fittings are connected. Reduction of the size of piping in the direction of flow is prohibited.
- E. Install piping pitched down in direction of flow, at minimum slope of 2 percent, except where indicated otherwise.
 - 1. Place bell ends of piping facing upstream.

- F. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed, by tunneling, jacking, or a combination of both.

3.4 INSTALLATION - PIPE

- A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.
- B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
1. Plastic Pipe: Also comply with ASTM D2321.
- C. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 10 feet (3 m).
- D. Connect to building storm drainage system, foundation drainage system, and utility/municipal sewer system.
- E. Make connections through walls through sleeved openings, where provided.
- F. Install continuous trace wire 6 inches (150 mm) above top of pipe; coordinate with Section 31 23 16.13.

3.5 INSTALLATION - CATCH BASINS, TRENCH DRAINS AND CLEANOUTS

- A. Install cleanouts as an extension of the storm drain pipe, to cleanout at grade as indicated on plan. Set cleanout frame and cover in concrete block 18 by 18 by 12 inches deep, except where location is in concrete paving. Set top of cleanout 1 inch above surrounding earth grade or flush with grade when installing in paving.
1. Provide as shown on plans or as required by UPC.
- B. Form bottom of excavation clean and smooth to correct elevation.
- C. Form and place cast-in-place concrete base pad, with provision for drainage pipe end sections.
- D. Level top surface of base pad; sleeve concrete shaft sections to receive drainage pipe sections.
- E. Establish elevations and pipe inverts for inlets and outlets as indicated.
- F. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

G. Drain Basin:

1. Install per manufacturer's instructions and detail for H-20 traffic rating
2. The specified PVC surface drainage inlet shall be installed using conventional flexible pipe backfill materials and procedures.

3. The backfill material shall be crushed stone or other granular material meeting the requirements of Class 1 or Class 2 material as defined in ASTM D2321.
4. Bedding and backfill for surface drainage inlets shall be well placed and compacted uniformly in accordance with ASTM D2321.
5. The drain basin body will be cut at the time of the final grade.
6. No brick, stone or concrete block will be required to set the grate to the final grade height.
7. For load rated installations, a concrete slab shall be poured under and around the grate and frame.
8. The concrete slab must be installed taking into consideration local soil conditions, traffic loading, and other applicable design factors.

3.6 — ~~INSTALLATION — DRAINAGE RETENTION TANK (CHAMBER)~~

- A. The installation of chambers shall be in accordance with the manufacturer's latest installation instructions.

3.7 TAP CONNECTIONS

- A. Make connections to existing piping and underground structures so that finished work will conform as nearly as practicable to the requirements specified for new work.
- B. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch overlap, with not less than 6 inches of 3000 psi 28-day compressive-strength concrete.
- C. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris, concrete, or other extraneous material that may accumulate.

3.8 CLOSING ABANDONED STORM DRAINAGE SYSTEM

- A. Abandoned Piping: Close open ends of abandoned underground piping that is indicated to remain in place. Provide sufficiently strong closures to withstand hydrostatic or earth pressure that may result after ends of abandoned utilities have been closed.
 1. Close open ends of concrete or masonry utilities with not less than 8-inch-thick brick masonry bulkheads.
 2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Wood plugs are not acceptable.
- B. Abandoned Structures: Remove structure and close open ends of the remaining piping, or remove top of structure down to not less than 3 feet below final grade; fill structure with stone, rubble, gravel, or compacted dirt, to within 1 foot of top of structure remaining and fill concrete.

3.9 CLEANING

- A. Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.
 - 1. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.
 - 2. Flush piping between manholes, if required by local authority, to remove collected debris.

3.10 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Section 01 40 00.
 - 1. Perform testing of completed site piping in accordance with the California Plumbing Code using water or air pressure test.
- B. Interior Inspection: Inspect piping to determine whether line displacement or other damage has occurred.
 - 1. Make inspections after pipe between manholes and manhole locations has been installed and approximately 2 feet of backfill is in place, and again at completion of project.
 - 2. If inspection indicates poor alignment, debris, displaced pipe, infiltration or other defects correct such defects, and reinspect.
 - 3. Perform video inspection of all piping prior to final acceptance of work.
 - a. All video operations shall be recorded digitally for playback if required.
 - b. All video inspections will include a detailed narrative identifying exact locations of the installed lines and limits of areas to be re-installed.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.11 PROTECTION

- A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION