

TECHNICAL SPECIFICATIONS

PROJECT MANUAL – 1 of 3

For

Ojai Permanent Supportive Housing

611 South Montgomery Street, Ojai, CA., 93023

Permit Set Documents.

Date: 11.07.2025

Prepared For:

Dignity Moves Under City of Ojai

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SECTION 00 01 10

TABLE OF CONTENTS

<u>SECTIONS</u>	<u>PAGES</u>
VOLUME - 01	
DIVISION 00 — PROCUREMENT AND CONTRACTING REQUIREMENTS	
00 00 00 - INTRODUCTION TO PROCUREMENT AND CONTRACTING DOCUMENTS	54
DIVISION 01 — GENERAL REQUIREMENTS	
01 10 00 - SUMMARY	9
01 21 00 - ALLOWANCES	4
01 22 00 - UNIT PRICES	2
01 23 00 - ALTERNATES	3
01 25 00 - SUBSTITUTION PROCEDURES	12
01 26 00 - CONTRACT MODIFICATION PROCEDURES	4
01 29 00 - PAYMENT PROCEDURES	5
01 31 00 - PROJECT MANAGEMENT AND COORDINATION	12
01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION	9
01 32 33 - PHOTOGRAPHIC DOCUMENTATION	5
01 33 00 - SUBMITTAL PROCEDURES	10
01 33 16 - DEFERRED SUBMITTAL	3
01 40 00 - QUALITY REQUIREMENTS	10
01 42 00 - REFERENCES	14
01 43 39 - MOCKUP REQUIREMENTS	5
01 45 23 - TESTING AND INSPECTION	4
01 50 00 - TEMPORARY FACILITIES AND CONTROLS	10
01 56 39 - TEMPORARY TREE AND PLANT PROTECTION	7
01 57 13 - TEMPORARY EROSION AND SEDIMENT CONTROL	3
01 58 00 - PROJECT IDENTIFICATION	2
01 60 00 - PRODUCT REQUIREMENTS	5
01 61 16 - VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS	9
01 73 00 - EXECUTION	11

01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL 7

01 77 00 - CLOSEOUT PROCEDURES 6

01 78 23 - OPERATION AND MAINTENANCE DATA 7

01 78 39 - PROJECT RECORD DOCUMENTS 4

01 79 00 - DEMONSTRATION AND TRAINING 6

01 81 13.72 - SUSTAINABLE DESIGN REQUIREMENTS - CALGREEN 5

01 91 13 - GENERAL COMMISSIONING REQUIREMENTS 17

DIVISION 03 — CONCRETE

03 30 00 - CAST IN PLACE CONCRETE 8

03 35 33 - STAMPED CONCRETE 9

DIVISION 04 — MASONRY

04 02 00 - CONCRETE UNIT MASONRY 7

04 20 00 - UNIT MASONRY 4

DIVISION 05 — METALS

05 50 00 - METAL FABRICATIONS 7

05 52 00 - METAL RAILINGS 6

DIVISION 06 — WOOD, PLASTICS, AND COMPOSITES

06 10 00 - ROUGH CARPENTRY 5

06 12 00 - STRUCTURAL INSULATED PANELS 5

06 16 00 - SHEATHING 2

06 17 53 - METAL-PLATE-CONNECTED WOOD TRUSSES 4

06 18 00 - STRUCTURAL GLUED-LAMINATED TIMBER 3

06 20 13 - EXTERIOR FINISH CARPENTRY 6

06 20 23 - INTERIOR FINISH CARPENTRY 6

06 41 00 - ARCHITECTURAL WOOD CASEWORK 8

06 64 10 - FIBERGLASS REINFORCED PLASTIC WALL PANELS (FRP) 4

DIVISION 07 — THERMAL AND MOISTURE PROTECTION

07 11 13 - BITUMINOUS DAMPPROOFING 3

07 21 00 - THERMAL INSULATION 6

07 25 00 - WEATHER BARRIERS 6

07 26 00 - BELOW GRADE VAPOR RETARDERS 5

07 32 00 - COMPOSITE ROOF TILES9

07 41 13.13 - FORMED METAL ROOF PANELS8

07 62 00 - SHEET METAL FLASHING AND TRIM13

07 84 13 - PENETRATION FIRESTOPPING8

07 92 00 - JOINT SEALANTS7

DIVISION 08 — OPENINGS

08 14 00 - WOOD DOORS9

08 16 13 - FIBERGLASS DOORS AND FRAMES4

08 54 13 - FIBERGLASS WINDOWS7

08 71 00 - DOOR HARDWARE1

08 80 00 - GLAZING9

08 83 00 - MIRRORS5

08 95 16 - WALL VENTS4

DIVISION 09 — FINISHES

09 22 16 - NON-STRUCTURAL METAL FRAMING6

09 24 00 - CEMENT PLASTERING7

09 29 00 - GYPSUM BOARD8

09 50 00 - ACOUSTICAL PANEL CEILINGS4

09 65 13 - RESILIENT BASE AND ACCESSORIES3

09 81 00 - ACOUSTICAL INSULATION4

09 84 00 - ACOUSTIC WALL AND CEILING SYSTEM4

09 91 13 - EXTERIOR PAINTING6

09 91 23 - INTERIOR PAINTING8

09 93 00 - STAINING AND TRANSPARENT FINISHING5

09 97 23 - CONCRETE SEALER AND COATINGS4

DIVISION 10 — SPECIALTIES

10 14 00 - SIGNAGE8

10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES4

10 44 13 - FIRE PROTECTION CABINETS5

10 44 16 - FIRE EXTINGUISHERS3

10 81 13 - BIRD CONTROL SYSTEMS3

DIVISION 11 — EQUIPMENT

11 30 13 - APPLIANCES7

DIVISION 12 — FURNISHINGS

12 36 23.13 - PLASTIC LAMINATE CLAD COUNTERTOPS6

VOLUME - 02

DIVISION 22 — PLUMBING

22 07 00 - PIPING INSULATION5

22 11 13 - PLUMBING PIPING5

22 11 19 - DOMESTIC PLUMBING SPECIALTIES4

22 40 00 - PLUMBING FIXTURES3

DIVISION 23 — HEATING VENTILATING AND AIR CONDITIONING

23 00 00 - PROJECT RECORD DOCUMENTS2

23 05 00 - MECHANICAL REQUIREMENTS3

23 05 29 - SUPPORTS AND ANCHORS3

23 05 53 - MECHANICAL IDENTIFICATION2

23 05 93 - TESTING ADJUSTING AND BALANCING3

23 07 00 - HVAC INSULATION3

23 31 33 - DUCTWORK4

23 33 00 - DUCTWORK ACCESSORIES3

23 37 13 - DIFFUSERS REGISTERS AND GRILLES2

DIVISION 26 — ELECTRICAL

26 00 00 - ELECTRICAL23

DIVISION 31 — EARTHWORK

31 05 13 - SOILS FOR EARTHWORK3

31 05 16 - AGGREGATES FOR EARTHWORK2

31 10 00 - SITE CLEARING2

31 13 13 - TREE PROTECTION AND SELECTIVE TRIMMING2

31 22 13 - ROUGH GRADING3

31 23 16 - EXCAVATION3

31 23 23 - FILL3

31 23 33 - TRENCHING AND BACKFILLING3

DIVISION 32 — EXTERIOR IMPROVEMENTS

32 01 00 - OPERATIONS AND MAINTENANCE OF EXTERIOR IMPROVEMENTS4
32 12 16 - ASPHALT PAVING3
32 13 13 - CONCRETE PAVING6
32 14 13 - PRECAST CONCRETE UNIT PAVING7
32 32 13 - CHAINLINK FENCES AND GATES5
32 80 00 - IRRIGATION9
32 92 00 - TURF AND GRASSES6
32 93 00 - PLANTS6

DIVISION 33 — UTILITIES

33 14 16 - SITE WATER UTILITY DISTRIBUTION PIPING4
33 31 00 - SANITARY SEWERAGE PIPING3
33 42 11 - STORMWATER GRAVITY PIPING3

VOLUME - 03

APPENDIX

01 – SOIL REPORT28

END OF TABLE OF CONTENTS

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REQUEST FOR PROPOSALS (RFP) FOR:

CITY OF OJAI

Permanent Supportive Housing

City of Ojai

November 7, 2025

Community Development Department

Issued by DignityMoves

Proposals Due: January 9, 2026





TABLE OF CONTENTS

1. INTRODUCTION TO PROCUREMENT AND CONTRACTING
2. LIST OF DRAWING SHEETS
3. ADVERTISEMENT FOR SEALED BIDS
4. INSTRUCTIONS TO BIDDERS
5. RESPONSE FORMAT AND SELECTION CRITERIA
6. SUPPLEMENTARY CONDITIONS
7. BID/PROPOSAL CLAUSES

1. INTRODUCTION TO PROCUREMENT AND CONTRACTING DOCUMENTS (00 00 00)

Project Name: Ojai Permanent Supportive Housing

Project Address: 611 South Montgomery Street, Ojai CA 93023

Posting Date: November 7, 2025

Last day for questions: December 12, 2025 at 12:00pm

Proposal Closing: January 9, 2026 at 4:00pm

Project Description: DignityMoves, a non-profit Developer working on behalf of the City of Ojai (City) is requesting proposals from pre-qualified General Contractors for the construction of a 30 unit, permanent supportive housing project using cost effective bio-based construction.

Background: The City is located in Ventura County, approximately 80 miles northwest of Los Angeles, and 35 miles east of Santa Barbara. The City is home to approximately 7,600 residents over 4 square miles. The City incorporated in 1921 and has a mix of new and aging infrastructure, varying in size and design.

2. LIST OF DRAWING SHEETS (00 01 15)

T1 TITLE SHEET

G0.1 ABBREVIATIONS, NOTES LEGENDS

G0.2 CODE NOTES & LIFE SAFETY PLAN

G0.3 NOT USED

G0.4 CAL GREEN CODE NOTES

G0.5 CAL GREEN CODE NOTES

G0.6 ACCESSIBILITY CODE NOTES AND DETAILS

G0.7 ACCESSIBILITY DETAILS

- 1 GRADING PLAN COVER SHEET
- 2 GRADING
- 3 GRADING
- 4 GRADING
- 5 GRADING DETAILS
- 6 GRADING DETAILS
- 7 COMPOSITE UTILITY PLAN
- 8 UTILITY DETAILS
- 9 HORIZONTAL CONTROL PLAN
- 10 EROSION CONTROL PLAN COVER SHEET
- 11 EROSION CONTROL PLAN

- L-0.0 TITLE SHEET
- L-1.0 EXISTING CONDITIONS & DEMO PLAN
- L-2.0 TREE PROTECTION PLAN
- L-2.1 TREE PROTECTION PLAN
- L-3.0 LANDSCAPE SITE PLAN
- L-3.1 LANDSCAPE CONSTRUCTION PLAN
- L-3.2 HARDSCAPE LAYOUT PLAN
- L-3.3 HAND & GUARDRAIL PLAN
- L-3.4 DRAINAGE LAYOUT PLAN
- L-3.5 HARDSCAPE DETAIL PLAN
- L-4.0 MASTER PLANTING PLAN
- L-4.1 MASTER PLANTING SCHEDULE & NOTES
- L-4.2 NORTH PLANTING PLAN & SCHEDULE
- L-4.3 SOUTH PLANTING PLAN & SCHEDULE
- L-4.4 FUEL MODIFICATION ZONE PLAN
- L-4.5 FUEL MODIFICATION ZONE MULCHING PLAN
- L-4.6 FUEL MODIFICATION STANDARDS & GUIDELINES
- L-4.7 HYDROZONE PLAN & MWELO CALCULATIONS
- L-4.8 SOILS REPORT & RECOMMENDATIONS

L-4.9 CAL GREEN MWELO NOTES

L-4.10 PLANTING DETAILS

L-4.11 PLANTING DETAILS

L-5.0 MASTER IRRIGATION PLAN

L-5.1 NORTH IRRIGATION PLAN

L-5.2 SOUTH IRRIGATION PLAN

L-5.3 IRRIGATION SCHEDULES

L-5.4 IRRIGATION DETAILS

L-5.5 IRRIGATION DETAILS

L-5.6 IRRIGATION DETAILS

L-6.0 LANDSCAPE LIGHTING PLAN & SCHEDULE

L-6.1 LANDSCAPE LIGHTING SPEC SHEETS

L-7.0 LANDSCAPE FURNISHING PLAN

A1.1 ARCHITECTURAL SITE PLAN

A2.1 FLOOR PLAN

A2.2 FURNITURE PLAN

A2.3 ROOF PLAN

A2.4 ENLARGED SGLE UNIT PLAN & INT ELEVS

A2.5 ENLARGED DBLE UNIT PLAN & INT ELEVS

A2.6 ENLARGED RESTROOM PLANS & INT ELEVS

A2.7 ARCHITECTURAL CONCRETE FLOOR PLAN

A2.8 TRASH ENCLOSURE & STORAGE CONTAINER

A2.9 DOOR SCHEDULE & TYPES

A2.10 WINDOW SCHEDULE & TYPES

A2.11 FINISH SCHEDULE

A3.0 ASSEMBLY KEYNOTE LEGEND

A3.1 EXTERIOR ELEVATIONS

A3.2 EXTERIOR ELEVATIONS

A3.3 BUILDING SECTIONS

A3.4 WALL SECTIONS

A3.5 WALL SECTIONS

- A3.6 WALL SECTIONS
- A4.X NOT USED
- A5.1 INTERIOR ELEVATIONS
- A6.1 REFLECTED CEILING PLAN
- A6.2 REFLECTED CEILING PLANS UNITS
- A7.X NOT USED
- A8.1 EXTERIOR DETAILS
- A8.2 EXTERIOR DETAILS
- A8.3 EXTERIOR DETAILS
- A8.4 GATE DETAILS
- A9.1 INTERIOR DETAILS

- S1.1 GENERAL STRUCTURAL NOTES
- S1.2 GENERAL STRUCTURAL NOTES
- S2.1 FOUNDATION PLAN
- S2.2 ROOF FRAMING PLAN
- S2.3 TRASH ENCLOSURE & STORAGE BLDG PLANS
- S3.1 FOUNDATION DETAILS
- S3.2 FOUNDATION DETAILS
- S4.1 WOOD FRAMING DETAILS
- S4.2 WOOD FRAMING DETAILS
- S4.3 SIP ROOF FRAMING DETAILS
- S5.1 SITE STRUCTURE DETAILS

- M1.1 ABBREVIATIONS, SYMBOLS & GEN. NOTES
- M1.2 EQUIP. SCHEDULES & COMPLIANCE NOTES
- M1.3 EQUIPMENT SCHEDULES
- M1.4 CA ENERGY CODE COMPLIANCE DOCUMENTS
- M1.5 CA ENERGY CODE COMPLIANCE DOCUMENTS
- M1.6 CA ENERGY CODE COMPLIANCE DOCUMENTS
- M1.7 CA ENERGY CODE COMPLIANCE DOCUMENTS
- M2.1 OVERALL MECHANICAL FLOOR PLAN

- M2.2 ENLARGED MECHANICAL FLOOR PLAN
- M2.3 ENLARGED MECHANICAL FLOOR PLAN
- M2.4 ENLARGED MECHANICAL FLOOR PLANS
- M3.1 DETAILS

- P1.1 ABBREVIATIONS, SYMBOLS, & SCHEDULES
- P1.2 SPECIFICATIONS & DETAILS
- P2.1 OVERALL PLUMBING FLOOR PLAN
- P2.2 ENLARGED PLUMBING FLOOR PLAN
- P2.3 ENLARGED PLUMBING FLOOR PLAN
- P2.4 ENLARGED PLUMBING FLOOR PLAN
- P2.5 ENLARGED PLUMBING FLOOR PLAN
- P3.1 DOMESTIC WATER RISER DIAGRAMS

- E-1 SYMBOLS, NOTES, SCHEDULES & SINGLE LINE DIAGRAM
- E-2 ELECTRICAL SITE PLAN
- E-2.1 SITE LIGHTING PHOTOMETRIC PLAN
- E-3 ELECTRICAL FLOOR PLAN
- E-4 ELECTRICAL FLOOR PLANS

3. NOTICE INVITING SEALED BIDS

Invitation:

DignityMoves, a non-profit Developer working on behalf of the City of Ojai (City) invites sealed bids from the list of pre-qualified General Contractors for the construction of a 30 unit, permanent supportive housing project to provide cost effective bio-based construction. DM and the City plan to work with a single entity/firm in a single phase approach to complete the entire project.

Sealed bids must be submitted the office of the City Clerk, 401 S Ventura St., Ojai, CA 93023 up to 4:00 p.m., on January 9, 2026. The bids will be publicly opened and read at [time TBD] on [date TBD], in the office of the City Clerk, 401 S Ventura St., Ojai, CA 93023.

The term "General Contractor" is abbreviated as Contractor, and "DignityMoves" is abbreviated as DM.

License(s) Required: Class A – General Contractor, Class B General Builder, and/or Specialty Class Contractor’s License appropriate for the class of work described herein. Failure to possess the specified license shall render the bid non-responsive and shall act as a bar to award the contract to any bidder not possessing said license at the time of the award.

At the time the contract is awarded, the contractor shall be properly licensed in accordance with the laws of this state. The first payment for work or material shall not be made unless and until the Registrar of Contractors verifies to the City that the records of the Contractors’ State License Board indicate that the contractor was properly licensed at the time the contract was awarded. Any bidder or contractor not so licensed shall be subject to all legal penalties imposed by law including, but not limited to, any appropriate disciplinary action by the Contractors’ State Board. Failure of the bidder to obtain proper and adequate licensing for an award of a contract shall constitute a failure to execute the contract and shall result in the forfeiture of the security of the bidder. (Public Contract Code § 20103.5)

Prevailing Wage

Required: Yes (per State of California Labor Code Sections 1720-1815)

Bond Requirements: Payment and Performance Bonds on the forms attached to the Development Management Agreement attached hereto will be required by the selected Contractor for any construction work performed.

Skilled and Trained

Workforce: This project is subject to the skilled and trained workforce requirements of the Public Contracts Code §§ 2600 - 2602.

DignityMoves Maureen Boyer, AIA- Developer Project Manager

Contact Person:DignityMoves

maureen@dignitymoves.org

415-246-3510

Please refer to additional requirements described in the attached Form Agreements. This notice shall be considered a part of any contract made pursuant thereto.

Addenda and clarifications, if issued by DignityMoves, will be transmitted by email to all RFP Recipients. Addenda must be acknowledged via email to the DignityMoves Contact Person in addition to a printed and signed version submitted with the proposal response. If addenda are not signed and submitted with the proposal response, the submission may be deemed non-responsive and rejected.

DM and the City will not accept responsibility for incomplete packages or missing addenda. Proposers are cautioned against relying on verbal information in the preparation of proposal responses. All official information and guidance will be provided as part of this solicitation or written addenda. Addenda, if issued by the Agency, will be transmitted via email to all RFP Recipients. Addenda must be digitally acknowledged by email to DM and the City's Contact person in addition to a printed and signed version submitted with the proposal. If addenda are not signed and submitted with the proposal response, the proposal may be deemed non-responsive and rejected.

Date Published: November 7, 2025

4. INSTRUCTIONS TO BIDDERS

A. INSPECTION OF SITE WORK

Bidders are required to inspect the site of the work in order to satisfy themselves, by personal examination or by such other means as they may prefer, of the location of the proposed work and as to the actual conditions of and at the site of work. If, during the course of his/her examination, a bidder finds facts or conditions which appear to him/her to conflict with the letter or spirit of the contract documents, or with any other data furnished him/her, he/she may apply to DM and the City in writing in accordance with 4.D INTERPRETATION OF CONTRACT DOCUMENTS for additional information and explanation before submitting his/her bid.

The submission of a proposal by the bidder shall constitute the acknowledgment that, if awarded the contract, he/she has relied and is relying on his/her own examination of (a) the site of the work, (b) the access to the site, and (c) all other data, matters, and things requisite to the fulfillment of the work and on his/her own knowledge of existing services and utilities on and in the vicinity of the site of the work to be constructed under the contract, and not on any representation or warranty of the DM or the City. No claim for additional compensation will be allowed which is based upon a lack of knowledge of these items.

B. EXAMINATION OF CONTRACT DOCUMENTS

Each bidder shall thoroughly examine and be familiar with legal and procedural documents, general conditions, specifications, drawings and addenda (if any). The submission of a proposal shall constitute an acknowledgment upon which DM and the City may rely that the bidder has thoroughly examined and is familiar with the contract documents. The bidders' attention is directed to the need, if any, for special invoicing for this project. The failure or neglect of a bidder to receive or examine any of the contract documents shall in no way relieve him/her from any obligations with respect to his/her proposal or to the contract. No claim for additional compensation will be allowed which is based upon a lack of knowledge of any contract document.

C. CONTRACT PERIOD/CONSTRUCTION COMPLETION DATE

Bidder's attention is called to the provisions set forth in the Contractor Agreement AIA A104 (Agreement), particularly those pertaining to the contract period.

The Contractor shall begin work within fifteen (15) calendar days after the date of the Notice to Proceed, and shall diligently prosecute said work to completion before the expiration of 6/1/27.

D. INTERPRETATION OF CONTRACT DOCUMENTS

No oral interpretations will be made to any bidder as to the meaning of the contract documents. Requests for an interpretation shall be made in writing and delivered to the DM at least five (5) working days before the time announced for opening the proposals. Interpretations by DM and the City will be in the form of addenda to the contract documents and, when issued, will be sent as promptly as is practical to all parties to whom the contract documents have been issued. DM and the City make no guarantee that all bidders will receive all addenda. Copies of addenda will be made available for inspection at the office where contract documents are on file for inspection as indicated on the Invitation for Bids. All such addenda shall become part of the contract. All questions shall be addressed to Maureen Boyer, DignityMoves, maureen@dignitymoves.org, 415-246-3510.

E. SOIL INFORMATION

Soil remediation required for the site will be addressed under a separate contract/procurement and is excluded from the scope of this proposal. Completion of all remediation activities is expected prior to Council's approval and award of this bid.

F. PROPOSAL

Proposals shall be made on the forms enclosed in Appendix A of these specifications with or without removal from the bound contract documents. All proposals shall give the prices proposed, both in words and in numbers, shall give all other information requested herein, and shall be signed by the bidder or his/her authorized representative, with his/her address. If the proposal is made by an individual, his/her name, signature and mailing address must be shown; if made by firm or partnership, the name and mailing address of the firm or partnership and the signature of at least one of the general partners must be shown; if made by a corporation, the proposal shall show the name of the state under the laws of which the corporation is chartered, the name and mailing address of the corporation, and the name and title of the person who signs on behalf of the corporation. If the proposal is made by a corporation, a certified copy of the bylaws or resolution of the board of directors of the corporation shall be furnished demonstrating the authority of the officer signing the proposal to execute contracts on behalf of the corporation.

Each proposal shall be enclosed in a sealed envelope, labeled as specified in Section 5.A. Bidders are warned against making erasures or alterations of any kind, and proposals which contain omissions, erasures or irregularities of any kind may be rejected. No oral, telegraphic or telephonic proposals or modifications will be considered.

In conformance with the Business and Profession Code, § 7028.15, the Contractor must state clearly his/her license number and expiration date. In addition he/she shall sign a statement that these representations were made under the penalty of perjury. This statement shall be made on APPENDIX I - CERTIFICATIONS.

The Contractor will be required to pay prevailing wage pursuant to California Law, including California Labor Code §§ 1770 et seq.

G. ADDENDA

Each proposal shall include specific acknowledgment in the space provided on APPENDIX I - BID PROPOSAL of receipt of all addenda issued during the bidding period. Failure to so acknowledge may result in the proposal being rejected as not responsive.

H. BID PRICES

Bid prices shall include everything necessary for the completion of construction and fulfillment of the contract including, but not limited to, furnishing all materials, equipment, tools, plant and other facilities and all management, superintendence, labor and services, except as may be provided otherwise in the contract documents. In the event of a difference between a price quoted in words and a price quoted in numbers for the same quotation, the words shall be the amount bid.

In preparing bid prices, bidder represents that he/she has carefully examined the Contract Documents and the site where the work is to be performed and that he/she has familiarized himself with all local conditions and federal, state and local laws, ordinances, rules, and regulations that may affect the performance of the work in any manner. The bidder further represents that he/she has studied all surveys and investigation reports about subsurface and physical conditions pertaining to the job site, that he/she has performed such additional surveys and investigations as he/she deems necessary to complete the work at his/her bid price, and that he/she has correlated the results of all such data with the requirements of the Contract Documents. The submittal of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, including locality, uncertainty of weather and all other contingencies, and as to the character, quality, quantities, and scope of the work.

The plans and specifications for the work show subsurface conditions or otherwise hidden conditions as the Design Engineer supposes or believes them to exist, but is not intended or to be inferred that the conditions as shown thereon constitute a representation that such conditions are actually existent. Except as otherwise specifically provided in the Contract Documents, DM, the City, the Design Engineer and their consultants or agents shall not be liable for any loss sustained by the Contractor as a result of any variance of such conditions as shown on the plans and the actual conditions revealed during the progress of the work or otherwise.

The Contractor shall perform an independent take-off of the plans and bid accordingly. Quantities listed in the BID SCHEDULE in APPENDIX I are intended only as a guide for the Contractor as to the anticipated order of magnitude of work. Contractor shall be responsible for verifying all estimated quantities. Contractor will be reimbursed for the quantity of items actually installed as required by the Contract Documents and shown on the plans to neat line and grade.

The Contractor will not be reimbursed for unauthorized work performed outside of that required by the Contract Documents.

I. TAXES

No mention shall be made in the proposal of sales tax, use tax, or any other tax, as all amounts bid will be deemed and held to include any such taxes which may be applicable.

J. RECOGNITION OF BONDING COMPANIES

All bonding companies used by the Contractor in this contract must be recognized by the Federal Government within Circular 570. All proposals or contracts received that include bonds posted by bonding companies not recognized in Circular 570 will result in the disqualification of the bid proposal and forfeiture of the bid bond.

K. QUALIFICATIONS OF BIDDERS

All bidders have been prequalified as of July 28, 2025 through a competitive request for qualifications. Each bidder shall be skilled and regularly engaged in the general class or type of work called for under the contract. Each bidder shall possess a valid Contractor's License issued by the Contractor's State License Board at the time his/her bid is submitted. The class of license shall be applicable to the work specified in the contract.

No proposer or subcontractor/ subconsultant may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5 [with limited exceptions from this requirement for proposal purposes only under Labor Code Section 1771.1(a)]. No proposer or subcontractor/subconsultant may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

L. DESIGNATION OF SUPPLIERS AND SUBCONTRACTORS

Each proposal shall have listed on the DESIGNATION OF SUPPLIERS AND SUBCONTRACTORS form provided in APPENDIX I, the name, California contractor license number, and Department of Industrial Relations registration number, and address of each subcontractor to whom the bidder proposes to sublet portions of the work in excess of one-half of one percent of the total amount of his/her bid. For the purpose of this paragraph, a subcontractor is defined as one who contracts with the Contractor to furnish materials and labor, or labor only for the performance of work at the site of the work or who will specially fabricate a portion of the work off the site pursuant to detailed drawings in the contract documents.

Public Contract Code § 4104 requires all bidders to list subcontractors and state the license number of all subcontractors who will perform work in excess of one-half of one percent of the total bid, or in the case of streets and highways, one-half of one percent of the total bid or \$10,000, whichever is greater.

Public Contract Code § 6109 prohibits a Contractor from performing work with a subcontractor who is debarred pursuant to Labor Code §§ 1777.1 or 1777.7.

M. PROPOSAL GUARANTEE

The proposal shall be accompanied by a proposal guarantee bond duly completed on the form provided herewith by a guarantee company authorized to carry on business in the State of California for payments to the City in the sum of at least 10% of the total amount of the bid proposal, or alternatively by a certified or cashier's check payable to the City, or cash, in the sum of at least 10% of the total amount of the bid proposal. The amount payable to the City under the proposal guarantee shall be forfeited to the City in case of failure or neglect of the bidder to furnish, execute and deliver to the City the required bonds, evidence of insurance and to enter into, execute and deliver to the City the agreement on the form provided herewith, within ten (10) days after being notified in writing by the City that the award has been made and the agreement is ready for execution.

N. MODIFICATION OF PROPOSAL

A modification of a bid proposal already received will be considered only if the modification is received before the time announced for the opening of bids. All modifications shall be made in writing, executed and submitted in the same form and manner as the original bid proposal.

O. WITHDRAWAL OF PROPOSAL

A proposal may be withdrawn by a written request signed by the bidder. Such requests must be delivered to the DM's designated official prior to the bid opening hour stipulated in SECTION 1 – NOTICE INVITING SEALED BIDS. Proposals may not be withdrawn after that time without forfeiture of the proposal guarantee, except as authorized by Public Contract Code sections 5100 through 5110. The withdrawal of a proposal will not prejudice the right of the bidder to submit a new proposal, providing there is time to do so.

P. POSTPONEMENT OF BID OPENING

DM and the City reserve the right to postpone the date and time for opening of bids at any time prior to the date and time announced in SECTION 1–NOTICE INVITING SEALED BIDS.

Q. DISQUALIFICATION OF BIDDERS

If there is reason to believe that collusion exists among the bidders, none of the bids of the participants in such collusion will be considered. In the event that any bidder acting as a prime contractor has an interest in more than one proposal, all such proposals will be rejected, and the bidder will be disqualified. This restriction does not apply to subcontractors or suppliers who may submit quotations to more than one bidder, and while doing so, may also submit a formal proposal as a prime contractor.

R. REJECTION OF PROPOSALS

DM and the City reserve the right to reject any and all proposals, to waive any irregularity, and to reject any proposals which are incomplete, obscure or irregular; any proposals which omit a bid on any one or more items on which bids are required; which omit unit prices if unit prices are required; in which unit prices are unbalanced in the opinion of the DM and the City; which are accompanied by insufficient or irregular bid security; or which are from bidders who have previously failed to perform properly or to timely complete contracts of any nature.

This RFP does not commit DM and the City to award a contract, or to pay any amount incurred in the preparation of the proposal. DM and the City reserve the right to accept or reject all proposals received as a result of this request, to negotiate with any qualified consultant, or to cancel this RFP in part or in its entirety. DM and the City may require the selected consultant to participate in negotiations and to submit such technical, pricing, or other revisions to their proposal as may result from such negotiations. DM and the City reserve the right to extend the time allotted for the proposal, and to request a best and final offer, should it be in either or both of their best interest to do so.

S. AWARD OF CONTRACT

The Contract will be awarded, if at all, to the lowest responsible and responsive bidder, whose bid proposal is not rejected for cause by the DM and the City. However, until an award is made, DM and the City reserve the right to

reject any or all bids, and to waive technical errors or discrepancies, if to do so is deemed to best serve the interests of the City. In no event will an award be made until all necessary investigations are made as to the responsibility and qualifications of the bidder to whom it is proposed to make such an award. Any successful bidder must be approved by the Ojai City Council prior to final award.

Each bidder's attention is directed to the possibility that the award of the project may be delayed for various reasons. DM and the City reserve the right to delay the award of the project for 60 calendar days. After 60 calendar days, the low bidder may at any time request release from its bid without penalty.

The acceptance of a proposal will be evidenced by a Notice of Award of Contract in writing, delivered by mail to the bidder whose proposal is accepted. No other act of DM and the City shall constitute acceptance of a proposal. The award of contract shall obligate the bidder whose proposal is accepted to furnish a performance bond, payment bond and maintenance bond, as well as evidence of insurance and to execute the contract set forth herein.

The proposal may be awarded in its entirety as proposed; however, DM and the City reserve the right to award elements of the work, independently, and to perform portions "in-house." Additionally, DM and the City reserve the right to award subsequent work on this project based on information presented in this proposal, without recourse to a separate or subsequent RFP process, should it be in its best interest to do so.

Where detailed specifications and/or standards are provided, DM and the City consider them to be material and may accept or reject deviations

T. RETURN OF PROPOSAL GUARANTEES

Within ten (10) calendar days after the bids are opened, the AGENCY will release the proposal guarantees accompanying the proposals which are not to be considered in making the award. Proposal guarantees for the two lowest bidders will be held until the contract has been fully executed, after which they will be returned to the respective bidders.

U. EXECUTION OF CONTRACT

The contract agreement shall be executed in duplicate by the successful bidder and returned, together with the contract bonds and evidence of insurance, within ten (10) calendar days after the notification of the contract award by DM and the City in writing. In case of failure of the successful bidder to execute the contract agreement within ten (10) calendar days after such notice, or any subsequent extension approved by DM and the City, DM and the City at its option may consider the bidder in default, in which case the bid bond or proposal guarantee accompanying the bid shall become the property of the City. After execution by the DM, one original contract shall be returned to the Contractor.

V. FLEXIBILITY OF THE BID SCHEDULE

It is the intent of DM and the City to award a contract to the lowest responsible and responsive bidder and the flexibility shown in the bid schedule is necessary to ensure a project within the DM and the City budget limits and constraints.

W. DELIVERABLES AND GENERAL CONTRACTOR RESPONSIBILITIES

Develop an overall project delivery approach that is completed in consultation with key DM, City staff and stakeholders. The overall project delivery approach should include, but is not limited to, design and value engineering suggestions, cost analyses, projected construction timelines, construction management services, and any other pertinent analysis to be presented/provided to DM and the City for consideration.

Comply with the California Public Contract Code, Government Code, Labor Code, and all applicable City codes, regulations, specifications and design standards.

When hiring sub-contractors, place a priority on qualified local sub-contractors, where feasible.

Manage and administer all sub-contractors' work and provide on-site construction management.

Obtain all permits deemed necessary by the City's Building and Safety Division and Public Works Department.

X. DIGNITYMOVES AND CITY RESPONSIBILITIES

Provide the selected Contractor with needed data where available, including but not limited to: survey reports, and as-builts and/or geotechnical data and existing site conditions data, among other items deemed necessary to ensure the success of this project.

Y. CONTRACT TERMS

Contract terms (contained in the attached AIA A104- 2017), Development Management Agreement, ERF Grant Requirements, Project Conditions and applicable provisions of California Public Contract Code Sections 22030-22045 and Ojai Municipal Code Chapter 8-4) may include, but will not be limited to:

Full documentation of project labor and materials costs, by measure, with negotiated and agreed-upon Contractor mark-ups, fees and profit clearly presented in an open-book pricing/cost structure. Payment and Performance Bonds will be required for construction.

Timetables for completing construction work.

Detailed description of services to be provided.

Z. REPORTS AND MEETINGS

Once the successful Contractor is on board, the following shall occur:

Project Kick-Off Meeting: Introduce staff, provide any background information/data needs of the Contractor, confirm work order and tasks to be performed and discuss expectations, reporting requirements and the communications process.

5. RESPONSE FORMAT AND SELECTION CRITERIA

A. RESPONSE FORMAT

Bids must be prepared in conformance with the instructions herein and submitted in a sealed envelope and plainly marked on the outside:

OJAI PERMANENT SUPPORTIVE HOUSING PROJECT

DO NOT OPEN WITH REGULAR MAIL

The bid must be accompanied by a bid guarantee in the amount of 10% of the total bid by 4:00 p.m. on January 9, 2026. More specifically, pursuant to Public Contract Code §§ 20170 and 20171, all bids for the project shall be presented under sealed cover and shall be accompanied by one of the following forms of bidder's security in the amount of ten percent (10%) of the bid: (a) cash; (b) a cashier's check made payable to the City of Ojai; (c) a certified check made payable to the City of Ojai; or (d) a bidder's bond executed by an admitted surety insurer, made payable to the City of Ojai. Such security shall be forfeited should the successful bidder to whom the contract is awarded fails to timely execute the contract and deliver the necessary bonds and insurance certificates as specified in the contract documents.

To the extent applicable, at any time during the term of the Agreement for the proposed project, the successful bidder may, at its own expense, substitute securities equivalent to the amount withheld as retention (or the retained percentage) in accordance with Public Contract Code § 22300.

Pursuant to California Civil Code § 9550, a payment bond is required to be submitted for all projects estimated in excess of \$25,000.00.

Please see Proposal Instructions 1.10 for details on how to submit.

1.1 **Transmittal Cover Letter**

1.2 **Executive Summary**

1.2.1 Summarize the content of your proposal

1.3 **Identification of Proposer**

1.3.1 Proposer's legal name

1.3.2 Proposer background

1.3.3 Contact person: name, telephone, & email

1.3.4 Corporate and local office address(es)

1.3.5 Proof Respondent meets Minimum Requirements

1.4 **Proposed Scope of Services**

1.4.1 Reflect the scope of work section of this RFP and any suggested deviations (in a separate deviation section).

- 1.4.2 Itemize any service within the scope of the project that are not listed in the Scope of Work (optional)
- 1.4.3 Proposer's methodology to construct the Project.
- 1.4.4 Proposer's approach to managing the program.

1.5 **Personnel**

- 1.5.1 Provide names and specific qualifications, experience, skill set, and appropriate license held by primary staff assigned to the project. Include information regarding primary office location.

1.6 **Work Plan**

- 1.6.1 Provide a detailed work plan summary of how the Proposer will address DM's and the City's objectives and Project requirements.

1.7 **Financial**

- 1.7.1 Provide three (3) most recent audited financial reports. The audited financial report must be for the business entity that would provide a guarantee of performance.
- 1.7.2 Demonstrate the Proposer's financial capacity to carry out this project.
- 1.7.3 Provide a letter from bonding company stating Proposer's bonding limits and bond rating and confirming Proposer has the bonding capacity required by paragraph 4.4 of the Scope of Work
- 1.7.4 Provide a letter from insurer confirming Proposer's insurer will provide insurance coverages required by sample agreements in Section D.
- 1.7.5 Provide a sample of the proposed guarantee document to be used for this project.

1.8 **Statement of Intent**

- 1.8.1 Proposer's response must include the Proposer's name, address, telephone number, fax number, and identify a contact person during the proposal evaluation period. The proposer must include a statement indicating that the Proposal shall remain valid for a period of not less than one hundred twenty (120) days from the date of submittal.

1.9 **Deviations from RFP/Trade Names**

- 1.9.1 Detail any proposed deviations from the scope of services or any other requirements specified in this RFP. In submitting a proposal in response to this RFP, Proposer is certifying that it takes no exceptions to this RFP and that it will accept the terms and conditions of the template Owner Contractor Agreement, and referenced documents (in Section D). If any exceptions are taken, such exceptions must be clearly noted in the proposal and may be reason for rejection of the Proposal. Along with information supplied by the Contractor regarding equivalency of the proposed item, the Contractor shall clearly identify all deviations from the specified item. Deviations discovered by the Engineer after acceptance of an "or equal" item which were not identified by the Contractor with their submittal shall be cause for rejection of the "or equal" item. Contractor shall be due no additional compensation in time or money for acceptance or rejection of a proposed "or equal" item and subsequent replacement with the item specified. Contractor shall pay cost to City and DM

for items requiring more than two submittals and analysis of any shop drawing which requires more than a general review of an “or equal” item. As such, Proposer is directed to carefully review the proposed template AIA A104- 2017, and in particular, the insurance and indemnification provisions therein.

1.10 Proposal Instructions:

- 1.10.1 Proposals/corrections received after the Proposal deadline will not be accepted. DM and the City will not be responsible for proposals not properly or timely delivered. Upon award, all submissions become a matter of public record.
- 1.10.2 A hard-copy proposal and a complete digital copy on a thumb drive in a sealed envelope must be submitted the office of the City Clerk, 401 S Ventura St., Ojai, CA 93023 up to 4:00 p.m., on January 9, 2026. The bids will be publicly opened and read at [time TBD] on [dateTBD], in the office of the City Clerk, 401 S Ventura St., Ojai, CA 93023.

SCHEDULE OF EVENTS (PROPOSED & ANTICIPATED)

RFP Released	By 11:59 p.m. Pacific Standard Time on November 7, 2025
Requests for Clarification & Questions Due	December 12, 2025, before 12:00 p.m.
Preproposal Site Visit	Week of December 8, 2025
Proposal Due Date	January 9, 2025
Final Selection	TBD
City Council Approval	TBD

Unless otherwise specified, all deadlines listed above are before **4:00 p.m. Pacific Standard Time** on the stated date. DM will not consider or accept any late submittals. All dates are subject to change.

6. SUPPLEMENTARY CONDITIONS (00 73 00)

A. SUBCONTRACTORS

Each Bidder shall comply with the Public Contract Code including Sections 4100 through 4113. The following excerpts or summaries of some of the requirements of this Chapter are included below for information:

The Bidder shall set forth in the Bid, as provided in 4104:

“(a) The name, and location of the place of business, the California contractor license number, and public works contractor registration number issued pursuant to Section 1725.5 of the Labor Code of each subcontractor who will perform work or labor or render service to the prime Contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime Contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime Contractor’s total bid, or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 percent of the prime Contractor’s total bid or ten thousand dollars (\$10,000), whichever is greater.”

“(b) The portion of the work which will be done by each such subcontractor under this act. The prime Contractor shall list only one subcontractor for each such portion as is defined by the prime Contractor in his bid.”

Subcontracting of more than one-half of one percent of the work for which no Subcontractor was designated in the original Bid will be allowed only in cases of public emergency or necessity and only after the Engineer makes a written finding of circumstances constituting public emergency or necessity.

The Contractor must obtain written consent of the DM and the City to substitute a Subcontractor designated in the original Bid, to permit any subcontract to be assigned or transferred, or to otherwise allow a subcontract to be performed by anyone other than the originally designated Subcontractor.

A violation of any of the above provisions will be considered a violation of the Contract, and the City may cancel the Contract and collect appropriate damages or assess the Contractor a penalty of not more than ten (10) percent of the subcontract involved.

If subcontracted work is not being performed in a satisfactory manner, the DM or the City will notify the Contractor of the need to take corrective action and the Engineer may report the facts to the City Council. Upon order by City Council and the Contractor's receipt of written instructions from the Engineer, the Subcontractor shall immediately be removed from the Work and may not again be employed on the Work.

The Contractor shall perform, with its own organization, Contract work amounting to at least 50 percent of the Contract Price except that any designated "Specialty Items" may be performed by subcontract and the amount of any such "Specialty Items" so performed may be deducted from the Contract Price before computing the amount required to be performed by the Contractor with its own organization. "Specialty Items" will be identified by the City and DM in the Bid or Proposal. Where an entire item is subcontracted, the value of work subcontracted will be based on the Contract Unit Price. When a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated percentage of the Contract Unit Price. This will be determined from information submitted by the Contractor, and subject to approval by the Engineer.

All persons engaged in the Work, including Subcontractors and their employees, will be considered employees of the Contractor. The Contractor will be held responsible for their work. DM will deal directly and solely with the Contractor and make all payments to the Contractor.

B. CONTRACTOR'S LICENSE

Unless otherwise noted elsewhere in this RFP, if requested and in accordance with the provisions of California Public Contract Code Section 3300, the successful vendor shall submit proof of the required Contractor's License with the proposal response. Failure to possess the required license(s) shall render the proposal non-responsive and shall act as a bar to award the contract to any proposer not possessing

said license at the time of award. As provided for in Section 22300 of the California Public Contract Code, the Contractor may substitute securities for monies withheld by DM and the City to ensure performance under the contract.

C. CITY OF OJAI BUSINESS LICENSE

Successful proposer/Contractor/subcontractors shall apply for a City of Ojai Business License at their own cost. Proof of a City of Ojai Business License shall be provided to DM upon request.

D. PREVAILING WAGES

This contract is subject to the State prevailing wage and apprenticeship requirements of the California Labor Code including, but not limited to, Sections 1770, 1771.5, 1773, 1776 and 1777.5. Contractor shall comply with California prevailing wage laws including, to the extent applicable, Labor Code Section 1720.9. Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available from the California Department of Industrial Relations' Internet web site at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates. A copy of the prevailing rate of per diem wages shall be posted at the job site. Contractor is responsible for obtaining a current edition of all California statutes and regulations, and adhering to the latest editions of such. All public works projects valued at \$30,000 or more must include an obligation to hire apprentices, unless the craft or trade does not require the use of apprentices, as indicated in the corresponding prevailing wage determination. This duty applies to all contractors and subcontractors on a project, even if their part of the project is less than \$30,000.

E. TERMINATION

DM and the City may terminate any purchase, service or contract with or without cause either verbally or in writing at any time without penalty.

1. BID/PROPOSAL CLAUSES

A. DEBARMENT AND SUSPENSION

A.1. Certification Regarding Debarment, Suspension, and Other Responsibility Matters- Lower Tier Covered Transactions. Instructions for certification:

A.1.1. By signing and submitting this bid or proposal, the prospective lower tier participant is providing the signed certification set out below.

A.1.2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, City or DM may pursue available remedies, including suspension and/or debarment.

A.1.3. The prospective lower tier participant shall provide immediate written notice to City and DM if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

A.1.4. The terms “covered transaction,” “debarred,” “suspended,” “ineligible,” “lower tier covered transaction,” “participant,” “persons,” “lower tier covered transaction,” “principal,” “proposal,” and “voluntarily excluded,” as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549 [49 CFR Part 29]. You may contact the City or DM for assistance in obtaining a copy of those regulations.

A.1.5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized in writing by City and DM.

A.1.6. The prospective lower tier participant further agrees by submitting this proposal that it will include the clause titled “Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction”, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

A.1.7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Non-procurement List issued by U.S. General Service Administration.

A.1.8. Nothing contained in the foregoing shall be construed to require establishment of system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

A.1.9. If a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to all remedies available to the Federal government, City or DM may pursue available remedies including suspension and/or debarment.

A.2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction

A.2.1. The prospective lower tier participant certifies, by submission of this bid or proposal, that neither it nor its "principals" as defined at 49 C.F.R suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

A.2.2. When the prospective lower tier participant is unable to certify to the statements in this certification, such prospective participant shall attach an explanation to this proposal.

B. LEGAL RESPONSIBILITIES

B.1. Proposals must be submitted, filed, made, and executed in accordance with State and Federal laws relating to bids for contracts of this nature, whether the same are expressly referred to herein or not. Bidders submitting a proposal shall, by such action thereby, agree to each and all of the terms, conditions, provisions, and requirements set forth, contemplated, and referred to in the plans, specifications, and other contract documents, and to full compliance therewith.

B.2. Additionally, bidders submitting a proposal shall, by such action thereby, agree to pay at least the minimum prevailing per diem wages as provided in Section 1773, et. seq. of the Labor Code for each craft, classification, or type of workman required, as set forth by the Director of Industrial Relations of the State of California. Attention is directed to the Federal minimum wage rate requirements in the books entitled "Proposal and Contract". If there is a difference between the Federal minimum wage rates predetermined by the Secretary of Labor and the State general prevailing wage rate determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the bidder and subcontractors shall pay not less than the higher wage rate.

C. UNFAIR BUSINESS PRACTICES CLAIMS: ASSIGNMENT TO AWARDING BODY

C.1. Pursuant to Section 7103 of the Public Contracts Code, the contract to be awarded will be defined as a "public works contract." In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the bidder or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec 15) or under the Cartwright

Act (Chapter 2 commencing with B-12 Section 16700, of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the bidder, without further acknowledgment by the parties.

D. NONDISCRIMINATION

In the performance of this Contract, bidder shall not discriminate in recruiting, hiring, promotion, demotion, or termination practices on the basis of race, religious creed, color, national origin, ancestry, sex, age, or physical handicap and shall comply with the provisions of the California Fair Employment & Housing Act (Government Code Section 12900, et seq.), the Federal Civil Rights Act of 1964 (P.L. 88-352) and all amendments thereto, Executive Order No. 11246 (30 Federal Register 12319), and all administrative rules and regulations issued pursuant to said Acts and Order. The contractor shall carry out applicable requirements of Title 49 CFR (Code of Federal Regulations) part 26 in the award and administration of US DOT assisted contracts. Bidder shall likewise require each subcontractor to comply with this paragraph and shall include in each such subcontract language similar to this paragraph. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate.

E. SUBCONTRACTOR CLAUSES

E.1. PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS

E.1.1. A prime contractor or subcontractor shall pay to any subcontractor, not later than seven days after receipt of each progress payment, unless otherwise agreed to in writing, the respective amounts allowed the contractor on account of the work performed by the subcontractors, to the extent of each subcontractor's interest therein in accordance with the provision in Section 7108.5 of the California Business and Professions Code concerning prompt payment to subcontractors. In the event that there is a good faith dispute over all or any portion of the amount due on a progress payment from the prime contractor or subcontractor to a subcontractor, the prime contractor or subcontractor may withhold no more than 150 percent of the disputed amount. Any violation of this section shall constitute a cause for disciplinary action and shall subject the licensee to a penalty, payable to the subcontractor, of 2 percent of the amount due per month for every month that payment is not made. In any action for the collection of funds wrongfully withheld, the prevailing party shall be entitled to his or her attorney's fees and costs. The sanctions authorized under this section shall be separate from, and in addition to, all other remedies, either civil, administrative, or criminal. This provision applies to both DBE and non-DBE subcontractors.

E.2. CALIFORNIA DEBARRED CONTRACTORS AND SUBCONTRACTORS

E.2.1. Sections 1720 et seq. of the Labor Code and Section 6109 of the Public Contract Code apply to the Contract, and each potential bidder and Subcontractor is responsible to be in

full compliance with those laws. If a potential bidder or subcontractor has been found by the California Labor Commissioner to be in violation of Section 1720 et seq. of the Labor Code, in accordance with Section 1777.1 of the Labor Code, the potential bidder shall be ineligible to bid or be awarded a contract or to perform work on any City public works project. In accordance with Section 6109 of the Public Contract Code any subcontractor who is ineligible to perform work on a public works project pursuant to Section 1777.1 or 1777.7 of the Labor Code is prohibited from performing work on any City public works project. Pursuant to Section 6109(b) of the Public Contract Code, any contract on a City public works project entered into between a bidder and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any City money for performing work as a subcontractor on a City public works contract, and any City money that may have been paid to a debarred subcontractor by a bidder on the project shall be returned to DM and the City. The bidder shall be responsible for the payment of wages to workers of a debarred subcontractor who has been allowed to work on DM and the City project.

APPENDIX I - FORMS

BID PROPOSAL**OJAI PERMANENT SUPPORTIVE HOUSING PROJECT****IN THE CITY OF OJAI, CALIFORNIA**

DIGNITY MOVES

c/o CITY OF OJAI

401 S. VENTURA ST.

OJAI, CALIFORNIA, 93023

The undersigned, as bidder, declares that he/she has examined all of the contract documents and specifications contained in this project manual for the above referenced project, and that he/she will contract with DignityMoves on the form of contract provided herewith to do everything necessary for the fulfillment of this contract at the price, and on the terms and conditions therein contained.

The following are included and are to be considered as forming a part of this proposal: **BID PROPOSAL, BID SCHEDULE, BID BOND, NONCOLLUSION AFFIDAVIT, BID GUARANTEE** (if submitted in lieu of Bid Bond), **BIDDER INFORMATION, EXPERIENCE STATEMENT, DESIGNATION OF SUPPLIERS & SUBCONTRACTORS, BIDDER'S STATEMENT REGARDING INSURANCE COVERAGE,** and **STATEMENT REGARDING CONTRACTOR'S LICENSING LAWS.**

CONTRACTOR acknowledges receipt and inclusion of addenda _____ to _____ into this bid proposal and the contract documents.

Attached is a Bid Bond duly completed by a guarantee company authorized to carry on business in the State of California in the amount of at least 10% of the total amount of this proposal, or alternatively, there is attached a certified or cashier's check payable to the City of Ojai or evidence of a cash payment to the City, in the amount of at least 10% of the total amount of our proposal.

If this proposal is accepted, we agree to sign the contract form and to furnish the Performance Bond and the Payment Bond (each to be 100% of the bid amount), the Maintenance Bond (to be 50% of the bid amount), and the required evidences of insurance within ten (10) calendar days after receiving written Notice of Award of Contract.

We further agree if our proposal is accepted and a contract for the performance of the work is entered into with the AGENCY, to so plan the work and to prosecute it with such diligence that all of the work shall be completed within the time stipulated the Project Conditions (Section D).

NAME OF BIDDER: _____

MAILING ADDRESS: _____

TELEPHONE NO. _____

STATE CONTRACTOR'S LICENSE NO. _____

STATE OF INCORPORATION: _____

AUTHORIZED SIGNATURE: _____

TITLE: _____

DATE: _____

(If Company is a Corporation, provide corporate resolution)

MAINTENANCE BOND

OJAI PERMANENT SUPPORTIVE HOUSING

IN THE CITY OF OJAI, CALIFORNIA

KNOW ALL PERSONS BY THESE PRESENTS THAT WHEREAS, the City of Ojai, as AGENCY has awarded to CONTRACTOR’s Business Name, as CONTRACTOR, a contract for the above-stated project.

AND WHEREAS, CONTRACTOR is required to furnish a bond in connection with the contract guaranteeing maintenance thereof;

NOW, THEREFORE, we, the undersigned CONTRACTOR and SURETY, are held firmly bound unto AGENCY in the sum of _____ *[DESCRIBE IN WORDS; 50% OF THE TOTAL CONTRACT AMOUNT—TO BE INSERTED BY CONTRACTOR]*, (\$XXX,XXX.XX) Dollars, which is fifty percent (50%) of the total contract amount for the above-stated project to be paid to AGENCY, its successors and assigns, for which payment well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if CONTRACTOR shall remedy without cost to AGENCY any defects which may develop during a period of one (1) year from the date of recordation of the Notice of Completion of the work performed under the contract, provided such defects are caused by defective or inferior materials or work, then this obligation shall be void; otherwise it shall be and remain in full force and effect. In case suit is brought upon this bond, SURETY will pay reasonable attorneys’ fees to the AGENCY in an amount to be fixed by the court.

IN WITNESS WHEREOF the parties hereto have set their names, titles, hands, and seals as of the date set forth below:

CONTRACTOR* CONTRACTOR’s Signer’s Name, Title _____

CONTRACTOR’s Business Name _____

Mailing Street Address _____

City, State, Zip Code _____

Telephone # _____

Date: _____

Surety* Surety Signer's Name / Title _____

Surety's Business Name _____

Mailing Street Address _____

City, State, Zip Code _____

Telephone # _____

Date: _____

*Provide CONTRACTOR and Surety name, address and telephone number and the name, title, address and telephone number for the respective authorized representatives. Power of Attorney and Notary Acknowledgement must be attached. Seals and dates of signing must also be included.

(EXECUTE IN DUPLICATE)

CERTIFICATE OF ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of _____

On _____ before me, _____, personally appeared _____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ (SEAL)

BID BOND

OJAI PERMANENT SUPPORTIVE HOUSING PROJECT

IN THE CITY OF OJAI, CALIFORNIA

KNOW ALL MEN BY THESE PRESENTS that Bidder _____, as PRINCIPAL, and _____, as SURETY, are held and firmly bound unto the City of Ojai as AGENCY, in the penal sum of _____ dollars (\$ _____), which is ten percent (10%) of the total amount bid by PRINCIPAL to AGENCY for the above stated project, for the payment of which sum, PRINCIPAL and SURETY agree to be bound, jointly and severally, firmly by these presents.

The SURETY, for value received, hereby stipulates and agrees that the obligations of said SURETY and its BOND shall be in no way impaired or affected by any extension of the time within which the AGENCY may accept such Bid; and said SURETY does hereby waive notice of any such extension.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH that, whereas PRINCIPAL is about to submit a bid to AGENCY for the above stated project, if said bid is rejected, or if said bid is accepted and a contract is awarded and entered into by PRINCIPAL in the manner and time specified, and PRINCIPAL provides the required payment and performance bonds and insurance coverages to AGENCY, then this obligation shall be null and void, otherwise it shall remain in full force and effect in favor of AGENCY.

IN WITNESS WHEREOF the parties hereto have set their names, titles, hands, and seals this ____ day of _____, 20__.

PRINCIPAL*

SURETY*

*Provide BIDDER and SURETY name, address and telephone number and the name, title, address and telephone number for their authorized representatives. Power of Attorney must be attached.

CERTIFICATE OF ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of _____

On _____ before me, _____, personally appeared _____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ (SEAL)

BIDDER INFORMATION

OJAI PERMANENT SUPPORTIVE HOUSING PROJECT

IN THE CITY OF OJAI, CALIFORNIA

BIDDER certifies that the following information is true and correct:

Name of Bidder: _____

Business Address: _____

Telephone: _____ FAX: _____

E-mail: _____

CONTRACTOR's License No.: _____ Date License Issued: _____

License Expiration Date: _____

The following are the names, titles, addresses, and phone numbers of all individuals, firm members, partners, joint venturers, and/or corporate officers having a principal interest in this proposal:
(Name / Title / Address / Telephone)

Any voluntary or involuntary bankruptcy judgments against any principal having an interest in this proposal are as follows: (Type of Judgment / Date)

All current and prior DBA's, aliases, and/or fictitious business names for any principal having an interest in this proposal are as follows: (Principal / DBA's / Applicable Dates)

Prior Disqualification

Has your firm ever been disqualified from performing work for any City, County, Public or Private Contracting entity? Yes / No _____. If yes, provide the following information. (If more than once, use separate sheets):

Date: _____ Entity: _____

Location: _____

Reason: _____

Provide Status and any Supplemental Statement: _____

Has your firm been reinstated by this entity? Yes / No _____

Violations of Federal or State Law

A. Has your firm or its officers been assessed any penalties by any agency for noncompliance, violations of Federal or State labor laws and/or business or licensing regulations within the past five (5) years relating to your construction projects?

Yes / No: _____ Federal / State: _____

If "yes", identify and describe, (including status): _____

Have the penalties been paid? Yes / No: _____

B. Does you firm or its officers have any ongoing investigations by any agency regarding violations of the State Labor Code, California Business and Professions Code or State Licensing laws?

Yes / No: _____ Codes / Laws: _____ Section / Article: _____

If "yes", identify and describe (including status): _____

I declare under penalty of perjury under the laws of the State of California that all of the representations made in this **BIDDER INFORMATION** are true and correct. Executed this _____ day of _____, 20__, at _____, California.

Authorized Representative: Signature _____

Title _____

BID GUARANTEE

OJAI PERMANENT SUPPORTIVE HOUSING PROJECT

IN THE CITY OF OJAI, CALIFORNIA

Note: The following statement shall be used if other than a bid surety bond accompanies bid.

“Accompanying this proposal is a money order*, certified check*, cashier’s check*, cash*, payable to the order of the City of Ojai in the amount of _____ Dollars (\$_____) which is at least ten percent (10%) of the total amount of this bid. The proceeds of this bid guarantee shall become the property of the City of Ojai provided this bid is accepted by said City, through action of its legally constituted contracting authorities, and the undersigned fails to execute a contract and furnish the required bonds and insurance within the stipulated time. Otherwise, the proceeds of this bid guarantee shall be returned to the undersigned.”

NAME OF BIDDER: _____

MAILING ADDRESS: _____

AUTHORIZED SIGNATURE: _____

TITLE: _____

DATE: _____

(*Delete the inapplicable words)

BID SCHEDULE

OJAI PERMANENT SUPPORTIVE HOUSING PROJECT

IN THE CITY OF OJAI, CALIFORNIA

The cost of all labor, services, material, equipment and installation necessary for the completion of the work itemized under this schedule, even though not shown or specified, shall be included in the unit price for the various items shown herein. For a description of the work associated with each bid item, see **SECTION G—SPECIAL PROVISIONS**. DignityMoves and the City reserve the right to increase or decrease the quantity of any item or omit items as may be necessary, and the same shall in no way affect or void the contract, except that appropriate additions or deductions from the contract total price will be made at the stipulated unit price in accordance with these Contract Documents.

DignityMoves and the City reserve the right to reject any and all bids, to waive any informality in a bid, and to make awards in the interest of the AGENCY.

The CONTRACTOR shall perform an independent take-off of the plans and bid accordingly. Quantities listed in this Bid Schedule are intended only as a guide for the CONTRACTOR as to the anticipated order of magnitude of work. The CONTRACTOR shall be responsible for verifying all estimated quantities. The CONTRACTOR will be reimbursed for the quantity of items actually installed as required by the Contract Documents, including addenda, and shown on the plans to neat line and grade.

The CONTRACTOR will not be reimbursed for work performed for his convenience, or as required to adapt to field conditions, or for unauthorized work performed outside of that required by the Contract Documents.

The CONTRACTOR shall be responsible for calculating and providing totals for the bid schedule. The proposal schedule shall include all costs for labor, services, material, equipment, and installation associated with completing the work in place per the plans, specifications and details.

NAME OF BIDDER: _____

CONTRACTOR’S LICENSE NO.: _____

AUTHORIZED SIGNATURE: _____

TITLE: _____

DATE: _____

BID SCHEDULE (Continued)

**OJAI PERMANENT SUPPORTIVE HOUSING PROJECT
IN THE CITY OF OJAI, CALIFORNIA**

No.	Item Description	Estimated Quantity	Unit	Unit Price	Payment Reference	Item Amount
1						
2						
2						
3						
4						
5						
6						
7						

The CONTRACTOR shall be responsible for calculating and providing unit prices for the schedule. The proposal schedule shall include all costs for services, labor, materials, equipment, and installation associated in completing the work in place per the Specifications and details.

Bid Schedule Total: \$_____

Bid Schedule Total (in words):_____

(Company Name of Bidder)

(Date)

FAITHFUL PERFORMANCE BOND
PERMANENT SUPPORTIVE HOUSING PROJECT
City of Ojai

KNOW ALL PERSONS BY THESE PRESENTS That _____ hereinafter referred to as "CONTRACTOR" as PRINCIPAL, and _____, a corporation duly organized and doing business under and by virtue of the laws of the State of California and duly licensed for the purpose of making, guaranteeing, or becoming sole surety upon bonds or undertakings as Surety, are held and firmly bound unto the CITY OF OJAI, CALIFORNIA, hereinafter referred to as the "CITY" in the sum of \$XX; which is one hundred percent (100%) of the total contract amount for the above stated project, as agreed upon in the contract between DignityMoves and the CITY regarding the same ("Contract"); lawful money of the United

States of America for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, assigns and successors, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that whereas CONTRACTOR through DignityMoves, a California nonprofit corporation, has been awarded and is about to enter into a Contract with DignityMoves to perform all work required by the CITY pursuant to the contract documents for the project entitled: OJAI PERMANENT SUPPORTIVE HOUSING PROJECT, CONTRACT which Contract is by this reference incorporated herein, and is required by CITY to give this Bond in connection with the execution of the Contract between DignityMoves and the CITY;

NOW, THEREFORE, if CONTRACTOR and their Subcontractors shall well and truly do and perform all the covenants and obligations of the Contract on their part to be done and performed at the times and in the manner specified herein including compliance with all Contract specifications and quality requirements, then this obligation shall be null and void, otherwise it shall be and remain in full force and effect;

PROVIDED, that any alterations in the work to be done, or in the material to be furnished, which may be made pursuant to the terms of the Contract, shall not in any way release CONTRACTOR or the Surety thereunder, nor shall any extensions of time granted under the provisions of the Contract release either CONTRACTOR or said Surety, and notice of such alterations of extensions of the Contract is hereby waived by said Surety.

In the event suit is brought upon this Bond by CITY and judgment is recovered, said Surety shall pay all costs incurred by CITY in such suit, including a reasonable attorney's fee to be fixed by the Court.

(Continued on Next Page)

IN WITNESS WHEREOF the parties hereto have set their names, titles, hands, and seals this ____ day of _____, 20__.

CONTRACTOR:

Signer's Name, Title _____

Business Name _____

Mailing Street Address _____

City, State, Zip Code _____

Telephone # _____

SURETY:

Signer's Name, Title _____

Business Name _____

Mailing Street Address _____

City, State, Zip Code _____

Telephone # _____

*Provide CONTRACTOR and SURETY name, address and telephone number and the name, title, address and telephone number for the respective authorized representatives. Power of Attorney must be attached. Signatures must be notarized.

(EXECUTE IN DUPLICATE)

PAYMENT BOND**PERMANENT SUPPORTIVE HOUSING PROJECT****In the City of Ojai, CA**

WHEREAS, the City of Ojai, as AGENCY and [name], as CONTRACTOR, a contract for the above-stated project on behalf of DIGNITYMOVES;

AND WHEREAS, CONTRACTOR is required to furnish a bond in connection with the contract between AGENCY AND DIGNITYMOVES, to secure the payment of claims of laborers, mechanics, material persons, and other persons as provided by law;

NOW THEREFORE, we, the undersigned CONTRACTOR and SURETY, are held and firmly bound unto AGENCY in the sum of \$XXXX which is one hundred percent (100%) of the total contract amount for the above-stated project, for which payment well and truly to be made we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION IS SUCH that if CONTRACTOR, its heirs, executors, administrators, successors, assigns or subcontractors, shall fail to pay any of the persons named in Civil Code Section 9100, or amounts due under the Unemployment Insurance Code with respect to work or labor withheld, and to pay over to the Employment Development Department from the wages of employees of the CONTRACTOR and its subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor, that the surety or sureties herein will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall be void. In case suit is brought upon this bond, SURETY will pay reasonable attorneys' fees to the plaintiffs and AGENCY in an amount to be fixed by the court.

This bond shall inure to the benefit to any of the persons named in Civil Code Section 9100 as to give a right of action to such persons or their assigns in any suit brought upon this bond.

The SURETY hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or the specifications accompanying it shall in any manner affect SURETY's obligations on this bond. The SURETY hereby waives notice of any such change, extension, alteration, or addition and hereby waives the requirements of Section 2845 of the Civil Code as a condition precedent to any remedies AGENCY may have.

IN WITNESS WHEREOF the parties hereto have set their names, titles, hands, and seals this ____ day of _____, 2025.

CONTRACTOR:*Signer's Name, Title _____
Business Name _____
Mailing Street Address _____
City, State, Zip Code _____
Telephone # _____

Surety:* Signer's Name, Title _____
Business Name _____
Mailing Street Address _____
City, State, Zip Code _____
Telephone # _____

*Provide CONTRACTOR and SURETY name, address and telephone number and the name, title, address and telephone number for the respective authorized representatives. Power of Attorney must be attached. Signatures must be notarized.

(EXECUTE IN DUPLICATE)

NOTICE TO PROPOSERS REGARDING CONTRACTUAL REQUIREMENTS

1. SUMMARY OF CONTRACT REQUIREMENTS

- a. A contract is required for any service performed on behalf of DM and the City. Contract language will be negotiated upon acceptance of proposal and prior to commencement of work. Work cannot begin until the contract has been fully executed by both parties.

2. SUMMARY OF INSURANCE REQUIREMENTS

- a. These are the Insurance Requirements for Contractors providing services or supplies to DM and the City. By agreeing to perform the work or submitting a proposal, you verify that you comply with and agree to be bound by these requirements. When Contract documents are executed, the actual Contract language and Insurance Requirements may include additional provisions as deemed appropriate by DM and the City.
- b. It is your responsibility to verify compliance and determine if additional coverage or limits may be needed to adequately insure your obligations under this agreement. These are the minimum required and do not in any way represent or imply that such coverage is sufficient to adequately cover the Contractor's liability under this agreement. The full coverage and limits afforded under Contractor's policies of Insurance shall be available to Buyer and these Insurance Requirements shall not in any way act to reduce coverage that is broader or includes higher limits than those required. The Insurance obligations under this agreement shall be: 1—all the Insurance coverage and limits carried by or available to the Contractor; or 2—the minimum Insurance requirements shown in this agreement, whichever is greater. Any insurance proceeds in excess of the specified minimum limits and coverage required, which are applicable to a given loss, shall be available to City.
- c. Contractor shall furnish DM and the City with original Certificates of Insurance including all required amendatory endorsements and a copy of the Declarations and Endorsement Page of the CGL policy listing all policy endorsements to City before work begins. City reserves the right to require full-certified copies of all Insurance policies in their entirety evidencing required coverage and endorsements.

3. INSURANCE

a. General Insurance Requirements

- i. All insurance shall be primary insurance and shall name City of Ojai, its officers, agents, and employees as an additional insured. The naming of an additional insured shall not affect any recovery to which such additional insured would be entitled under the policy if not named as an additional insured, and an additional insured shall not be held liable for any premium or expense of any nature on the policy or any extension thereof solely because they are an additional insured thereon.
- ii. If the operation under this Agreement results in an increased or decreased risk in the opinion of DM and the City's Risk Manager, then Consultant agrees that the minimum

limits hereinabove designated shall be changed accordingly upon written request by the Risk Manager.

- iii. Contractor agrees that provisions of this Section as to maintenance of insurance shall not be construed as limiting in any way the extent to which Consultant may be held responsible for the payment of damages to persons or property resulting from Contractor's activities, the activities of its subconsultants, or the activities of any person or persons for which Contractor is otherwise responsible.
- iv. A Certificate of Insurance, and an additional insured endorsement (for general and automobile liability), evidencing the above insurance coverage with a company acceptable to DM and the City's Risk Manager shall be submitted to City prior to execution of this Agreement on behalf of DM and the City.
- v. The terms of the insurance policy or policies issued to provide the above insurance coverage shall provide that said insurance may not be amended or canceled by the carrier, for nonpayment of premiums otherwise, without 30 days prior written notice of amendment or cancellation to City. In the event the said insurance is canceled, Contractor shall, prior to the cancellation date, submit new evidence of insurance in the amounts heretofore established.
- vi. All required insurance must be in effect prior to awarding this Agreement, and it or a successor policy must be in effect for the duration of this Agreement. Maintenance of proper insurance coverage is a material requirement of this Agreement, and the failure to maintain and renew coverage or to provide evidence of renewal may be treated by DM and the City as a material breach of contract. If Contractor, at any time during the term of this Agreement, should fail to secure or maintain any insurance required under this Agreement, City shall be permitted to obtain such insurance in Contractor's name at Consultant's sole cost and expense, or may terminate this Agreement for material breach.
- vii. Without limiting any other Consultant obligation regarding insurance, should Consultant's insurance required by this Agreement be cancelled at any point prior to expiration of the policy, Consultant must notify City within 24 hours of receipt of notice of cancellation. Furthermore, Consultant must obtain replacement coverage that meets all contractual requirements within 10 days of the prior insurer's issuance of notice of cancellation. Consultant must ensure that there is no lapse in coverage.

b. General Liability and Property Damage Insurance

- i. Consultant agrees to procure and maintain general liability and property damage insurance at its sole expense to protect against loss from liability imposed by law for damages on account of bodily injury, including death therefrom, and property damage, suffered or alleged to be suffered by any person or persons whomsoever, resulting directly from any act or activities of Consultant, its subconsultants, or any person acting for Consultant or under its control or direction, and also to protect against loss from liability imposed by law for damages to any property of any person caused directly or indirectly

by or from acts or activities of Consultant, or its subconsultants, or any person acting for Consultant, or under its control or direction. Such public liability and property damage insurance shall also provide for and protect City against incurring any legal cost in defending claims for alleged loss. Such general liability and property damage insurance shall be maintained in the following minimum limits: A combined single-limit policy with coverage limits in the amount of \$1,000,000 per occurrence will be considered equivalent to the required minimum limits.

c. Automotive Insurance

- i. Consultant shall procure and maintain public liability and property damage insurance coverage for automotive equipment with coverage limits of not less than \$1,000,000 combined single limit.
- ii. If Consultant does not use automobiles in performing its work under this Agreement, Consultant shall provide a waiver releasing City from all liability resulting from Consultant's use of personal vehicles under this Agreement.

d. Worker's Compensation Insurance

- i. Consultant shall procure and maintain Worker's Compensation Insurance in the amount of \$1,000,000 per occurrence or as will fully comply with the laws of the State of California and which shall indemnify, insure, and provide legal defense for both Consultant and City against any loss, claim, or damage arising from any injuries or occupational diseases happening to any worker employed by Consultant in the course of carrying out this Agreement.

e. Waiver of Subrogation: The insurer(s) agree to waive all rights of subrogation against City, its elected or appointed officers, officials, agents, volunteers and employees for losses paid under the terms of the workers compensation policy which arise from work performed by Consultant for City.

f. Updates to Insurance. City may provide to Consultant reasonable, updated insurance requirements consistent with DM and the City's then-current insurance requirements and Consultant shall comply with any such updated requirements, provided, however, that Consultant's failure to obtain any additional or modified coverage consistent with such updated requirements will not be an Event of Default under this Agreement and Consultant's satisfaction of the original insurance requirements shall suffice unless the updated insurance requirements are required by a Governmental Authority other than DM and the City and are specific to Energy Efficiency upgrades such as those contemplated by this Agreement.

Questions and requests for modification of these terms must be negotiated and approved prior to contract execution and are at the full discretion of DM and the City.

PROPOSER'S CERTIFICATION:

I have read and understand the above requirements and agree to be bound by them for any work performed for DM and the City.

Name of Proposer: _____

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

[Authorized signers for corporations are the chairperson of the board, the president or any vice president and the secretary, any assistant secretary, the chief financial officer or any assistant treasurer of the corporation, in accordance with California Corp Code § 313]

CERTIFICATIONS

TO BE EXECUTED BY ALL PROPOSERS AND SUBMITTED WITH PROPOSAL

The undersigned Proposer certifies to City as set forth in sections 1 through 8, below.

1. STATEMENT OF CONVICTIONS

By my signature hereunder, I hereby swear, under penalty of perjury, that no more than one final, unappealable finding of contempt of court by a Federal Court has been issued against Proposer within the past two years because of failure to comply with an order of a Federal Court or to comply with an order of the National Labor Relations Board.

2. CERTIFICATION OF WORKER'S COMPENSATION INSURANCE

By my signature hereunder, I certify that I am aware of the Labor Code Section 3700, which requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract.

3. CERTIFICATION OF PREVAILING WAGE RATES AND RECORDS

By my signature hereunder, I certify that I am aware of Labor Code Section 1773, which requires the payment of prevailing wage on public projects. Contractor and any subcontractors under the Contractor shall comply with Labor Code Section 1776 regarding wage records, and with Labor Code Section 1777.5 regarding the employment and training of apprentices. Contractor is responsible to ensure compliance by any and all subcontractors performing work under this Contract.

4. CERTIFICATION OF COMPLIANCE WITH PUBLIC WORKS CHAPTER OF LABOR CODE

By my signature hereunder, I certify that I am aware of Labor Code Sections 1777.1 and 1777.7 Code, and Contractor and Subcontractors are eligible to bid and work on public works projects.

5. CERTIFICATION OF NON-DISCRIMINATION

By my signature hereunder, I certify that there will be no discrimination in employment with regard to race, color, religion, gender, sexual orientation, age or national origin; that all federal, state, and local directives and executive orders regarding non-discrimination in employment will be complied with; and that the principal of equal opportunity in employment will be demonstrated positively and aggressively.

6. CERTIFICATION OF NON-DISQUALIFICATION

By my signature hereunder, I swear, under penalty of perjury, that the below indicated Proposer, any officer of Proposer, or any employee of Proposer who has a proprietary interest in such Proposer, has never been disqualified, removed, or otherwise prevented from bidding on, or completing a Federal, State, or local government project because of a violation of law or safety regulation, except as indicated on the separate sheet attached hereto entitled "Previous Disqualifications." If a statement of "Previous Disqualifications" is attached, please explain the circumstances.

7. CERTIFICATION OF ADEQUACY OF CONTRACT AMOUNT

By my signature hereunder, pursuant to Labor Code Section 2810(a), I certify that, if awarded the Contract based on the undersigned’s Proposal, the Contract will include funds sufficient to allow the Proposer to comply with all applicable local, state, and federal laws or regulations governing the labor or services to be provided. I understand that City will be relying on this certification if it awards the Contract to the undersigned.

8. CERTIFICATION REGARDING DIR CONTRACTOR / SUBCONTRACTOR REGISTRATION

By my signature hereunder, I certify that any Contractor, and all Subcontractors utilized in carrying out the Contract shall be the subject of current and active contractor registrations pursuant to Division 2, Part 7, Chapter 1 (commencing with section 1720) of the California Labor Code.

PROPOSER’S CERTIFICATION:

I declare under penalty of perjury under the laws of the State of California that all of the representations made in this **EXPERIENCE STATEMENT** are true and correct. Executed this _____ day of _____, 20__, at _____, California.

Name of Proposer: _____

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

[Authorized signers for corporations are the chairperson of the board, the president or any vice president and the secretary, any assistant secretary, the chief financial officer or any assistant treasurer of the corporation, in accordance with California Corp Code § 313]

NON-COLLUSION AFFIDAVIT

(Title 23 United States Code Section 112 and Public Contract Code Section 7106)

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106, the Bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the Bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the Bidder has not, directly or indirectly, submitted his, her or its bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

THE BIDDER'S EXECUTION ON THE SIGNATURE PORTION OF THE "BIDDER'S CERTIFICATION" SHALL ALSO CONSTITUTE AN ENDORSEMENT AND EXECUTION OF THOSE CERTIFICATIONS WHICH FORM A PART OF THE PROPOSAL. BIDDERS ARE CAUTIONED THAT MAKING A FALSE CERTIFICATION MAY SUBJECT THE CERTIFIER TO CRIMINAL PROSECUTION.

PROPOSER'S CERTIFICATION:

Name of Proposer: _____

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

[Authorized signers for corporations are the chairperson of the board, the president or any vice president and the secretary, any assistant secretary, the chief financial officer or any assistant treasurer of the corporation, in accordance with California Corp Code § 313]

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Name, License No., and Address of Subcontractor	Employer Tax Id #	MBE/WBE (Y/N)	Work Subcontracted	Portion of Work (% of Contract Price)

These representations are made under the penalty of perjury under the laws of the State of California. The undersigned hereby certifies that each subcontractor has been notified in writing of its equal opportunity obligations.

NAME OF BIDDER: _____

AUTHORIZED SIGNATURE: _____

Date: _____

STATEMENT REGARDING CONTRACTOR'S LICENSING LAWS**OJAI PERMANENT SUPPORTIVE HOUSING PROJECT****IN THE CITY OF OJAI, CALIFORNIA**

[Business & Professions Code § 7028.15]

[Public Contract Code § 20103.5]

I, the undersigned, certify that I am aware of the following provisions of California law and that I, or the entity on whose behalf this certification is given, hold a currently valid California CONTRACTOR's license as set forth below:

Business & Professions Code § 7028.15:

- a) **It is a misdemeanor for any person to submit a bid to a public agency to engage in the business or act in the capacity of a CONTRACTOR within this state without having a license therefor**, except in any of the following cases:

(1)The person is particularly exempted from this chapter.

(2)The bid is submitted on a state project governed by Section 10164 of the Public Contract Code or on any local agency project governed by Section 20104 [now § 20103.5] of the Public Contract Code.

- b) If a person has been previously convicted of the offense described in this section, the court shall impose a fine of 20 percent of the price of the contract under which the unlicensed person performed contracting work, or four thousand five hundred dollars (\$4,500), whichever is greater, or imprisonment in the county jail for not less than 10 days nor more than six months, or both.

In the event the person performing the contracting work has agreed to furnish materials and labor on an hourly basis, "the price of the contract" for the purposes of this subdivision means the aggregate sum of the cost of materials and labor furnished and the cost of completing the work to be performed.

- c) This section shall not apply to a joint venture license, as required by Section 7029.1. However, at the time of making a bid as a joint venture, each person submitting the bid shall be subject to this section with respect to his/her individual licenser.
- d) This section shall not affect the right or ability of a licensed architect, land surveyor, or registered professional engineer to form joint ventures with licensed CONTRACTORs to render services within the scope of their respective practices.
- e) Unless one of the foregoing exceptions applies, a bid submitted to a public agency by a CONTRACTOR who is not licensed in accordance with this chapter shall be considered nonresponsive and shall be rejected by the public agency. Unless one of the foregoing exceptions applies, a local public agency shall, before awarding a contract or issuing a purchase order, verify that the CONTRACTOR was properly licensed when the CONTRACTOR submitted the bid. Notwithstanding any other provision of law, unless one of the foregoing exceptions applies, the registrar may issue a citation to any public officer or employee of a public entity who knowingly awards a contract or issues a purchase order to a CONTRACTOR who is not

licensed pursuant to this chapter. The amount of civil penalties, appeal, and finality of such citations shall be subject to Sections 7028.7 to 7028.13, inclusive. **Any contract awarded to, or any purchase order issued to, as CONTRACTOR who is not licensed pursuant to this chapter is void.**

- f) Any compliance or noncompliance with subdivision (e) of this section, as added by Chapter 863 of the Statutes of 1989, shall not invalidate any contract or bid awarded by a public agency during which time that subdivision was in effect.
- g) A public employee or officer shall not be subject to a citation pursuant to this section if the public employee, officer, or employing agency made an inquiry to the board for the purposes of verifying the license status of any person or CONTRACTOR and the board failed to respond to the inquiry within three business days. For purposes of this section, a telephone response by the board shall be deemed sufficient.

Public Contract Code § 20103.5:

In all contracts subject to this part where federal funds are involved, no bid submitted shall be invalidated by the failure of the bidder to be licensed in accordance with the laws of this state. However, at the time the contract is awarded, the CONTRACTOR shall be properly licensed in accordance with the laws of this state. The first payment for work or material under any contract shall not be made unless and until the Registrar of CONTRACTORS verifies to the AGENCY that the records of the Contractors' State License Board indicate that the CONTRACTOR was properly licensed at the time the contract was awarded. Any bidder or CONTRACTOR not so licensed shall be subject to all legal penalties imposed by law, including, but not limited to, any appropriate disciplinary action by the Contractors' State License Board. The AGENCY shall include a statement to that effect in the standard form of pre-qualification questionnaire and financial statement. **Failure of the bidder to obtain proper and adequate licensing for an award of a contract shall constitute a failure to execute the contract and shall result in the forfeiture of the security of the bidder.**

CONTRACTOR's License Number: _____

License Expiration Date: _____

Authorized Signature: _____

Date: _____

STATEMENT REGARDING INSURANCE COVERAGE

OJAI PERMANENT SUPPORTIVE HOUSING PROJECT

IN THE CITY OF OJAI, CALIFORNIA

The undersigned representative of Bidder hereby certifies that he/she has reviewed the insurance coverage requirements specified in this bid. Should Bidder be awarded the contract for the work, the undersigned further certifies that Bidder can meet all of these specification requirements for insurance including insurance coverage of his/her subcontractors.

NAME OF BIDDER: _____

MAILING ADDRESS: _____

AUTHORIZED SIGNATURE: _____

TITLE: _____

DATE: _____

ENDORSEMENTS TO INSURANCE POLICY

Name of Insurance Company: _____

Policy Number: _____

Effective Date: _____

The following endorsements are hereby incorporated by reference into the attached Certificate of Insurance as though fully set forth thereon:

1. The naming of an additional insured as herein provided shall not affect any recovery to which such additional insured would be entitled under this policy if not named as such additional insured, and
2. The additional insured named herein shall not be held liable for any premium or expense of any nature on this policy or any extensions thereof, and
3. The additional insured named herein shall not by reason of being so named be considered a member of any mutual insurance company for any purpose whatsoever, and
4. The provisions of the policy will not be changed, suspended, canceled or otherwise terminated as to the interest of the additional insured named herein without first giving such additional insured twenty (20) days' written notice.
5. Any other insurance held by the additional insured shall not be required to contribute anything toward any loss or expense covered by the insurance, which is referred to by this certificate.
6. **The company provided insurance for this certificate is a company licensed to do business in the State of California with rating of "A" or higher and a Financial Class VII or higher as established by A.M. Best, or higher rating established by Moody's or Standard & Poor's.**

It is agreed that the City of Ojai, its officers and employees, are included as Additional Insureds under the contracts of insurance for which the Certificate of Insurance is given.

Authorized Insurance Agent

Date: _____

APPENDIX II

SAMPLE CONTRACTS AND REFERENCED DOCUMENTS

D.1 - Sample Owner Contractor Agreement AIA A104- 2017 Version

D.2 – Development Management Agreement

D.3 – ERF Grant

D.4 – Project Conditions

D.5 – Worker’s Compensation Insurance Certificate

D.6 – Insurance Endorsement

APPENDIX III
PROJECT CONSTRUCTION DOCUMENTATION

Included in separate link to this invitation to bid.

SECTION 01 10 00 –

SUMMARY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Appendix A “Standard Specifications”, outlining the requirements from GreenBook for Public Work Construction applies to the entire project.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work under Owner's separate contracts.
4. Owner-furnished/Owner-installed (FOIO) products.
5. Contractor's use of site and premises.
6. Coordination with occupants.
7. Work restrictions.
8. Specification and Drawing conventions.
9. Miscellaneous provisions.

B. Related Requirements:

1. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
2. Appendix – A “Standard Specifications”, for green book requirements and references. The green book requirements are applicable to the entire project.

1.3 DEFINITIONS

- A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.
- B. Owner: The Owner is the person or entity identified in the Agreement and is referred to throughout the Contract Documents as if singular in number.
- C. Contractor: The Contractor is the person or entity identified as such in the Agreement as is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed in the jurisdiction where the Project is located.

1.4 PROJECT INFORMATION

- A. Project Identification: Ojai Permanent Supportive Housing.

1. Project Location: 611 South Montgomery Street, Ojai California, 93023.
- B. Owner: City of Ojai.
 1. Owner's Representative: Ben Harvey, City Manager, email: ben.harver@ojai.ca.gov
- C. Architect: DJA Architects, PLLC
 1. Contact: Dylan Johnson.
 2. Email: Dylan@djaarchitects.com
 3. Contact: 206.459.7027
- D. Developer: Dignity Moves
 1. Contact: Maureen Boyer
 2. Email: maureen@dignitymoves.org
 3. Contact: 415.246.3510
- E. Web-Based Project Software: Project software will be used for purposes of managing communication and documents during the construction stage.
 1. See Section 01 31 00 "Project Management and Coordination" for requirements for using web-based Project software.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
 1. The proposed project entails the development of a permanent supportive housing project for formerly unhoused individuals containing 30 single story residential units with required utilities in addition to associated sitework, landscaping and utilities and other Work indicated in the Contract Documents.
- B. Type of Contract:
 1. Project will be constructed under a single prime contract.
- C. The Work of the Contract includes but is not necessarily limited to:
 1. New site and building construction and additions indicated.
 2. Construction phasing and barricading of work areas as required to separate construction areas from occupied spaces and as needed to accommodate the Owner's schedule and use of the site.
 3. All other work as shown in the Contract Documents.
- D. The Work includes all labor, materials and equipment necessary for the Contractor to fulfill all of its obligations pursuant to the Contract Documents, including but not limited to:
 1. Home office overhead,
 2. Off-Site supervision,
 3. Project Administration including preparation, research and distribution of project correspondence and submittals,
 4. Schedule preparation and maintenance,
 5. Guarantees and warranties,
 6. On-Site supervision,

7. Temporary protection,
8. Temporary utilities and facilities, including mobilization and demobilization,
9. Material handling and storage,
10. Safety equipment,
11. Travel time to and from the Site to the Contractor's home office.

- E. Sequence the Work subject to the Owner's use of the site, the requirements of the Construction Phasing, Technical Specifications and the Contract provisions for Time of Completion found elsewhere in these documents.
- F. Provide materials and perform work indicated or required to produce finished results shown.
- G. Contractor shall coordinate all work and shall be responsible for division of work among the various subcontractors.
1. Coordinate the work of this Contract with the activities of the Owner, local agencies and serving utilities.
- H. Laws, Codes and Regulations: Intent of the Contract Documents is to construct the Work shown therein, in accordance with applicable laws, codes and regulations.

1.6 WORK UNDER OWNER'S SEPARATE CONTRACTS

- A. Work with Separate Contractors: Cooperate fully with Owner's separate contractors, so work on those contracts may be carried out smoothly, without interfering with or delaying Work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under Owner's separate contracts.
- B. Owner reserves the right to issue other contracts for work on the site which may be constructed concurrently with these Contracts.
- C. Hazardous materials removal or abatement will be performed by the Owner's separate contractor.
1. This work will be performed concurrently with this contract in the event that hazardous materials are encountered.
 2. These Contract Documents do not contain necessary components for removal or abatement of hazardous materials.

1.7 OWNER-FURNISHED/OWNER-INSTALLED (FOIO) PRODUCTS

- A. The Owner will furnish and install products indicated.
- B. Owner-Furnished/Owner-Installed (FOIO) Products: The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products and making building services connections.
- C. Owner-Furnished Products: As shown on the Drawings and as specified.

1.8 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Unrestricted Use of Site: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to area approved by the Architect. If additional storage is necessary, Contractor shall obtain and pay for such storage off site without additional expense to the Owner.

1. Move stored products, temporary facilities, controls or fencing, under Contractor's control, which interfere with operations of the Owner or separate contractors, on or off the site, without cost to the Owner.
2. Do not overload structures with weight that will endanger them.
- C. Assume full responsibility for protection and safekeeping of materials and tools stored at the site. Lock vehicles such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.
- D. Perform site access activities, including arrival and departure of workers, deliveries, storing, handling and removal of materials, equipment, and debris to minimize dust, mud or accumulated debris, or undue interference with the convenience, sanitation or routine of Owner's activities.
- E. Time and coordinate cutovers and connection of new utilities to existing systems and other similar activities to avoid interference with or interruption of Owner's activities.
- F. Protect existing finished work remaining in place from damage due to construction activities. Repair and replace finished work damaged by activities of this contract to match adjacent undamaged work to the satisfaction of Owner and Architect at no extra cost to the Owner.
 1. Protect improvements on adjoining properties as well as those on the Owner's property.
 2. Restore all improvements damaged by this work to their original condition as acceptable to the owner of the improvement
- G. Assume responsibility for safety and support of structures. Cease operations and notify Architect immediately if safety of structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored. Assume liability for such movement, settlement, damage or injury.
- H. Provide, erect and maintain barricades and guard rails as required by governing regulatory agencies to protect occupants of building and workers. Refer to other pertinent sections of Division 01.

1.9 COORDINATION WITH OCCUPANTS

- A. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
 3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.10 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

2. Comply with all Project Conditions approved by the City of Ojai, Exhibit G of the AIA A104 Contract for Construction.
- B. On-Site Work Hours: Limit work on site to normal business hours., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.
1. Weekend and Early Morning Hours: Restrictions on times permitted in accordance with regulations by authorities having jurisdiction for restrictions on noisy work.
 2. Hours for Utility Shutdowns: Per Owner's restrictions.
 3. Hours for Core Drilling and noisy activity: Per Owner's restrictions and regulations by authorities having jurisdiction for restrictions on noisy work.
- C. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
1. Notify Architect and Owner not less than two days in advance of proposed disruptive operations.
 2. Obtain Architect's and Owner's written permission before proceeding with disruptive operations.
- D. Smoking and Controlled Substance Restrictions: Use of tobacco products , alcoholic beverages, and other controlled substances on Project site is not permitted.

1.11 CORRELATION AND INTENT

- A. Correlation and Intent: Contract Documents are Complementary and Inclusive.
1. The Contract Documents are complementary and are intended to include all items required for the proper execution and completion of the Work.
 2. All items of work mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be provided by Contractor as if shown or mentioned in both.
- B. Coverage of the Drawings and Specifications:
1. The Drawings and Specifications generally describe the work to be performed by Contractor. Generally, the Specifications describe work which cannot be readily indicated on the Drawings and indicate types, qualities, and methods of installation of the various materials and equipment required for the Work.
 2. It is not intended to mention every item of Work in the Specifications, which can be adequately shown on the Drawings, or to show on the Drawings all items of Work described or required by the Specifications even if they are of such nature that they could have been shown.
- C. Provide all materials or labor for Work, which is shown on either by the Drawings or the Specifications (or is reasonably inferable as necessary to complete the Work), whether or not the Work is expressly covered in either the Drawings and/or the Specifications.
- D. Work is intended to be of sound, quality construction. Include adequate amounts to cover installation of all items indicated, described, or implied in Contract Documents.
- E. Conflicts: In the event there is a discrepancy between the various Contract Documents, the Owner/Contractor Agreement shall control. Without limiting Contractor's obligation to identify conflicts for resolution by the Architect identified elsewhere in this Article it is intended that the more stringent, higher quality, and greater quantity of Work shall apply.
- F. Conformance With Laws:

1. Each and every provision of law required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon application of either party the Contract shall be amended in writing to make such insertion or correction.
2. Before commencing any portion of the Work, Contractor shall check and review the Contract Documents for such portion for conformance and compliance with all laws, ordinances, codes, rules and regulations of all governmental authorities and public utilities affecting the construction and operation of the physical plant of the Project, all quasi-governmental and other regulations affecting the construction and operation of the physical plant of the Project, and other special requirements, if any, designated in the Contract Documents.
3. In the event Contractor observes any violation of any law, ordinance, code, rule or regulation, or inconsistency with any such restrictions or special requirements of the Contract Documents, Contractor shall immediately notify Architect in writing of same and shall cause to be corrected any such violation or inconsistency in the manner provided hereunder.

G. Ambiguity:

1. Before commencing any portion of the Work, carefully examine all Drawings and Specifications and other information as to materials and methods of construction and other Project requirements.
2. Immediately notify Owner and Architect of any perceived or alleged error, inconsistency, ambiguity, or lack of detail or explanation in the Drawings and Specifications in the manner provided herein.
3. If the Contractor or its Subcontractors, material or equipment suppliers, or any of their officers, agents, and employees performs, permits, or causes the performance of any Work under the Contract Documents, which it knows or should have known to be in error, inconsistent, or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all costs arising, including, without limitation, the cost of correction without increase or adjustment to the Contract Price or the time for performance.
4. If Contractor performs, permits, or causes the performance of any Work under the Contract Documents prepared by or on behalf of Contractor which is in error, inconsistent or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all resulting costs, including, without limitation, the cost of correction, without increase to or adjustment in the Contract Price or the time for performance.
5. In no case shall any Subcontractor proceed with the Work if uncertain without the Contractor's written direction and/or approval.

1.12 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

5. Titles: The Specifications are separated into titled sections for convenience only and not to dictate or determine the trade or craft involved.
 6. As Shown, Etc. Where "as shown," "as indicated," "as detailed," or words of similar import are used, reference is made to the Drawings accompanying the Specifications unless otherwise stated. Where "as directed," "as required," "as permitted," "as authorized," "as accepted," "as selected," or words of similar import are used, the direction, requirement, permission, authorization, approval, acceptance, or selection by Architect is intended unless otherwise stated.
 7. Provide. "Provide" means "provided complete in place," that is, furnished, installed, tested, and ready for operation and use.
 8. General Conditions. The General Conditions and supplementary general conditions are a part of each and every section of the Specifications.
 9. Abbreviations:
 - a. In the interest of brevity, the Specifications are generally written in an abbreviated form in the imperative tense and may not include complete sentences.
 - b. Omission of words or phrases such as "Contractor shall," "shall be," etc., are intentional. Nevertheless, the requirements of the Specifications are mandatory and directed to the Contractor.
 - c. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.
 10. Plural words in the singular shall include the plural whenever applicable or the context so indicates.
 11. Metric: The Documents may indicate metric units of measurement as a supplement to U.S. customary units. When indicated thus: 1 inch (25 mm), the U. S. customary unit is specific, and the metric unit is nonspecific. When not shown with parentheses, the unit is specific. The metric units correspond to the "International System of Units" (SI) and generally follow ASTM E 80, "Standard for Metric Practice."
 12. Reference Standard Specifications: All references to standard specifications of a society, institute, association, or governmental authority is a reference to the organization's reference standard specifications, which are in effect at the date of the Contractor's proposal, or effective date as required by governing codes.
 - a. If applicable specifications are revised prior to completion of any part of the Work, the Contractor may, if acceptable to Architect, perform such Work in accordance with the revised specifications.
 - b. The standard specifications, except as modified in the Specifications for the Project, shall have full force and effect as though printed in the Specifications. Architect will furnish, upon request, information as to how copies of the standard specifications referred to may be obtained.
 - c. Procurement of reference standards and standard specifications is the sole responsibility of the Contractor.
 13. Absence of Modifiers: In the interest of brevity, the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another shall not affect the interpretation of either statement.
- B. Rules of Document Interpretation
1. In the event of conflict or ambiguity within the drawings, the following rules shall apply:
 - a. General Notes, when identified as such, shall be incorporated into other portions of Drawings.
 - b. Schedules, when identified as such, are complementary with other notes and other portions of Drawings including those identified as General Notes.

- c. Larger scale drawings shall take precedence over smaller scale drawings.
 - d. General or Typical Details and Symbols apply at all locations where specifically noted; at all locations conforming to the title of the Detail; at all locations of similar or identical graphic indication; at all locations where similar conditions are not fully or specifically shown or identified and complement similar details of specific conditions.
 - e. Details and Notes apply at all locations of similar or identical graphic indications and at all locations where similar conditions are not fully or specifically shown or identified.
 - f. Limitation of Indication does not affect Extent of Application: Indications of notes, details, and symbols may be limited to promote clarity. No limitation of application is intended nor shall be construed unless specifically noted.
2. Figured, derived, or numerical dimensions shall govern. At no time shall the Contractor base construction on scaled drawings.
 3. Specifications shall govern as to materials, workmanship, and installation procedures.
 4. In the case of disagreement or conflict between or within standards, specifications, and drawings, the more stringent, higher quality, and greater quantity of Work shall apply.
- C. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- D. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- E. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.
 4. The Drawings, General provisions of the Contract, including General and Supplementary Conditions and other Division 01 specifications apply to the Work of all specifications sections as if specifically reproduced therein.

1.13 EXISTING CONDITIONS

- A. Intent of the Drawings is to show existing conditions with information developed from field surveys and Owner's records, and to generally show the extent and type of work required to prepare the existing areas for new work. The information shown on the Drawings is not a guarantee of existing conditions.

1.14 CONTRACT COMPLETION

- A. Date of Completion and Beneficial Occupancy is defined as the Date of Completion of all punch list items, including, but not limited to the following:
1. Confirmation of mechanical and electrical systems testing and balancing, control sequences and operations.
 2. Completion of final cleaning, paint touch-up and adjusting.
 3. Adjustment and Contractor's certification of the finish hardware operation.
 4. Removal of Contractor's temporary facilities and materials.
 5. Owner's acceptance of the Work.

6. Certificate of Occupancy issued by the Authority Having Jurisdiction.

B. Owner's occupancy prior to completion of any or all of the above items, or other such missing or incomplete work as may occur, shall not be construed as acceptance of the Work or as Completion

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 10 00

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SECTION 01 21 00 - ALLOWANCES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Quantity allowances.
 - 4. Contingency allowances.
 - 5. Testing and inspecting allowances.

1.3 DEFINITIONS

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.5 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 UNIT-COST ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.9 QUANTITY ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.10 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.11 TESTING AND INSPECTING ALLOWANCES

- A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.
- B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.
- C. Costs of testing and inspection services not specifically required by the Contract Documents are Contractor responsibilities and are not included in the allowance.
- D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.12 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
 - 3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Quantity Allowance: Include 2000 cu. yd. (1529 cu. m) of unsatisfactory soil excavation and disposal off-site and replacement with satisfactory soil material from off-site, as specified in Section 31 20 00 "Earth Moving."
 - 1. Coordinate quantity allowance adjustment with unit-price requirements in Section 01 22 00 "Unit Prices."
- B. Allowance No. 2: Contingency Allowance: Include a contingency allowance of \$100,000.00 for use according to Owner's written instructions.
- C. Allowance No.3: Testing and Inspection Allowance: Include the sum of \$1,000.00 for testing concrete to be provided by Owner, as specified in Section 03 30 00 "Cast-in-Place Concrete."
- D. Allowance No. 4 for Signage: Lump Sum Allowance: Include \$20,000 bid allowance for signage package to be provided under deferred submittal. Signage to include all code required signage, maximum occupant load, room labeling, egress and emergency exiting signage. All signage to be manufactured and installed in compliance with ADA and CA building code."

END OF SECTION 01 21 00

SECTION 01 22 00 – UNIT PRICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the Part 3 "Schedule of Unit Prices" Article contain requirements for materials described under each unit price.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price No. 1: Removal of unsatisfactory soil and replacement with satisfactory soil material.
 - 1. Description: Unsatisfactory soil excavation and disposal off-site and replacement with satisfactory fill material or engineered fill from off-site, as required, in accordance with Section 31 20 00 "Earth Moving."
 - 2. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 21 00 "Allowances."
- B. Unit Price No. 2: Miscellaneous and structural steel.

1. Description: Miscellaneous lintels and other supports not otherwise indicated in the Contract Documents, in accordance with Section 05 12 00 "Structural Steel Framing" and Section 05 50 00 "Metal Fabrications."

END OF SECTION 01 22 00

SECTION 01 23 00 - ALTERNATES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. Price assigned to each alternate should be fully burdened with GC markups, not only the direct value of the line item in the SOV.
3. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other Work of the Contract.
- D. Schedule: A schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate 1: Additional Foundation Drainage and Waterproofing

1. Base Bid includes footing drainage system on the north and west sides of the main building and trash enclosure. Bid Alternate 1 includes two line items, please identify cost impacts separately:
 - a. Provide exterior footing drains, drainage mate, gravel backfill and liquid applied damp proofing on south and east sides of main building. Refer to sheet A2.7.
 - b. Provide sub slab drainage at the main building as shown on sheet per A2.7.

B. Alternate 2: Scope of Compressed Straw Panels (CSP)

1. Base Bid includes CSP at the interior face of exterior walls and at both sides of Wall Type 2, 1-hour rated acoustic partitions. Bid Alternate 2 includes three line items, please identify cost impacts separately:
 - a. Provide deductive alternate credit for removing CSP from the interior face of exterior walls.
 - b. Provide deductive alternate credit for removing CSP from one side of Wall Type 2.
 - c. Provide deductive alternate credit for removing CSP from both sides of Wall Type 2.

C. Alternate 3: Soffit Assembly

1. Base Bid includes stucco soffit with faux beams as indicated throughout the drawing set. Alternate 3 includes two line items, please identify cost impacts separately:
 - a. Replace stucco soffit with painted 3/8" Wood-Grain Fiber Cement Board (Hardi-Panel or equal). Provide 1/8" x 1/8" routed grooves at 8" o.c. parallel to fascia to mimic car decking.
 - b. Provide deductive alternative credit to remove faux beams.

D. Alternate 4: Storage Container

1. Base Bid includes storage container with associated paving, foundation, site work, sprinklers, and power as indicated on drawings. Alternate 4 includes two line items, please identify cost impacts separately:
 - a. Stub-out water and power at west side of the storage container location. Provide paving and footings for storage container as indicated on drawings, but remove the storage container itself from bid and consider it "provided by owner at a future date."
 - b. Remove storage container and associated power and water, paving and foundations from bid and replace it with mulch, see sheet A1.14 for limits.

E. Alternate 5: Landscape Deductions:

1. Base Bid includes landscape as shown on drawings. Alternate 5 includes 2 line items, please identify cost impacts separately:
 - a. Provide deductive alternate to remove all CMU block raised planters. Planted areas to remain at grade.
 - b. 2. Provide alternate pricing for (2) Courtyard Paver alternatives:
 - 1) Architectural Concrete. Match concrete including color and finish of exterior arcade. See architectural drawings.

- 2) Stabilized Decomposed Granite. Color: California Gold (Manufacturer: Organic Lock or equal to meet ADA compliance, California vendor: Gail Building Materials: <https://www.organic-lock.com/> <https://gailmaterials.net/product/organic-lock/>

END OF SECTION 01 23 00

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SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form provided in Project Manual or acceptable to Architect.
 - a. Submit Substitution Request – Form "A" for requests during bidding period.
 - b. Submit Substitution Request – Form "B" for requests after execution of contract.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
 - n. Written certification by the proposer that the Substitution is equal or better in every respect to that required by the contract Documents and that substitution will perform adequately in the application intended.
 - o. Written certification that the proposer will pay for all permits, fees, and costs required to implement the substitution, and including waiver of all claims for additional costs or time extension which may subsequently become apparent, and reimbursement of Owner and Architect for review or redesign services associated with re-approval by authorities.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions of Consideration: Architect will consider requests for substitution for cause only when one or more of the following conditions are met and documented:
 - a. Specified item fails to comply with regulatory requirement.
 - b. Specified item is no longer manufactured.
 - c. Specified item, through no fault of the Contractor, unavailable in the time frame required to meet project schedule.
 - d. Specified item, through subsequent information disclosure, will not perform properly or fit in designated space.
 - e. Manufacturer declares specified product to be unsuitable for use intended or refuses to warrant installation of product,
 - f. Substitution would be, in the sole judgment of the Architect, a substantial benefit to the Owner in terms of cost, time, energy conservation, or other consideration of merit.
 2. Conditions of Review: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution provides sustainable design characteristics that specified product provided for achieving required prerequisites and credits.
 - c. Substitution request is fully documented and properly submitted.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 35 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions of Review: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.

- c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- d. Requested substitution provides sustainable design characteristics that specified product provided for achieving required prerequisites and credits.
- e. Substitution request is fully documented and properly submitted.
- f. Requested substitution will not adversely affect Contractor's construction schedule.
- g. Requested substitution has received necessary approvals of authorities having jurisdiction.
- h. Requested substitution is compatible with other portions of the Work.
- i. Requested substitution has been coordinated with other portions of the Work.
- j. Requested substitution provides specified warranty.
- k. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 LIMITATIONS ON SUBSTITUTIONS SUBMITTED PRIOR TO THE RECEIPT OF BIDS

- A. Architect will consider requests for substitutions of specified equipment and/or materials only when requests are received by Architect within fourteen (14) days prior to the date established for the receipt of bids.
- B. Architect will consider a substitution request only if request is made in strict conformance with provisions of this Section. Request shall be fully responsive to all product requirements of the specified product, including those requirements noted in this section in the article titled PRODUCTS.
- C. Burden of proof of merit of requested substitution is the responsibility of the proposer requesting the substitution.
- D. It is the sole responsibility of the proposer requesting the substitution to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.
- E. When substitution is not accepted, provide specified product.
- F. Substitute products shall not be included within the bid without written acceptance by Addendum.
- G. No material changes permitted after the bid opening date. All alternate manufacturers and/or materials shall be submitted and approved in writing by the Architect prior to bid due date, except as otherwise provided in this section. Failure to comply with this requirement is grounds for disqualification of substitution.
- H. Architect will consider requests for substitutions of specified equipment and/or materials only when requests are received by Architect within fourteen (14) days prior to the date established for the receipt of bids, in conformance with Public Contract Code Section 3400. Do not request substitutions for products designated in the Notice Inviting Bids as "District Standards".
- I. The Bid shall be based upon the standards of quality established by those items of equipment and/or materials which are indicated in the Contract Documents, including those products designated in the Notice Inviting Bids as "District Standards".

3.2 LIMITATIONS ON SUBSTITUTIONS SUBMITTED AFTER THE AWARD OF THE CONTRACT

- A. The Contract is based upon the standards of quality established by those items of equipment and/or materials which are indicated in the Contract Documents, including those products designated in the Notice Inviting Bids as "District Standards".
- B. Notwithstanding other provisions of this section and the above, the Architect may consider a request for substitution after the date of the receipt of bids or contract award, if in the sole discretion of the Architect, there appears to be just cause for such a request. The acceptance of such a late request does not waive any other specified requirement.
- C. Architect will consider a request for substitution only if request is made in strict conformance with provisions of this section. Request shall be fully responsive to all product requirements of the specified product, including those requirements noted in related section 01 6000.
- D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- E. Review of submittals does not constitute acceptance of substitutions indicated or implied on submittals.
- F. Substitutions will not be considered when requested or submitted directly by subcontractor or supplier.
- G. Contractor's failure or inability to pursue the work promptly or coordinate activities properly shall not establish a cause for consideration of Substitutions.
- H. Burden of proof of merit of requested substitution is the responsibility of the Contractor.
- I. It is the sole responsibility of the Contractor to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.
- J. When substitution is not accepted, provide specified product.
- K. Substitute products shall not be provided without written acceptance by Change Order.

3.3 SUBSTITUTION PROCEDURES

- A. Instructions to Bidders and General Conditions of the Contract may specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements in related documents and procedures specified in this section.
- B. Do not request substitutions after expiration of specified periods.
- C. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
- D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
 - 1. All Performance Requirements listed in Articles titled QUALITY ASSURANCE, DESIGN CRITERIA, PERFORMANCE REQUIREMENTS and WARRANTY must be met and provided with the Request For Substitution.
 - 2. All Salient Physical Attributes must be met and documented with the Request For Substitution.
 - 3. Document each request on Architect's Request For Substitution (RFS) form with complete data substantiating compliance of proposed substitution with Contract Documents. All

requests for substitution must be submitted on the specified form which may be obtained from the Architect. Requests received without the Request Form will be rejected.

- E. A request for substitution constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives all claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- F. Regulatory Requirements: Proposer requesting the substitution shall be responsible for obtaining all regulatory approvals required for proposed substitutions.
- G. All regulatory approval shall be obtained for proposed substitutions prior to submittal of substitution request to Architect.
- H. All costs incurred by the Owner in obtaining regulatory approvals for proposed substitutions, including the costs of the Architect and any authority having jurisdiction over the project shall be reimbursed to the Owner. Costs of these services shall be reimbursed regardless of final acceptance or rejection of substitution.
- I. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

3.4 ARCHITECT'S REVIEW OF SUBSTITUTIONS

- A. The Architect will accept or reject proposed substitutions within fourteen (14) days of receipt of request.
- B. If a decision on a substitution cannot be made within the time allocated, the specified product shall be used.
- C. No extension of bid period or contract time will be made for substitution review.
- D. Final acceptance of a substitution submitted prior to the date established for the receipt of bids will be in the form of an Addendum.
- E. Final acceptance of a substitution submitted after the award of the contract will be in the form of a Change Order.
- F. Architect/Engineer shall be the judge of the acceptability of the proposed substitution. Architect's decision on substitution requests is final and does not require documentation or justification.
- G. Rejection Of Substitution Request: Any of the following reasons shall be cause for rejection, all as determined by the Architect;
 - 1. Vagueness or incompleteness of Substitution submittal,
 - 2. Insufficient data, failure to meet specified requirements, (including warranty).
 - 3. Qualification of the requirements of the Substitution Form, including modification of any of the requirements.

- H. The Architect/Engineer will notify Contractor in writing of decision to accept, accept as noted, or not accept the request for substitution.
- I. Substitute products shall not be ordered or installed without written acceptance.
- J. Owner shall receive full benefit of any cost reduction as a result of any request for substitution.
- K. Provide submittals for accepted substitutions in accordance with specified requirements of the respective section and provisions of Section 01 3300.
- L. An accepted substitution is not acceptable as a submittal. Provide separate submittals for each review.

END OF SECTION 01 25 00

EXHIBIT A
SUBSTITUTION REQUEST – FORM “A”
- For use during BIDDING period -

Project Name: OJAI PERMANENT SUPPORTIVE HOUSING		DJA Job No.: 2407	
		Date:	
To: Architect: DJA Architects, PLLC		Contractor:	
Specified Item:			
Specification Section	Paragraph No.	Drawing No.	Detail No.
Contractors Proposed Substitution:			
Reason for Request: _____ _____			
Manufacturer: _____			
Manufacturer Contract: _____			
Trade Name and Model: _____			
History: <input type="checkbox"/> New Product <input type="checkbox"/> 1-4 Years in market <input type="checkbox"/> 5-10 years in Market <input type="checkbox"/> Over 11 years in market			

Mandatory for Consideration: Specification Section 01 25 00 – Substitution Procedures

Drawings Product Data Samples Test Data Reports Other _____

Attach a **Point by Point Comparison** between proposed product and product indicated. Provide complete data for proposed product, including product/material descriptions, specifications, drawings, photographs, performance, MSDS data sheet and test data adequate for evaluation of the request. Clearly annotate applicable portions of the data. Include ICC Evaluation Service (ICC ES) Evaluation Report, if applicable.

SUBSTITUTION REQUEST – FORM “A”

- For use during BIDDING period -

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equivalent or superior in all respects to specified product.
- Proposed substitution complies with applicable Codes, ordinances and standards.
- Proposed substitution complies with Contract requirements.
- Same warranty will be furnished for proposed substitution as specified products.
- Same maintenance service and source of replacement parts, as applicable, are available.
- 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 substitution.

Submitted by: (name) _____ Title: _____

Signed: _____ Date: _____

Architect's Recommended Action:

Specified Item:

- Approved.** Refer to Addendum # _____.
- Approved.** Refer to Addendum # _____.
- Rejected – Use specified product/material.**
- Rejected received too late - Use specified product/material.**

Name: _____ Date: _____

Remarks: _____

SUBSTITUTION REQUEST – FORM “B”

- For use AFTER execution of Contract-

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equivalent or superior in all respects to specified product.
- Proposed substitution complies with applicable Codes, ordinances and standards.
- Proposed substitution complies with Contract requirements.
- Same warranty will be furnished for proposed substitution as specified products.
- Same maintenance service and source of replacement parts, as applicable, are available.
- 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 substitution.

Submitted by: (name) _____ Title: _____

Signed: _____ Date: _____

Architect's Recommended Action:

Specified Item:

Approved. Refer to Change Order # _____.

Approved. Refer to Change Order # _____.

Rejected – Use specified product/material.

Name: _____ Date: _____

Remarks: _____

SECTION 01 26 00 -

CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on form provided by Architect or AIA Document G710 – Architect’s Supplemental Instructions.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. 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.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. 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.
 - e. Quotation Form: Use forms provided by Owner. Sample copies are included in Project Manual or forms acceptable to Architect.
- B. 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.
 - 1. 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.

2. 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.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. 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.
6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form provided by Owner. Sample copy is included in Project Manual or form acceptable to Architect.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 01 21 00 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 01 22 00 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701 – Change Order.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on form provided by Architect or AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. 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.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.8 WORK CHANGE DIRECTIVE

- A. Work Change Directive: Architect may issue a Work Change Directive on form provided by Architect or EJCDC Document C-940. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Work 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.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.9 REQUESTS FOR INFORMATION

- A. Contractor may request information from the Architect by submitting a Request for Information (RFI). The RFIs shall be sequentially numbered. The Architect shall respond in writing within 5 days.

- B. Architect's Action:

1. Instructions relating to changes in the Work will be issued by the Architect on a Bulletin Form. These instructions are as follows:
 - a. The Architect directs the Contractor to execute changes in the Work, or, the Architect requests a Contractor Proposal for changes in the Work.
2. The Architect will indicate in the Bulletin the type of action by the Contractor required by the Bulletin.
3. The changes in the Work addressed in the Bulletin will be described in modified drawings and specifications, or other type of documents, issued with the Bulletin.

- C. Contractor's Action:

1. Proceed with instructions given by the Architect immediately.
2. If the Contractor is directed to execute the changes required by the Architect but the Contractor considers that the changes will cause an adjustment to the Contract Sum or Contract Time, the Contractor shall proceed as follows:
 - a. Before proceeding with the changes to the Work, submit to the Architect, within 5 working days of the date of receipt of the Bulletin, a preliminary estimate of the cost necessary to execute the proposed changes.
 - b. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract time.
 - d. Do not proceed with the changes in the Work described in the Bulletin until the Architect and Owner issue written further instructions.
3. If the Contractor is directed to commence with the changed Work immediately, and the Contractor considers that the changes will cause an adjustment to the Contract Sum or the Contract time, the Contractor shall proceed as follows:
 - a. Proceed with the changes to the Work and maintain detailed records on a time and material basis for work required by the Bulletin.
 - b. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
4. If the Contractor is directed to present a proposal to the Architect, the Contractor shall proceed as specified above.

1.10 CLAIMS

- A. Submit claims for increased costs because of a change in Scope of Work or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead and profit, within 20 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Claims submitted later than 20 days will be

rejected.

1. The Change Order cost amount shall not include the Contractor's or subcontractor's indirect expenses except when it is clearly demonstrated that either the nature or Scope of Work required was changed from that which could have been foreseen from information in the Contract Documents.
2. No change in the Contractor's indirect expense is permitted for selection of higher or lower priced materials or systems of the same Scope of Work and nature as originally indicated.

1.11 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of the Architect, it is not practical to remove and replace the Work, the Architect will direct appropriate remedy or adjust payment.
- C. Authority of Architect to assess defects and identify payment adjustments, is final.
- D. Non-Payment For Rejected Products: Payment will not be made for rejected products for any of the following:
 1. Products wasted or disposed of in a manner that is not acceptable.
 2. Products determined as unacceptable before or after placement.
 3. Products not completely unloaded from transporting vehicle.
 4. Products placed beyond lines and levels of required Work.
 5. Products remaining on hand after completion of the Work.
 6. Loading, hauling, and disposing of rejected products.
 7. Loading, hauling, and disposing of rejected products.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 26 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Submit Schedule of Values on AIA Form G703 - Application and Certificate for Payment Continuation Sheet.
- B. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 - 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
 - 5. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract, as described in Section 01 10 00 "Summary."
- C. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Owner's name.
 - c. Owner's Project number.

- d. Name of Architect.
 - e. Architect's Project number.
 - f. Contractor's name and address.
 - g. Date of submittal.
2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - a. Include separate line items under Contractor and principal subcontracts for final project documentation, including sustainable initiatives as specified in related sections, and other Project closeout requirements in an amount totaling seven percent of the Contract Sum and subcontract amount.
 5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
 6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 8. Purchase Contracts: Provide a separate line item in the schedule of values for each Purchase contract. Show line-item value of Purchase contract. Indicate Owner payments or deposits, if any, and balance to be paid by Contractor.
 9. Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.
 10. Overhead Costs, Separate Line Items: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 11. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.

12. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
13. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is indicated in the Owner/Contractor Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect, as indicated in the Owner/Contractor Agreement, or by the 25th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
 1. Other Application for Payment forms proposed by the Contractor may be acceptable to Architect and Owner. Submit forms for approval with initial submittal of schedule of values.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.

- b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- I. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
 5. Products list (preliminary if not final).
 6. Sustainable design action plans, including preliminary project materials cost data.
 7. Schedule of unit prices.
 8. Submittal schedule (preliminary if not final).
 9. List of Contractor's staff assignments.
 10. List of Contractor's principal consultants.
 11. Copies of building permits.
 12. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 13. Initial progress report.
 14. Report of preconstruction conference.
 15. Certificates of insurance and insurance policies.
 16. Performance and payment bonds.
 17. Data needed to acquire Owner's insurance.

- J. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 - a. Complete administrative actions, submittals, and Work preceding this application, as described in Section 017700 "Closeout Procedures."
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- K. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Certification of completion of final punch list items.
 3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 4. Updated final statement, accounting for final changes to the Contract Sum.
 5. AIA Document G706 - Contractor's Affidavit of Payment of Debts and Claims.
 6. AIA Document G706A Contractor's Affidavit of Release of Liens.
 7. AIA Document G707- Consent of Surety to Final Payment.
 8. Evidence that claims have been settled.
 9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 10. Final liquidated damages settlement statement.
 11. Proof that taxes, fees, and similar obligations are paid.
 12. Waivers and releases.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 29 00

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SECTION 01 31 00 -

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.
 - 4. Section 01 91 13 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

- A. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.
 - 1. A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as RFI.
 - 2. A properly prepared request for information or interpretation shall include a detailed written statement that indicates the specific Drawing(s) or Specification(s) in need of clarification and the nature of the clarification requested.
 - a. Drawings shall be identified by Drawing number and location on the Drawing sheet.
 - b. Specifications shall be identified by Section number, page and paragraph.
 - c. Requests for Information: Request made by Contractor concerning information not indicated on Drawings nor contained in Project Manual that is required to properly perform the work.
 - d. Requests for Interpretation: Request made by Contractor in accordance with the Contract for construction as per AIA A-104-2017.

- B. Improper RFI's:
 - 1. RFI's that are not properly prepared.
 - 2. Improper RFI's will be rejected by Architect. The Contractor will be notified by the Architect upon rejection of improper RFI's.

- C. Frivolous RFI's:
 - 1. RFI's which request information that is clearly shown on the Contract Documents as determined by the Architect .
 - 2. Contractor is responsible to review all coordination questions and relay information within the documents to subcontractors, vendors, and/ or suppliers.
 - 3. The Contractor may be assessed a fee as decided by Architect for each frivolous RFI at closeout.

- D. Neither improper nor frivolous RFI's will be allowed as basis for Change Orders claiming additional costs and/or time extensions.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in Project meeting room, in temporary field office, and in prominent location in each built facility. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.

- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and direction of Project coordinator to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. General contractor is responsible to coordinate the addition of trade-specific information to coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
 - h. Prepare coordination drawings at full scale (life size) at locations requested by Architect, demonstrate conflict resolution in mockups and on in-situ construction.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.

2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
 9. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
 10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01 33 00 "Submittal Procedures."
- C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
1. File Preparation Format:
 - a. Same digital data software program, version, and operating system as original Drawings.
 2. File Submittal Format: Submit or post coordination drawing files using PDF format.
 3. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.

- a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
- b. Digital Data Software Program: Drawings are available in AutoCAD Format.
- c. Contractor shall execute a data licensing agreement in the form of Agreement included in this Project Manual or an Agreement form acceptable to Owner and Architect.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
 3. An RFI cannot modify the Contract Cost, Contract Time, or the Contract Documents.
 4. Submit RFIs to Architect on the form included in the project manual. Submittals not conforming to this requirement will be returned.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Owner name.
 3. Owner's Project number.
 4. Name of Architect.
 5. Architect's Project number.
 6. Date.
 7. Name of Contractor.
 8. RFI number, numbered sequentially.
 9. RFI subject.
 10. Specification Section number and title and related paragraphs, as appropriate.
 11. Drawing number and detail references, as appropriate.
 12. Field dimensions and conditions, as appropriate.
 13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 14. Contractor's signature.
 15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Form bound in Project Manual or Software-generated form with substantially the same content as indicated above, acceptable to Architect.
 1. Attachments shall be electronic files in PDF format.

- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow fourteen (14) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day. If the Architect cannot respond to the RFI within fourteen (14) calendar days, the Architect shall notify the Contractor and the Owner, of the estimated amount of time that will be required to respond.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures" Or Owner/Contractor Contract Documents.
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within Insert number 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly.
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect and Construction Manager.
 4. RFI number, including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.
- 1.8 ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS (ASI)
- A. An ASI is a written supplemental instruction issued and signed by the Architect for minor changes to the Work, without change in Contract Sum or Contract Time.
 - B. An ASI cannot modify the Contract Cost, Contract Time, or the Contract Documents.
 - C. Architect Authority:

1. The Architect has authority to order minor changes in the Work not involving any adjustment in the Contract Sum, an extension of the Contract Time, or a change which is inconsistent with the intent of the Contract Documents.
2. The Contractor shall carry out such written orders promptly.

1.9 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of seven days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Phasing.
 - d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Procedures for processing field decisions and Change Orders.
 - h. Procedures for RFIs.
 - i. Procedures for testing and inspecting.
 - j. Procedures for processing Applications for Payment.
 - k. Distribution of the Contract Documents.
 - l. Submittal procedures.
 - m. Sustainable design requirements.
 - n. Preparation of Record Documents.
 - o. Work restrictions.
 - p. Working hours.
 - q. Owner's occupancy requirements.
 - r. Responsibility for temporary facilities and controls.
 - s. Procedures for moisture and mold control.

- t. Procedures for disruptions and shutdowns.
 - u. Construction waste management and recycling.
 - v. Parking availability.
 - w. Office, work, and storage areas.
 - x. Equipment deliveries and priorities.
 - y. First aid.
 - z. Security.
 - aa. Progress cleaning.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- C. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Procedures for completing and archiving web-based Project software site data files.
 - d. Submittal of written warranties.
 - e. Requirements for completing sustainable design documentation.
 - f. Requirements for preparing operations and maintenance data.
 - g. Requirements for delivery of material samples, attic stock, and spare parts.
 - h. Requirements for demonstration and training.
 - i. Preparation of Contractor's punch list.
 - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - k. Submittal procedures.
 - l. Coordination of separate contracts.
 - m. Owner's partial occupancy requirements.
 - n. Installation of Owner's furniture, fixtures, and equipment.
 - o. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

D. Progress Meetings: Conduct progress meetings at regular intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Status of LEED sustainable design documentation.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site use.
 - 9) Temporary facilities and controls.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of Proposal Requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Pending claims and disputes.
 - 19) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site use.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of RFIs.
 - 14) Proposal Requests.
 - 15) Change Orders.
 - 16) Pending changes.
 3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 FORMS

- A. Attached to the end of this section are the following forms for the contractor use.
 - 1. Request for Information form (Exhibit A)

END OF SECTION 01 31 00

EXHIBIT A
REQUEST FOR INFORMATION

Project Name: OJAI PERMANENT SUPPORTIVE HOUSING		DJA Job No.: 2407	
		RFI No:	
To: Architect: DJA ARCHITECTS, PLLC		Contractor:	
Subject:			
Specification Section	Paragraph No.	Drawing No.	Detail No.
Category:			
<input type="checkbox"/> Need for Clarification. <input type="checkbox"/> Unforeseen Condition. <input type="checkbox"/> Conflict Within Documents.		<input type="checkbox"/> Coordination Problem. <input type="checkbox"/> Other.	
Description:			
Contractor's Proposed Resolution:			
<input type="checkbox"/> Attachments: <input type="checkbox"/> Estimated Cost Impact" \$			
		<input type="checkbox"/> Estimated Time Impact:	
Contractor Signature:		Date:	
Architect's Response:			
Refer to RFI procedures specified in Section 01 31 00 – Project Management and Coordination. This RFI, when completed is not authorization for change to the Contract Documents. Changes to the Contract Documents are authorized only by properly executed Construction Change Directives or Change Order.			
<input type="checkbox"/> Attachments:			
Architect's Signature:		Date:	

SECTION 01 32 00 –

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's Construction Schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.
7. Unusual event reports.

B. Related Requirements:

1. Section 01 29 00 "Payment Procedures" for schedule of values and requirements for use of cost-loaded schedule for Applications for Payment.
2. Section 01 40 00 "Quality Requirements" for schedule of tests and inspections.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of labor and equipment necessary for completing an activity as scheduled.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file.
2. PDF file.

B. Startup construction schedule.

1. Submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.

D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports to contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
3. Total Float Report: List of activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

E. Construction Schedule Updating Reports: Submit with Applications for Payment.

F. Daily Construction Reports: Submit at weekly intervals.

G. Material Location Reports: Submit at monthly intervals.

H. Site Condition Reports: Submit at time of discovery of differing conditions.

I. Unusual Event Reports: Submit at time of unusual event.

J. Qualification Data: For scheduling consultant.

1.4 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.
- B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.
 - 3. Discuss constraints, including phasing, work stages interim milestones and partial Owner occupancy.
 - 4. Review delivery dates for Owner-furnished products.
 - 5. Review schedule for work of Owner's separate contracts.
 - 6. Review submittal requirements and procedures.
 - 7. Review time required for review of submittals and resubmittals.
 - 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
 - 10. Review and finalize list of construction activities to be included in schedule.
 - 11. Review procedures for updating schedule.

1.5 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.6 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Computer Scheduling Software: Prepare schedules using current version of a program that is capable of managing construction schedules.
 - 1. Use Microsoft Project for current Windows operating system.
- B. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting, using CPM scheduling.
 - 1. In-House Option: Owner may waive requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 - 2. Meetings: Scheduling consultant to attend all meetings related to Project progress, alleged delays, and time impact.
- C. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.

1. Contract completion date to not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- D. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 2. Temporary Facilities: Indicate start and completion dates for the following as applicable:
 - a. Securing of approvals and permits required for performance of the Work.
 - b. Temporary facilities.
 - c. Construction of mock-ups, prototypes and samples.
 - d. Owner interfaces and furnishing of items.
 - e. Interfaces with Separate Contracts.
 - f. Regulatory agency approvals.
 - g. Punch list.
 3. Procurement Activities: Include procurement process activities for the following long lead-time items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 4. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 5. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 6. Commissioning Time: Include no fewer than 15 days for commissioning.
 7. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 8. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.
- E. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.

- c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use-of-premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
- a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Building flush-out.
 - m. Startup and placement into final use and operation.
 - n. Commissioning.
8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
- a. Structural completion.
 - b. Temporary enclosure and space conditioning.
 - c. Permanent space enclosure.
 - d. Completion of mechanical installation.
 - e. Completion of electrical installation.
 - f. Substantial Completion.
- F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- G. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
1. See Section 01 29 00 "Payment Procedures" for cost reporting and payment procedures.
- H. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and the Contract Time.
- I. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Final Completion percentage for each activity.
- J. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.
- K. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.
- 1.7 CPM SCHEDULE REQUIREMENTS
- A. Prepare network diagrams using AON (activity-on-node) format.
- B. Startup Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a time-scaled CPM network analysis diagram for the Work.
1. Develop network diagram in sufficient time to submit CPM schedule, so it can be accepted for use no later than 60 days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract must not excuse Contractor from completing all work within applicable completion dates.
 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and inspection.
 - j. Commissioning.
 - k. Punch list and Final Completion.
 - l. Activities occurring following Final Completion.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates to be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
 5. Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Architect's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents, sustainable design documentation, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.
 - a. Each activity cost to reflect an appropriate value subject to approval by Architect.
 - b. Total cost assigned to activities to equal the total Contract Sum.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.

2. Description of activity.
3. Main events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the schedule of values).

G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

H. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.

1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

1.8 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.

6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.
 8. Accidents.
 9. Meetings and significant decisions.
 10. Unusual events.
 11. Stoppages, delays, shortages, and losses.
 12. Meter readings and similar recordings.
 13. Emergency procedures.
 14. Orders and requests of authorities having jurisdiction.
 15. Change Orders received and implemented.
 16. Construction Change Directives received and implemented.
 17. Services connected and disconnected.
 18. Equipment or system tests and startups.
 19. Partial completions and occupancies.
 20. Substantial Completions authorized.
- B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List to be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.
1. Submit unusual event reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 32 00

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SECTION 01 32 33 -

PHOTOGRAPHIC DOCUMENTATION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Concealed Work photographs.
3. Periodic construction photographs.
4. Time-lapse sequence construction photographs.
5. Final Completion construction photographs.
6. Preconstruction video recordings.
7. Periodic construction video recordings.
8. Time-lapse sequence construction video recordings.

B. Related Requirements:

1. Section 01 77 00 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
2. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.
3. Section 31 10 00 "Site Clearing" for photographic documentation before site clearing operations commence.

1.2 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph and video recording. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit image files within three days of taking photographs.

1. Submit photos by uploading to web-based Project management software site. Include copy of key plan indicating each photograph's location and direction.
2. Identification: Provide the following information with each image description in web-based Project management software site:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of location, vantage point, and direction.
 - g. Unique sequential identifier keyed to accompanying key plan.

- C. Video Recordings: Submit video recordings within seven days of recording.
1. Submit video recordings on CD-ROM or thumb drive or by uploading to web-based Project management software site. Include copy of key plan indicating each video's location and direction.
 2. Identification: With each submittal, provide the following information on web-based Project management software site:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date video recording was recorded.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 3. Transcript: Prepared on 8-1/2-by-11-inch (215-by-280-mm) paper, punched and bound in three-ring binders. Provide label on front and spine. Include a cover sheet with label information. Include name of Project and date of video recording on each page.
- D. Time-Lapse Video: Submit time-lapse sequence video recordings within 2 days of recording.
1. Submit time-lapse sequence video recordings monthly by uploading to web-based Project management software site.
 2. Identification: For each recording, provide the following information on web-based Project management software site:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date(s) and time(s) video recording was recorded.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

1.3 QUALITY ASSURANCE

- A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.
- B. Construction Webcam Service Provider: A firm specializing in providing photographic equipment, web-based software, and related services for construction projects, with a record of providing satisfactory services similar to those required for Project.

1.4 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels. Use flash in low light levels or backlit conditions.
- B. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full high-definition mode. Provide supplemental lighting in low light levels or backlit conditions.

- C. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
- D. Metadata: Record accurate date and time and GPS location data from camera.
- E. File Names: Name media files with date, Project area and sequential numbering suffix.

1.5 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.
- B. General: Take photographs with maximum depth of field and in focus.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Preconstruction Photographs: Before commencement of the Work, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
 - 1. Flag excavation areas before taking construction photographs.
 - 2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take 20 photographs of existing buildings either on or adjoining property, to accurately record physical conditions at start of construction.
 - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- D. Concealed Work Photographs: Before proceeding with installing work that will conceal other work, take photographs sufficient in number, with annotated descriptions, to record nature and location of concealed Work, including, but not limited to, the following:
 - 1. Underground utilities.
 - 2. Underslab services.
 - 3. Piping.
 - 4. Electrical conduit.
 - 5. Waterproofing and weather-resistant barriers.
- E. Periodic Construction Photographs: Take 20 photographs weekly. Select vantage points to show status of construction and progress since last photographs were taken.
- F. Time-Lapse Sequence Construction Photographs: Take 20 photographs as indicated, to show status of construction and progress since last photographs were taken.
 - 1. Frequency: Take photographs monthly, on the same date each month.
 - 2. Vantage Points: Following suggestions by Architect and Contractor, photographer to select vantage points. During each of the following construction phases, take not less than two of the required shots from same vantage point each time, to create a time-lapse sequence as follows:
 - a. Commencement of the Work, through completion of subgrade construction.
 - b. Above-grade structural framing.
 - c. Exterior building enclosure.
 - d. Interior Work, through date of Substantial Completion.

- G. Final Completion Construction Photographs: Take 100 photographs after date of Substantial Completion for submission as Project Record Documents. Architect will inform photographer of desired vantage points.
- H. Additional Photographs: Architect may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum or in the allowance for construction photographs.
 - 1. Three days' notice will be given, where feasible.
 - 2. In emergency situations, take additional photographs within 24 hours of request.
 - 3. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Special events planned at Project site.
 - b. Immediate follow-up when on-site events result in construction damage or losses.
 - c. Photographs are to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
 - d. Substantial Completion of a major phase or component of the Work.
 - e. Extra record photographs at time of final acceptance.
 - f. Owner's request for special publicity photographs.

1.6 CONSTRUCTION VIDEO RECORDINGS

- A. Video Recording Photographer: Engage a qualified videographer to record construction video recordings.
- B. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed, recent events, and planned activities. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.
 - 1. Confirm date and time at beginning and end of recording.
 - 2. Begin each video recording with name of Project, Contractor's name, videographer's name, and Project location.
- C. Transcript: Provide a typewritten transcript of the narration. Display images and running time captured from video recording opposite the corresponding narration segment.
- D. Preconstruction Video Recording: Before starting excavation, record video recording of Project site and surrounding properties from different vantage points, as directed by Architect.
 - 1. Flag excavation areas before recording construction video recordings.
 - 2. Show existing conditions adjacent to Project site before starting the Work.
 - 3. Show existing buildings either on or adjoining Project site to accurately record physical conditions at the start of excavation.
 - 4. Show protection efforts by Contractor.
- E. Periodic Construction Video Recordings: Record video recording monthly. Select vantage points to show status of construction and progress since last video recordings were recorded. Minimum recording time to be 30 minutes(s).
- F. Time-Lapse Sequence Construction Video Recordings: Record video recording to show status of construction and progress.

1. Frequency: During each of the following construction phases, set up video recorder to automatically record one frame of video recording every five minutes, from same vantage point each time, to create a time-lapse sequence of 30 minutes in length as follows:
 - a. Commencement of the Work, through completion of subgrade construction.
 - b. Above-grade structural framing.
 - c. Exterior building enclosure.
2. Timer: Provide timer to automatically start and stop video recorder, so recording occurs only during daylight hours.
3. Vantage Points: Following suggestions by Architect and Contractor, photographer to select vantage points.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 32 33

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SECTION 01 33 00 – SUBMITTAL PROCEDURES

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. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 01 31 00 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
3. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
4. Section 01 32 33 "Photographic Documentation" for submitting preconstruction photographs, periodic construction photographs, and Final Completion construction photographs.
5. Section 01 40 00 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
6. Section 01 77 00 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
7. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
8. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
9. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 WORK NOT INCLUDED

- A. Submittals which are not required will not be reviewed by the Architect.
- B. The Contractor may require subcontractors to provide drawings, setting diagrams or similar information as part of the coordination of the Work. The Architect will not review this data.
- C. Material Safety Data Sheets (MSDS) - Limitation of Review: Certain Submittals require provision of these documents by the Contractor. These documents contain information necessary for operation of the facility. The Architect's review of these submittals is limited to noting inclusion of the document for the Owner's use. No further review or comment on MSDS documents by Architect shall be performed or inferred.

1.4 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.5 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - 3. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
 - 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled dates for purchasing.
 - h. Scheduled date of fabrication.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.6 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
1. Project name.
 2. Date.
 3. Name of Architect.
 4. Name of Construction Manager.
 5. Name of Contractor.
 6. Name of firm or entity that prepared submittal.
 7. Names of subcontractor, manufacturer, and supplier.
 8. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
 9. Category and type of submittal.
 10. Submittal purpose and description.
 11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
 12. Drawing number and detail references, as appropriate.
 13. Indication of full or partial submittal.
 14. Location(s) where product is to be installed, as appropriate.
 15. Other necessary identification.
 16. Remarks.
 17. Signature of transmitter.
- B. Options: Identify options requiring selection by Architect.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- D. Paper Submittals:
1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
 4. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
 5. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 6. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using AIA Document G810 transmittal form.
- E. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

- F. Submittals Utilizing Web-Based Project Software: Prepare submittals as PDF files or other format indicated by Project management software.

1.7 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
 - a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
 - 2. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project management software website. Enter required data in web-based software site to fully identify submittal.
 - 3. Paper: Prepare submittals in paper form and deliver to Architect.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. 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 resubmittals.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 - 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
 - 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

- a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.8 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Architect's digital data drawing files is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

- a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
 - a. Two opaque (bond) copies of each submittal. Architect will return one copy(ies).
 - b. Three opaque copies of each submittal. Architect will retain two copies; remainder will be returned.
- C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.
 4. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
 5. Paper Transmittal: Include paper transmittal, including complete submittal information indicated.
 6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 7. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.

- a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
8. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
- a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.

5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.9 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.10 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.11 ARCHITECT'S REVIEW

- A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return.
 1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action.
 2. Paper Submittals: Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
 3. Submittals by Web-Based Project Management Software: Architect will indicate, on Project management software website, the appropriate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Architect will return without review submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Architect without action.

1.12 ARCHITECT'S AND CONSTRUCTION MANAGER'S REVIEW

- A. Action Submittals: Architect and Construction Manager will review each submittal, indicate corrections or revisions required, and return.
 1. PDF Submittals: Architect and Construction Manager will indicate, via markup on each submittal, the appropriate action.
 2. Paper Submittals: Architect and Construction Manager will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
 3. Submittals by Web-Based Project Management Software: Architect and Construction Manager will indicate, on Project management software website, the appropriate action.

- B. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect and Construction Manager.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Architect and Construction Manager will return without review submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 33 00

SECTION 01 33 16 -

DEFERRED APPROVAL SUBMITTAL PROCEDURES

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: General requirements for the submittal of plans, details, and calculations for engineered products and systems designated as deferred submittal and/or delegated design / design-build components on the Drawings, and as listed within this Section.

- 1. To ensure that the specified products are furnished and installed in accordance with the design intent, these procedures have been established for advance submittal of design data, and for review and acceptance or rejection by the Architect.

- B. Contractor is responsible to obtain all regulatory approvals, including obtaining required permits and inspections at no additional cost to the Owner.

1.3 DEFERRED APPROVAL PRODUCTS & SYSTEMS

- A. Provide Deferred Approval submittals for review for the following items:

- 1. Fire Sprinklers and Alarms
- 2. Design build signage package
- 3. Design build storage container
- 4. Design build PV Solar array
- 5. Design build decorative steel gates
- 6. Miscellaneous building components.

1.4 SUBMITTAL PROCEDURES

- A. The number of copies of each type of submittal and distribution procedures shall be determined at the pre-construction conference.

- 1. Allow sufficient copies for Owner, General Contractor, Architect and Architect's consultants, and agency having jurisdiction (AHJ), as applicable.
- 2. Determine which submittals shall be provided on reproducible material.

- B. Make submittals sufficiently in advance of scheduled dates of installation to provide adequate time for securing necessary approvals, for revision and resubmittal, and for placing orders and securing delivery.

- C. Submit special detailed drawings, schedules, or other data prepared by qualified detailers. Identify details by reference to the Drawing sheet and detail numbers and by Specification Section and article numbers.

- D. Deferred Approval submittals shall meet the requirements for any permit submittals that may be required for construction and shall include not less than the following:

1. Dimensioned plans, elevations, and sections locating assembly components in relationship to each other and in relationship to contiguous building structure or site elements.
 2. Typical and special fabrication and installation details.
 3. Design criteria, drawings and calculations.
 4. Materials and finishes.
- E. Schedule: Submit all Deferred Approval submittals within 60 days after Award of Contract.
- F. Do Not Begin Work requiring submittals until the submittals have been returned with the AHJ and Architect's stamp indicating review and acceptance.
- 1.5 QUALITY ASSURANCE
- A. Contractor shall be responsible for the design, engineering, fabrication, and installation of design-build items within the physical limitations and design parameters indicated in the Drawings.
1. Submittals of drawings and calculations for structural items shall be wet stamped and signed by a professional Structural Engineer licensed to practice in the state of the Project location.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 APPROVAL PROCEDURES

- A. Preliminary Submittal: Submit design data, latest printed product literature, color schedules, samples, and other data to Architect per Section 01 33 00 "Submittal Procedures" illustrating intent to meet design and performance requirements.
- B. Agency Submittal: Upon acceptance of item by Architect, submit complete calculations and other data to AHJs for review and approval with transmittal copy to Owner and Architect.
- C. Final Submittal: Upon receipt of approval by AHJs, obtain all required permits and submit to Owner.

3.2 DEFERRED SUBMITTAL SCOPE

- A. Fire sprinklers and alarms - general contractor to provide design-build fire sprinkler and alarm system under deferred submittal, main building, storage container and trash enclosure to be fully sprinklered per nfpa 13. Fire alarm system with smoke and carbon monoxide detectors to be provided per nfpa 72. Provide ada notification systems (strobe and audible) at all sleeping units.
- B. Design-build signage package-gc to provide design-build signage package under deferred submittal, signage package to include all code required signage, maximum occupant load, room labeling, egress and emergency exiting signage. All signage to be manufactured and installed in accordance with ada requirements.
- C. Design-build storage container. 8' x 40' "one-trip" conex storage container, custom modified to include lighting package, two 3'-0" x 7'-0" doors with egress hardware, footings and anchorage, and limited area sprinkler system per nfpa 13. See a1.0 for location and configuration information.
- D. Design-build pv solar array, general contractor to provide conduits and rough-in between mechanical room and roof, pv panels, inverters and system to provided by owner under separate contract.
- E. Design-build decorative steel gates. (3) gates at main building, (1) gate at trash enclosure. See a2.9 door schedule for design criteria and hardware requirements.

- F. General contractor to provide misc. fasteners, adhesives, sealants, flashings, coatings and other typical building components required for a high-quality, structurally sound and weather-tight building.

END OF SECTION 01 33 16

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SECTION 01 40 00 - QUALITY REQUIREMENTS

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 administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.
- C. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for testing and inspection allowances.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- D. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

- E. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
 - F. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.
 - 1. Mockups are used for one or more of the following:
 - a. Verify selections made under Sample submittals.
 - b. Demonstrate aesthetic effects.
 - c. Demonstrate the qualities of products and workmanship.
 - d. Demonstrate successful installation of interfaces between components and systems.
 - e. Perform preconstruction testing to determine system performance.
 - 2. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
 - 3. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 - 4. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
 - G. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
 - H. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) in accordance with 29 CFR 1910.7, by a testing agency accredited in accordance with NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
 - I. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
 - J. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."
- 1.4 DELEGATED DESIGN SERVICES
- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
 - B. Delegated Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.5 CONFLICTING REQUIREMENTS

- A. **Conflicting Standards and Other Requirements:** If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.
- B. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

- A. **Mockup Shop Drawings:**
 - 1. Include plans, sections, elevations, and details, indicating materials and size of mockup construction.
 - 2. Indicate manufacturer and model number of individual components.
 - 3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.7 INFORMATIONAL SUBMITTALS

- A. **Contractor's Quality-Control Plan:** For quality-assurance and quality-control activities and responsibilities.
- B. **Qualification Data:** For Contractor's quality-control personnel.
- C. **Contractor's Statement of Responsibility:** When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
 - 2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- D. **Testing Agency Qualifications:** For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. **Schedule of Tests and Inspections:** Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

- F. Reports: Prepare and submit certified written reports and documents as specified.
- G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
 - 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, telephone number, and email address of testing agency.
 - 4. Dates and locations of samples and tests or inspections.

5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement of whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.10 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.
 - 1. Requirements of authorities having jurisdiction supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor's Responsibilities:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups, using installers who will perform same tasks for Project.
 - e. When testing is complete, remove test specimens and test assemblies, and mockups; do not reuse products on Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and Commissioning Authority, with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.

- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups of size indicated.
 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
 3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 6. Obtain Architect's approval of mockups before starting corresponding Work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
 8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 10. Demolish and remove mockups when directed unless otherwise indicated.

1.11 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 2. Payment for these services will be made from testing and inspection allowances specified in Section 01 21 00 "Allowances," as authorized by Change Orders.
 3. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.

4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspection equipment at Project site.

- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.
 - 1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
 - 2. Distribution: Distribute schedule to Owner, Architect, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.12 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in the Statement of Special Inspections attached to this Section, and as follows:
 - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures, and reviewing the completeness and adequacy of those procedures to perform the Work.
 - 2. Notifying Architect, Commissioning Authority, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 - 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect and Commissioning Authority with copy to Contractor and to authorities having jurisdiction.
 - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 - 5. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
 - 6. Retesting and reinspecting corrected Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 42 00

REFERENCES

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 DEFINITIONS

- A. General: Contract definitions are included in the Conditions of the Contract.
- B. Addenda: Written or graphic instruments issued prior to the opening of Bids, which clarify, correct or change the bidding requirements or the Contract Documents. Addenda shall not include the minutes of the Pre-bid Conference and Site Visit.
- C. Additive Bid: The sum to be added to the Base Bid if the change in scope of work as described in Additive Bid is accepted by Owner.
- D. Agreement: Agreement is the basic contract document that binds the parties to construction Work. Agreement defines relationships and obligations between Owner and Contractor and by reference incorporates Conditions of Contract, Drawings, and Specifications and contains Addenda and all Modifications subsequent to execution of Contract.
- E. Alternate: Work added to or deducted from the Base Bid, if accepted by Owner.
- F. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract. In no case will "approval" by Architect/Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of contract documents.
- G. Approved Equal: Approved in writing by Owner as being of equivalent quality, utility and appearance.
- H. Architect or Architect/Engineer: The person holding a valid Architect's license, whose firm has been designated as the Architect to provide architectural services on the project.
- I. Bid: The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
- J. Bidder: One who submits a Bid.
- K. By Owner: Work that will be performed by Owner or its agents at the Owner's expense.
- L. By Others: Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by Owner, other contractors, or other means.
- M. Change Order: A written instrument prepared by Architect and signed by Architect, Owner and Contractor, stating their agreement upon all of the following:
 - 1. a change in the Work,
 - 2. the amount of the adjustment in the Contract Sum, if any, and
 - 3. the amount of the adjustment in the Contract Time, if any.

- N. Concealed: Work not exposed to view in the finished Work, including within or behind various construction elements.
- O. Contract Conditions: Conditions of Contract define basic rights, responsibilities and relationships of Contractor and Owner and consists of two parts: General Conditions and Supplementary Conditions.
 - 1. General Conditions are general clauses, which are common to the Owner Contracts.
 - 2. Supplementary conditions modify or supplement General Conditions to meet specific requirements for this Contract.
- P. Contract Documents: Contract Documents shall consist of the documents identified as the Contract Documents in Contract Agreement, plus all changes, addenda and modifications thereto.
- Q. Contract Modification: Either:
 - 1. a written amendment to Contract signed by Contractor and Owner; or
 - 2. a Change Order; or
 - 3. a written directive for a minor change in the Work issued by Architect.
- R. Contract Sum: The sum stated in the Agreement and, including authorized adjustments, the total amount payable by Owner to Contractor for performance of the Work and the Contract Documents. (Also referred to as the Contract Price.)
- S. Contract Times: The number or numbers of days or the dates stated in the Agreement (i) to achieve substantial completion of the Work or designated milestones and/or (ii) to complete the Work so that it is ready for final payment and is accepted.
- T. Contractor: The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neuter in gender. The term "Contractor" means the Contractor or its authorized representative.
- U. Contractor's Employees: Persons engaged in execution of Work under Contract as direct employees of Contractor, as subcontractors, or as employees of subcontractors.
- V. Date of Substantial Completion: Date of Substantial Completion of Work or designated portion thereof is date certified by Architect when construction is sufficiently complete in accordance with Contract Documents for Owner to occupy Work or designated portion thereof for its use for which it is intended.
- W. Day: One calendar day, unless the word "day" is specifically modified to the contrary.
- X. Deductive Bid: The sum to be subtracting to the Base Bid if the change in scope of work as described in Deductive Bid is accepted by Owner.
- Y. Defective: An adjective which, when modifying the word "Work", refers to Work that is unsatisfactory or unsuited for the use intended, faulty, or deficient, that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including but not limited to approval of samples and "or equal" items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by Owner). Architect is the judge of whether Work is defective.
- Z. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed." However, no such implied meaning will be interpreted to extend the Architect's/Engineer's responsibility into the Contractor's responsibility of construction supervision.
- AA. Drawings: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

- BB. Engineer: Where referenced in General Conditions, the person holding a valid Engineer's license, whose firm has been designated (if any designated) within the Contract Documents as the Engineer to provide engineering services on the project.
- CC. Equal: Equal in opinion of Architect. Burden of proof of equality is responsibility of Contractor.
- DD. Exposed: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.
- EE. Final Acceptance or Final Completion: All Work satisfactorily completed in accordance with Contract Documents. It includes, but is not limited to:
1. All Systems having been tested and accepted as having met requirements of Contract Documents.
 2. All required instructions and training sessions having been given by Contractor.
 3. All as-built drawings and operations and maintenance manuals and Machine Inventory Sheets having been submitted by Contractor, reviewed by Architect/Engineer and accepted by Owner.
 4. All punch list work, as directed by Owner, having been completed by Contractor.
 5. Generally all work, except Contractor maintenance after Final Acceptance, having been completed to satisfaction of Owner.
- FF. Force-Account: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other costs, plus a specified percentage for overhead and profit.
- GG. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- HH. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated." No limitation of location is intended.
- II. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- JJ. Inspector: The person engaged by Owner to inspect the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes.
1. The inspector is subject to approval by the Architect, Owner and he will report to Owner.
 2. The terms "Inspector" and "Project Inspector" are used interchangeably in the Contract Documents.
- KK. Latent: Not apparent by reasonable inspection, including but not limited to, the inspections and research required as a condition to bidding under the General Conditions.
- LL. Material or Materials: These words shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.
- MM. Milestone: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.
- NN. Modification: Same as Contract Modification.

- OO. Not in Contract: Work that is outside the scope of work to be performed by Contractor under this Contract.
- PP. Notice of Award: A written notice given by Owner to lowest responsive, responsible bidder advising that Bidder's bid and other qualifying information is acceptable to Owner, requiring Bidder to fulfill the requirements of the Contract.
- QQ. Notice to Proceed: A written notice given by Owner to Contractor fixing the date on which the Contract Time will commence to run and on which contractor shall start to perform Contractor's obligations under the Contract Documents.
- RR. Off Site: Outside geographical location of the Project.
- SS. Owner: Individual or entity named as Owner in Section 01 11 00 "Summary of Work". Unless otherwise expressly indicated or required by the context of usage, the term "Owner" as used in the Contract Documents shall be deemed references to Owner.
- TT. Owner-Furnished, Contractor-Installed: Items furnished by Owner at its cost for installation by Contractor at its cost under this Contract.
- UU. Owner Representative(s): The person or persons assigned by Owner to be Owner's representatives or, if so designated, agent(s) at the site.
- VV. Progress Report: a periodic report submitted by Contractor to Owner with progress payment invoices accompanying actual work accomplished to the Project Schedule.
1. See Document 00 600 General Conditions.
- WW. Project: Total construction of which Work performed under this Contract may be whole or part.
- XX. Project Manual: Project Manual consists of Bidding Requirements, Agreement, Bonds, Certificates, Contract Conditions, and Specifications. The Project Manual is deemed to include and incorporate all matters noted in any Addenda issued by or on behalf of the Owner during the bidding for the Work.
- YY. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- ZZ. Provide": Furnish and install, complete and ready for the intended use.
- AAA. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- BBB. Request for Interpretation (RFI): A document prepared by Contractor, Owner or Architect/Engineer requesting information from one of the parties regarding the Project or Contract Documents. The RFI system is also a means for Owner and Architect to submit Contract Document clarifications or supplements to Contractor.
- CCC. Required: "As required", "As needed", "As necessary" and terms of similar import, where used, shall mean as required or as needed to complete the item or effort in question in accordance with the Contract Documents, applicable standards and specifications for the quality indicated.
- DDD. RFI-Reply: A document consisting of supplementary details, instructions or information issued by the Architect/Engineer, which clarifies or supplements Contract Documents and with which Contractor shall comply. RFI-Replies do not constitute changes in Contract Sum or Contract Times except as otherwise agreed in writing by Owner. RFI-Replies will be issued through the RFI administrative system.

- EEE. Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
- FFF. Shop Drawings: All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the work.
- GGG. Shown: As indicated on Drawings.
- HHH. Site: The particular geographical location of Work performed pursuant to Contract, including staging areas, work areas, storage and lay down areas, access and parking.
- III. Specifications: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.
- JJJ. Specified: As written in Specifications.
- KKK. Subcontractor: A person or entity who has a direct contract with Contractor to perform a portion of the Work at the site. The term "subcontractor" is referred to throughout the Contract Documents as if singular in number and neuter in gender and means a subcontractor or an authorized representative of the subcontractor. The term "subcontractor" does not include a separate contractor or subcontractors of a separate contractor.
- LLL. Substantial Completion: The Work (or a specified part thereof) has progressed to the point where, in the opinion of the Architect/Engineer as evidenced by a Certificate of Substantial Completion, it is sufficiently complete, in accordance with Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work is complete and ready for final payment is evidenced by written recommendation of the Architect/Engineer for final payment. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.
- MMM. Supplemental Instruction: A written work change directive to Contractor from Architect/Engineer, approved by Architect, ordering alterations or modifications which do not result in change in Contract Sum or Contract Times, and do not substantially change Drawings or Specifications.
- NNN. Underground Facilities: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: Electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.
- OOO. Work: The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all is required by the Contract Documents. Wherever the word "work" is used, rather than the word "Work", it shall be understood to have its ordinary and customary meaning.
1. Wherever words "as directed", "as required", "as permitted", or words of like effect are used, it shall be understood that direction, requirements, or permission of Owner or Architect is intended. Words "sufficient", "necessary", "proper", and the like shall mean sufficient, necessary or proper in judgment of Owner or Architect. Words "approved", "acceptable", "satisfactory", "favorably reviewed" or words of like import, shall mean approved by, or acceptable to, or satisfactory to, or favorably reviewed by Owner or Architect.
 2. Wherever the word "may" is used, the action to which it refers is discretionary. Wherever the word "shall" is used, the action to which it refers is mandatory.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.
- D. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or laws or regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.
- E. Except as otherwise specifically stated in the Contract Documents or as may be provided by Change Order, or supplemental instruction, the provisions of the Contract Documents shall take precedence in resolving conflicts, errors, ambiguity or discrepancy between the Contract Documents and:
 - 1. The provisions of standards, specifications, manuals, codes, or instructions (whether or not specifically incorporated by reference in the Contract Documents); or
 - 2. The provisions of laws or regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such law or regulation).
- F. No provision of referenced standards, specifications, manuals, codes or instructions shall be effective to change the duties and responsibilities of Owner, Contractor or Architect/Engineer, or their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to Owner, Architect/Engineer or their consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

1.4 REPORTING AND RESOLVING DISCREPANCIES

- A. Report in writing at once to Owner, with copies to Architect, all conflicts, errors, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and provisions of laws or regulations applicable to the performance of the Work or of standards, specifications, manual, codes or instructions of manufacturers or suppliers. Do not proceed with the Work affected until direction to do so is given by the Architect.

1.5 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
8. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
9. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
10. AF&PA - American Forest & Paper Association; www.afandpa.org.
11. AGA - American Gas Association; www.aga.org.
12. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
13. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
14. AI - Asphalt Institute; www.asphaltinstitute.org.
15. AIA - American Institute of Architects (The); www.aia.org.
16. AISC - American Institute of Steel Construction; www.aisc.org.
17. AISI - American Iron and Steel Institute; www.steel.org.
18. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
19. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
20. ANSI - American National Standards Institute; www.ansi.org.
21. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
22. APA - APA - The Engineered Wood Association; www.apawood.org.
23. APA - Architectural Precast Association; www.archprecast.org.
24. API - American Petroleum Institute; www.api.org.
25. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
26. ARI - American Refrigeration Institute; (See AHRI).
27. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
28. ASCE - American Society of Civil Engineers; www.asce.org.
29. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
30. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
31. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
32. ASSE - American Society of Safety Engineers (The); www.asse.org.
33. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
34. ASTM - ASTM International; (American Society for Testing and Materials International); www.astm.org.
35. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
36. AWEA - American Wind Energy Association; www.awea.org.
37. AWI - Architectural Woodwork Institute; www.awinet.org.
38. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.

39. AWPA - American Wood Protection Association; (Formerly: American Wood-Preservers' Association); www.awpa.com.
40. AWS - American Welding Society; www.aws.org.
41. AWWA - American Water Works Association; www.awwa.org.
42. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
43. BIA - Brick Industry Association (The); www.gobrick.com.
44. BICSI - BICSI, Inc.; www.bicsi.org.
45. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.com.
46. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
47. BOCA - BOCA; (Building Officials and Code Administrators International Inc.); (See ICC).
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bwfbadminton.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics & Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.
60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
68. CWC - Composite Wood Council; (See CPA).
69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
70. DHI - Door and Hardware Institute; www.dhi.org.
71. ECA - Electronic Components Association; www.ec-central.org.
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECA).
73. EIA - Electronic Industries Alliance; (See TIA).
74. EIMA - EIFS Industry Members Association; www.eima.com.
75. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.

76. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
77. ESTA - Entertainment Services and Technology Association; (See PLASA).
78. EVO - Efficiency Valuation Organization; www.evo-world.org.
79. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
80. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
81. FM Approvals - FM Approvals LLC; www.fmglobal.com.
82. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
83. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarroof.com.
84. FSA - Fluid Sealing Association; www.fluidsealing.com.
85. FSC - Forest Stewardship Council U.S.; www.fscus.org.
86. GA - Gypsum Association; www.gypsum.org.
87. GANA - Glass Association of North America; www.glasswebsite.com.
88. GS - Green Seal; www.greenseal.org.
89. HI - Hydraulic Institute; www.pumps.org.
90. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
91. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
92. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
93. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
94. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
95. IAS - International Approval Services; (See CSA).
96. ICBO - International Conference of Building Officials; (See ICC).
97. ICC - International Code Council; www.iccsafe.org.
98. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
99. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
100. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
101. IEC - International Electrotechnical Commission; www.iec.ch.
102. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
103. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
104. IESNA - Illuminating Engineering Society of North America; (See IES).
105. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
106. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
107. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
108. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
109. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
110. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
111. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).

112. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
113. ISO - International Organization for Standardization; www.iso.org.
114. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
115. ITU - International Telecommunication Union; www.itu.int/home.
116. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
117. LMA - Laminating Materials Association; (See CPA).
118. LPI - Lightning Protection Institute; www.lightning.org.
119. MBMA - Metal Building Manufacturers Association; www.mbma.com.
120. MCA - Metal Construction Association; www.metalconstruction.org.
121. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
122. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
123. MHIA - Material Handling Industry of America; www.mhia.org.
124. MIA - Marble Institute of America; www.marble-institute.com.
125. MMPA - Moulding & Millwork Producers Association; (Formerly: Wood Moulding & Millwork Producers Association); www.wmmpa.com.
126. MPI - Master Painters Institute; www.paintinfo.com.
127. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
128. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
129. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
130. NADCA - National Air Duct Cleaners Association; www.nadca.com.
131. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
132. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
133. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
134. NCMA - National Concrete Masonry Association; www.ncma.org.
135. NEBB - National Environmental Balancing Bureau; www.nebb.org.
136. NECA - National Electrical Contractors Association; www.necanet.org.
137. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
138. NEMA - National Electrical Manufacturers Association; www.nema.org.
139. NETA - InterNational Electrical Testing Association; www.netaworld.org.
140. NFHS - National Federation of State High School Associations; www.nfhs.org.
141. NFPA - NFPA; (National Fire Protection Association); www.nfpa.org.
142. NFPA - NFPA International; (See NFPA).
143. NFRC - National Fenestration Rating Council; www.nfrc.org.
144. NHLA - National Hardwood Lumber Association; www.nhla.com.
145. NLGA - National Lumber Grades Authority; www.nlga.org.
146. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
147. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
148. NRCA - National Roofing Contractors Association; www.nrca.net.

149. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
150. NSF - NSF International; (National Sanitation Foundation International); www.nsf.org.
151. NSPE - National Society of Professional Engineers; www.nspe.org.
152. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
153. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
154. NWFA - National Wood Flooring Association; www.nwfa.org.
155. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
156. PDI - Plumbing & Drainage Institute; www.pdionline.org.
157. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
158. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
159. RFCI - Resilient Floor Covering Institute; www.rfci.com.
160. RIS - Redwood Inspection Service; www.redwoodinspection.com.
161. SAE - SAE International; (Society of Automotive Engineers); www.sae.org.
162. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
163. SDI - Steel Deck Institute; www.sdi.org.
164. SDI - Steel Door Institute; www.steeldoor.org.
165. SEFA - Scientific Equipment and Furniture Association; www.sefalabs.com.
166. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
167. SIA - Security Industry Association; www.siaonline.org.
168. SJI - Steel Joist Institute; www.steeljoist.org.
169. SMA - Screen Manufacturers Association; www.smainfo.org.
170. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
171. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
172. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
173. SPIB - Southern Pine Inspection Bureau; www.spib.org.
174. SPRI - Single Ply Roofing Industry; www.spri.org.
175. SRCC - Solar Rating and Certification Corporation; www.solar-rating.org.
176. SSINA - Specialty Steel Industry of North America; www.ssina.com.
177. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
178. STI - Steel Tank Institute; www.steeltank.com.
179. SWI - Steel Window Institute; www.steelwindows.com.
180. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
181. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
182. TCNA - Tile Council of North America, Inc.; (Formerly: Tile Council of America); www.tileusa.com.
183. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
184. TIA - Telecommunications Industry Association; (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
185. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).

186. TMS - The Masonry Society; www.masonrysociety.org.
 187. TPI - Truss Plate Institute; www.tpinst.org.
 188. TPI - Turfgrass Producers International; www.turfgrasssod.org.
 189. TRI - Tile Roofing Institute; www.tilerroofing.org.
 190. UBC - Uniform Building Code; (See ICC).
 191. UL - Underwriters Laboratories Inc.; www.ul.com.
 192. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
 193. USAV - USA Volleyball; www.usavolleyball.org.
 194. USGBC - U.S. Green Building Council; www.usgbc.org.
 195. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
 196. WASTEC - Waste Equipment Technology Association; www.wastec.org.
 197. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
 198. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
 199. WDMA - Window & Door Manufacturers Association; www.wdma.com.
 200. WI - Woodwork Institute; (Formerly: WIC - Woodwork Institute of California); www.wicnet.org.
 201. WMMPA - Wood Moulding & Millwork Producers Association; (See MMPA).
 202. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
 203. WPA - Western Wood Products Association; www.wwpa.org.
- C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. DIN - Deutsches Institut für Normung e.V.; www.din.de.
 2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
 3. ICC - International Code Council; www.iccsafe.org.
 4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up-to-date as of the date of the Contract Documents.
1. COE - Army Corps of Engineers; www.usace.army.mil.
 2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
 3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 4. DOD - Department of Defense; <http://dodssp.daps.dla.mil>.
 5. DOE - Department of Energy; www.energy.gov.
 6. EPA - Environmental Protection Agency; www.epa.gov.
 7. FAA - Federal Aviation Administration; www.faa.gov.
 8. FG - Federal Government Publications; www.gpo.gov.
 9. GSA - General Services Administration; www.gsa.gov.
 10. HUD - Department of Housing and Urban Development; www.hud.gov.
 11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; <http://eetd.lbl.gov>.

12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
 13. SD - Department of State; www.state.gov.
 14. TRB - Transportation Research Board; National Cooperative Highway Research Program; www.trb.org.
 15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
 16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
 17. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
 18. USP - U.S. Pharmacopeia; www.usp.org.
 19. USPS - United States Postal Service; www.usps.com.
- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 2. DOD - Department of Defense; Military Specifications and Standards; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 3. DSCC - Defense Supply Center Columbus; (See FS).
 4. FED-STD - Federal Standard; (See FS).
 5. FS - Federal Specification; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
 6. MILSPEC - Military Specification and Standards; (See DOD).
 7. USAB - United States Access Board; www.access-board.gov.
 8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CBHF - State of California; Department of Consumer Affairs; Bureau of Electronic Appliance and Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
 2. CCR - California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
 3. CDHS - California Department of Health Services; (See CDPH).
 4. CDPH - California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
 5. CPUC - California Public Utilities Commission; www.cpuc.ca.gov.
 6. SCAQMD - South Coast Air Quality Management District; www.aqmd.gov.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 42 00

SECTION 01 43 39

MOCKUP REQUIREMENTS

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. Construct mockups prior to installation of final work, to permit review of appearance, quality, coordination, compatibility and relation to adjacent work, and to test alternate colors and finishes of materials. Provide mockup identical in every respect to the final work specified.
- B. Construct mockups out of sequence as part of the Contract.
- C. Mockups will remain in place through the completion of the work and shall serve as standard for appearance and other attributes as specifically noted by the Architect.
- D. Provide design by Contractor's engineer as required to ensure the structural stability of mockups.
- E. Architect and other interested parties will make visual examination of the mockup during construction.

1.3 RELATED REQUIREMENTS

- A. Pertinent sections of other Divisions specifying mockups.

1.4 DEFINITIONS

- A. Mockup: Independent structures that represent components of a portion of the building as indicated, and where located, on the Drawings.

1.5 ACTION SUBMITTALS

- A. Sequence: All required submittals must be accepted prior to construction of mockup including but not limited to product data, samples and shop drawings as required.
 - 1. Project Schedule shall take account of early submittal requirements of these items to Architect for review and approval.
 - 2. Samples: All selection samples and verification must be approved prior to preparation of mockup.
- B. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer and bearing his seal and signature, detailing fabrication and assembly of mockups.
 - 1. Provide fully detailed drawings showing all components, including bracing and footings for independent elements which are required for free-standing mockup, although not part of the mockup itself.
 - 2. Identify all assembly components and materials, indicate means of full integration with surrounding adjacent materials.
 - 3. Include all details showing edges, perimeters, junctions and transitions, seals, sealant details, re-glazing details, water collection and drainage systems, anchorage and all other pertinent details necessary to illustrate and verify the performance capabilities of the proposed assembly.

- C. Product Data for any materials not currently listed in specifications as alternates.
- D. Delegated-Design Submittal: For mockup supporting structure, when mockups are not constructed in situ.
 - 1. Structural Calculations: Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation, registered in the State where the project is located demonstrating compliance with referenced code and specified criteria.
- E. Construction Schedule: Include mockup activities including administrative and procedural submittals and materials ordering and assembly on Construction Schedule. Identify every element required for each mockup. Allow ample advance time for preparation and approval of mockup prior to placement of final orders for work without delay to progress or completion of the work.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Professional Engineer.

1.7 QUALITY ASSURANCE

- A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of mockups that are similar to those indicated for this Project in material, design, and extent.
- B. Installer Qualifications: Installer experienced in performing work of the section who has specialized in installation of work similar to that required for this project and who will perform installation of final work.
- C. Comply with standards specified for permanent work.
- D. Secure mockup in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.
- E. Provide finish to match approved samples.

1.8 SCHEDULING

- A. Notify Architect at the start of construction of mockup and provide progress reports to allow the Architect to schedule observations of mockups.
- B. After approximately 50 percent of each mockup has been constructed, request the Architect's preliminary review before completion. Incorporate changes or variations requested by the Architect into the mockup during their construction and prior to their completion, insofar as possible.
- C. Obtain Architect and Owner Representative's acceptance of visual qualities of the mockup prior to commencing the corresponding work for the Project.
- D. Schedule the completion and reworking of mockup necessary to obtain acceptance to avoid delay in the construction schedule of the Project. Update the Construction Schedule to reflect required revisions to mockup.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Design Loads and Performance Criteria: As specified in the technical sections.
- B. Delegated Design: Engage a qualified professional engineer to design mockup supports.

- C. Provide full size mockup of typical wall construction and other elements as specified in accordance with details on Drawings in the sizes indicated, or if not indicated, in size and in location(s) directed by Architect.
 - 1. Construction shall be by the same personnel employed for the final work.
 - 2. Demonstrate aesthetic effects, establish quality standards for fabrication and installation and provide examples for testing as specified in related section.
- D. Mockups shall be free-standing and shall not be incorporated into the final work, unless otherwise approved by the Architect in writing.
- E. Assemble and erect complete, with specified attachment and anchorage devices, flashings, seals and finishes.
- F. Coordination: Utilize mockups to ascertain elements as designed fit into space provided and to coordinate and sequence work of multiple sections in an assembly.
- G. Should mockup fail to meet the Architect and Owner Representative's approval, take down or rework until acceptable.
- H. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- I. Approved mockup will form the standard for comparison for Architect's judging aesthetic qualities of the finished work, including the interface with adjacent materials and components, as applicable.
 - 1. Make modifications required by Architect to achieve acceptable mockups, at no additional cost to the Owner.
 - 2. Mockup will be used by the Architect to test color and material alternatives and to review and accept final colors, textures and finishes. Up to 5 different colors may be tested for each component.
 - 3. Some mockups will be used for exterior façade testing as specified in related section 01 45 53 4000.
- J. Remove unacceptable mockups from the site immediately
- K. Mockup shall be approved by the Architect and Owner's Representative in writing, as a condition precedent to approval of shop drawings for work represented by the mockups.

2.2 MOCKUP DESCRIPTION

- A. Refer to drawings and various technical sections for descriptions of mockups and in-place installations required for review of materials and coordination.
 - 1. Mockup to incorporate items from exterior cladding, weather barriers, metal flashings, and fenestration items from Divisions 03, 04, 07, and 08.
- B. Provide quality control over work of various sections of specifications, manufacturers, products, services, workmanship, and site conditions to produce mockup in accordance with the Contract Documents.

2.3 MATERIALS AND COMPONENTS

- A. Materials and finishes shall comply with the requirements specified in the various applicable Sections of the Specifications, and shall match previously submitted and approved samples.
- B. Mockup shall include all related construction materials and finishes having a visual or technical effect upon the completed work.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine conditions with installer present and verify that field conditions are acceptable and are ready to receive work. Correct conditions detrimental to the proper and timely performance of this work before proceeding with installation. Commencement of work indicates acceptance of substrates

3.2 INSTALLATION

- A. Install components in strict accordance with manufacturer's instructions and approved shop drawings. Use proper fasteners and hardware for material attachments as specified and as required to suit field conditions.
- B. Install items plumb and level, measured from established lines and levels, accurately fitted, free from distortion or defects.
- C. Provide temporary bracing or anchors in formwork for items which are to be built into concrete or similar construction.
- D. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- E. Install materials in a manner that will duplicate the appearance in the completed building.
 - 1. Provide materials and personnel for prompt continuous construction of mock-ups.
 - 2. In constructing mockup, take measure to ensure the safety of Project personnel and the public.
 - 3. Construct mockup using the same construction personnel, means, and methods as intended for use on final work.
 - 4. Construct mockup in accordance with details indicated on the drawings and approved Shop Drawings.
 - 5. Mockups shall be located where specified or directed, and shall not be built "in-place" as part of the permanent construction.
- F. Construct mockup test specimens to match details shown in the architectural drawings under the manufacturer's/installer's direct supervision and employ workmen as they would be employed during the final construction at the job site.
 - 1. Construct in strict accordance with endorsed shop drawings. Any deviations from or additions to details shown on drawings are subject to final review and action by the Architect.
 - 2. Mockup test specimens shall be full size and fully represent the conditions of final construction including structural design of members and anchorages. Mock up specimens shall include not only the window but the surrounding framing, flashings, wall finishes and related materials.
 - 3. Mockup test specimens shall include joint sealants, glazing, and finishes. Install sufficient interior trim, mullion and horizontal covers to demonstrate details of completed work. Leave trim installed to demonstrate that design is not affected by testing criteria.
 - 4. Provide at least one extra light of glass for each type and size used for glazed mockups. Replace glass breaking during testing with new glass and continue tests.
 - 5. Repeated material breakage shall constitute failure. Prior to testing remove and re-glaze selected glass lites, using details and procedures intended for glass replacement on the actual building. Re-glazed lites must satisfy all test criteria.
- G. Record Drawings for Mockups:
 - 1. Prepare record drawings for mockups as specified in related Section 01 45 53.

3.3 PROTECTION

- A. Protect and maintain mockup until completion of construction or until removal is directed.
- B. Repair damage to mockup immediately upon occurrence. Maintain mockup and surrounding site in a safe and clean condition.
- C. Do not permit traffic near unprotected finish surface(s).

3.4 REMOVAL

- A. Remove mockup at the completion of the work in a manner that shows no evidence of mockup previous existence. Complete site work at area of mockups in accordance with Contract Drawings.

END OF SECTION 01 43 39

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SECTION 01 45 23 - TESTING AND INSPECTION

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. Work Included:
 - 1. Testing Agency selection, payment, and duties.
 - 2. Testing Agency limits on authority.
 - 3. Contractor responsibilities.
 - 4. Architect/Engineer responsibilities.
 - 5. Deficient work procedures.

1.3 RELATED REQUIREMENTS

- A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
- B. Testing Agency inspection, sampling, and testing is required as listed in Drawings and as noted in Specification divisions.

1.4 REFERENCES

- A. Installer Qualifications: Installer who is trained and approved for installation of units required for this Project.
- B. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTALS

- A. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
- B. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect, Engineer, and Project inspector, with additional copies to other parties as noted.

1.6 QUALITY ASSURANCE

- A. Conform to requirements of the referenced standards.
- B. Laboratory: Authorized to operate in State in which Project is located.

- C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.7 TESTING AGENCY SELECTION AND PAYMENT

- A. Owner will employ and pay for the services of an Independent Testing Agency, herein after called the Owner's Testing Agency, to perform specific testing, in accordance with the pertinent Building Code requirements and the Specifications.
- B. Owner will pay for initial testing indicated under specific specification sections and specifically noted to be paid by the Owner.
- C. Contractor shall pay for testing when:
 - 1. Additional tests and inspections by Owner's testing agency where initial tests and inspections reveal failure to meet Contract requirements.
 - 2. Excessive inspection time by Owner's testing agency is required by Contractor's failure to provide sufficient workman or to properly pursue the progress of work.
 - 3. Test(s) deemed necessary by the Owner/Architect to evaluate any substitution proposed by the Contractor.
 - 4. Testing and inspection for the Contractor's convenience.
 - 5. Testing and inspection overtime necessitated by the Contractor's schedule.
- D. Employment of any testing laboratory by Contractor shall be subject to Owner approval; laboratory shall be under direct supervision of a registered Engineer and shall conform to ASTM E 329.
 - 1. Laboratory of concrete producer shall not be acceptable for concrete mix designs.
- E. Owner reserves the right to test any material or work of Project at any time, whether or not tests are indicated in Contract Documents.

1.8 TESTING AGENCY DUTIES

- A. Cooperate with Architect and Contractor: provide qualified personnel after due notice.
- B. Perform specified reviews, inspections, sampling and testing of materials and methods of construction, as specified by the various technical specifications sections, and as requested by the Architect or Owner.
- C. Provide qualified personnel at site. Cooperate with Architect/Engineer and Contractor in performance of services.
- D. Perform specified sampling and testing of Products in accordance with specified standards. Ascertain compliance of materials with requirements of Contract Documents.
- E. Promptly submit written report of each test and inspection; one copy each to Architect, Engineer, Owner, Contractor, and one copy to Record Documents File. Each report shall include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing Agency name, address and telephone number.
 - 4. Name and signature of Agency inspector.
 - 5. Date and time of sampling or inspection.
 - 6. Record of temperature and weather conditions.

7. Date of test.
 8. Identification of product and specification section.
 9. Location of sample or test in the Project.
 10. Type of inspection or test.
 11. Results of tests and
 12. Compliance or Non-compliance with Contract Documents, specifically noted.
- F. Promptly notify Architect and Contractor of observed irregularities or deficiencies of work or products.
- G. Interpretation of test results, when requested by Architect.
- H. Perform additional tests as required by Architect or the Owner.
- I. Attend preconstruction meetings and progress meetings.
- 1.9 LIMITATIONS OF AUTHORITY OF TESTING AGENCY
- A. Agency is not authorized to:
1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 2. Approve or accept any portion of the Work.
 3. Perform any duties of the Contractor.
 4. Agency or laboratory has no authority to stop the Work.
- 1.10 CONTRACTOR'S RESPONSIBILITIES
- A. Contractor shall cooperate with the Agency to facilitate the execution of its required services.
- B. Employment of the Agency shall in no way relieve Contractor's obligations to perform the Work of the Contract.
- C. Cooperate with Agency personnel; provide access to work; to manufacturer's operations.
- D. Provide information regarding activities requiring special inspection and tests to Owner's inspection and Testing Agency upon request.
- E. Secure and deliver to the Agency adequate quantities of representational samples of materials proposed to be used and which require testing.
- F. Provide to the Agency the design mixes and material properties proposed to be used for concrete, and other materials and material mixes which require control by the testing Agency .
- G. Furnish copies of Products and Material test reports, certifications and affidavits as required.
- H. Furnish incidental labor and facilities:
1. To provide access to Work to be tested.
 2. To obtain and handle samples at the Project site or at the source of the product to be tested.
 3. To facilitate inspections and tests.
 4. To provide storage and curing of test samples.
- I. Notify Agency sufficiently in advance of operations to allow for Agency assignment of personnel and scheduling of tests.

1. Notify agency or laboratory and Architect/Engineer forty-eight (48) hours prior to expected time for operations requiring testing services.
 2. Become familiar with time constraints of tests required. Schedule work to allow time for performance of required tests.
- J. When tests or inspections cannot be performed after such notice the cost to the Owner for Agency personnel and travel expenses incurred due to Contractor's negligence shall be deducted from the Contract Price.
- K. Make arrangements with Agency and pay for additional samples and tests required for Contractor's convenience.
- L. Schedule Fabrication Work for Efficient Inspection and Testing: Testing Agency costs for steel fabrication inspections are based on Inspector capacity to inspect work of 3-5 welders simultaneously.
1. Contractor shall cause steel fabricator to schedule his work such that maximum use is made of the inspector's time.
 2. If Contractor does not schedule fabricator work efficiently, the costs of excess inspection charges shall be paid by the Owner and deducted from the Contract Sums owed to the Contractor as specified below for re-testing of deficient work.
- M. Incur expenses due to re-testing and re-inspection necessitated by improperly performed work.
- N. Expenses incurred by the Testing Agency due to re-testing and re-inspection necessitated by non-conformance of work and testing and inspection required for compliance of substitutions to the specifications shall be deducted from the Contract Price.
- 1.11 ARCHITECT/ENGINEER RESPONSIBILITIES
- A. Architect/Engineer is not responsible for notification of the Testing Agency or scheduling its work.
 - B. Architect will not be responsible for the actions of the Testing Agency.
- 1.12 DEFICIENT WORK AND RE-TESTING
- A. When initial tests indicate non-compliance with the Contract Documents, subsequent re-testing shall be performed by the same testing Agency and the costs thereof shall be paid by the Owner and deducted from the Contract Sums owed to the Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SCHEDULE OF INSPECTIONS

- A. As indicated in individual specifications.

END OF SECTION 01 45 23

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

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 requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 RELATED REQUIREMENTS

- A. Section 01 11 00 "Summary of Work" for work restrictions and limitations on utility interruptions.

1.4 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Arrangements for Site Utility Usage:
 - 1. Sewer Service: Owner will pay sewer-service use charges for sewer usage by all entities for construction operations;
 - 2. Water Service: Owner will pay water-service use charges for water used by all entities for construction operations;
 - 3. Electric Power Service: Owner will pay electric-power-service use charges for electricity used by all entities for construction operations;
 - 4. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations;
 - 5. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.5 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.

2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

1.6 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.7 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fence Materials: Materials at Contractor's option to prevent unauthorized access to site, but not less than one of the following:
 1. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails .
 2. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.
 3. Wood Enclosure Fence: Plywood, 6 feet (1.8 m) high, framed with four 2-by-4-inch (50-by-100-mm) rails, with preservative-treated wood posts spaced not more than 8 feet (2.4 m) apart.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- C. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).
- D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack and marker boards.
 3. Drinking water and private toilet.
 4. Coffee machine and supplies.
 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
 6. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 77 00 "Closeout Procedures".
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
1. Connect temporary sewers as directed by authorities having jurisdiction.

- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
 - 2. Install electric power service [overhead] [underground] unless otherwise indicated.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 - 2. Install lighting for Project identification sign.
- I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install three telephone line(s) for each field office.
 - 1. Provide additional telephone lines for the following:
 - a. Provide a dedicated telephone line for each facsimile machine in each field office.
 - 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
 - 3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

- J. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:
1. Processor: Intel Pentium D or Intel CoreDuo, 3.0 GHz processing speed.
 2. Memory: 4 gigabyte.
 3. Disk Storage: 500 gigabyte hard-disk drive and combination DVD-RW/CD-RW drive.
 4. Display: 22-inch (560-mm) LCD monitor with 256-Mb dedicated video RAM.
 5. Full-size keyboard and mouse.
 6. Network Connectivity: 10/100 BaseT Ethernet.
 7. Operating System: Microsoft Windows XP Professional or Microsoft Windows Vista Business.
 8. Productivity Software:
 - a. Microsoft Office Professional, XP or higher, including Word, Excel, and Outlook.
 - b. Adobe Reader 7.0 or higher.
 - c. WinZip 7.0 or higher.
 9. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying, scanning, and faxing, or separate units for each of these three functions.
 10. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall, providing minimum 384 Kbps upload and 1 Mbps download speeds at each computer.
 11. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.
 12. Backup: External hard drive, minimum 500 gigabyte, with automated backup software providing daily backups.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.
1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Civil Drawings.
 3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.

4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Civil Drawings.
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Provide temporary parking areas for construction personnel.
- F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 1. Temporary Signs: Provide signs as indicated and as required to inform individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 2. Maintain and touchup signs so they are legible at all times.
- H. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal".
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- J. Temporary Elevator Use: [Use of elevators is not permitted] See related Section(s) specifying Elevators for temporary use of new elevators.
- K. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- L. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 1. Comply with work restrictions specified in Section 01 11 00 "Summary of Work".
- C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit and authorities having jurisdiction, whichever is more stringent and requirements specified in related Sections "Erosion and Sedimentation Control" or "Site Clearing."
 1. Dust Palliation

- a. All unpaved construction areas shall be sprinkled with water or other acceptable South Coast Air Quality Management District (SCAQMD) dust control agents during dust generating activities to reduce dust emissions. Additional watering or acceptable SCAQMD dust control agents shall be applied during dry weather or windy days until dust emissions are not visible.
 - 1) All grading and construction activities shall be suspended when wind speeds exceed 20 miles per hour, as directed by the SCAQMD.
 - 2) Construction sites shall be watered as directed by the City of San Juan Capistrano Department of Public Works and SCAQMD.
 - b. On dry days, dirt or debris spilled onto paved surfaces shall be swept up immediately to reduce resuspension of particulate matter caused by vehicle movement. Approach routes to the Project site shall be cleaned daily of construction related dirt in dry weather.
 - c. On-site stockpiles of excavated material shall be covered or watered.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
 1. The glue traps for pest management is prohibited by local ordinance.”
- G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations or as indicated on Drawings otherwise.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- H. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- J. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- L. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise.
 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.

2. Construct dustproof partitions with two layers of 6-mil (0.14-mm) polyethylene sheet on each side. Cover floor with two layers of 6-mil (0.14-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
 - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.
 3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 4. Insulate partitions to control noise transmission to occupied areas.
 5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 6. Protect air-handling equipment.
 7. Provide walk-off mats at each entrance through temporary partition.
- M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in construction areas.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.

6. Discard, replace, or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use permanent HVAC system to control humidity.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 24 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 CONTINUITY OF SERVICES

- A. Provide temporary panels, raceway, conductors, piping, ductwork and other facilities or equipment as required for continuous operation of utilities in service. Do not allow interruption of utilities.
1. All utility services, such as water, gas, sewers, electricity, data, cable television, communication, clock, bell, security or fire protection system serving the project, or any part of it, shall be maintained in continuous operation at all times for the duration of the contract.
 2. Transfer of utilities function to new systems shall be coordinated in writing with the Owner at least two weeks in advance of the proposed date.
 3. Notify and obtain approval from agencies having jurisdiction over utilities prior to transfer of function.
 4. Coordinate provision and removal of temporary facilities with phasing of construction operations as indicated, or as necessary for continuity of service.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 56 39 -

TEMPORARY TREE AND PLANT PROTECTION

PART 1 GENERAL

1.1 SUMMARY

- A. The Work of this Section Includes: General protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.
- B. Related Requirements:
 - 1. Section 01 50 00 "Temporary Facilities and Controls" for temporary controls, utilities, support facilities, temporary site fencing, and, if applicable, temporary erosion and sedimentation controls if not specified in Section 31 10 00 "Site Clearing".
 - 2. Section 31 10 00 "Site Clearing" for removing existing trees and shrubs and for temporary erosion- and sedimentation-control measures if not specified in Section 01 50 00 "Temporary Facilities and Controls".

1.2 DEFINITIONS

- A. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.
- B. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.
- C. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:
 - a. Tree-service firm's personnel and equipment needed to make progress and avoid delays.
 - b. Arborist's responsibilities.
 - c. Quality-control program.
 - d. Coordination of Work and equipment movement with the locations of protection zones.
 - e. Trenching by hand or with air spade within protection zones.
 - f. Field quality control.

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. General protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction
- B. Shop Drawings:

1. Include plans, elevations, and sections showing trees and plants to be protected, locations of protection-zone fencing and signage, and the relationship between equipment-movement routes and material storage locations with protection zones.
 2. Detail fabrication and assembly of protection-zone fencing and signage.
 3. Indicate extent of utility boring and trenching by hand or with air spade within protection zones.
 4. Include existing irrigation system that will be used to water plants.
- C. Samples: For each type of the following:
1. Organic Mulch: 1-pint (0.5-L) volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
 2. Protection-Zone Fencing: Assembled Samples of manufacturer's standard size made from full-size components.
 3. Protection-Zone Signage: Full-size Samples of each size and text, ready for installation.
- D. Tree-Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
1. Species and size of tree.
 2. Location on site plan. Include unique identifier for each.
 3. Reason for pruning.
 4. Description of pruning to be performed.
 5. Description of maintenance following pruning.
- E. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
- F. Mitigation Requirements: As required by jurisdiction or as developed by arborist, for mitigation of damage to trees and other plantings. Include the following:
1. Local ordinances governing tree mitigation.
 2. Standards established under the approved tree mitigation report developed by the arborist.
 3. "Digital Guide for Plant Appraisal" by Council of Tree and Landscape Appraisers.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Statements: For arborist and tree service firm.
- B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction in accordance with recognized standards and that trees were promptly and properly treated and repaired when damaged.
- C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
- D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
1. Use sufficiently detailed photographs or video recordings.
 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

- E. Quality-control program.

1.6 QUALITY ASSURANCE

- A. Arborist Qualifications: Certified Arborist as certified by ISA.
- B. Tree-Service Firm Qualifications: An experienced tree-service firm that has successfully completed temporary tree- and plant-protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.
- C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection-zone fencing and signage, the arborist's and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.7 FIELD CONDITIONS

- A. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Moving or parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.
- D. Take precautions to protect plants from airborne contaminants, such as paint or fireproofing overspray.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Backfill Soil: Planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
- B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:
 - 1. Type: Shredded hardwood or Ground or shredded bark or Wood and bark chips.
 - 2. Size Range: 3 inches (76 mm) maximum, 1/2 inch (13 mm) minimum.
 - 3. Color: Natural.

- C. Protection-Zone Fencing: Fencing fixed in position and meeting one of the following requirements: Previously used materials may be used when approved by Architect.
 - 1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing fabricated from minimum 2-inch (50-mm) opening, 0.148-inch- (3.76-mm-) diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch- (60-mm-) OD line posts, and 2-7/8-inch- (73-mm-) OD corner and pull posts; with 1-5/8-inch- (42-mm-) OD top rails and 0.177-inch- (4.5-mm-) diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.
 - a. Height: 72 inches (1800 mm).
- D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes pre-punched and reinforced; legibly printed with nonfading lettering and as follows:
 - 1. Size and Text: As indicated on Drawings.
 - 2. Lettering: 3-inch- (76-mm-) high minimum, black characters on white background.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

- A. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Flag each tree trunk at 54 inches (1372 mm) above the ground.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

3.3 TREE PROTECTION

- A. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.
 - 1. Apply 4-inch (100-mm) uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches (150 mm) of tree trunks.
 - 2. Install temporary root-protection matting over mulch to the extent indicated.
- B. Trunk Protection: Protect the trunk of each tree to remain as follows:
 - 1. Install 2-by-6-inch (50-by-150-mm) wood planks around trunk at maximum 3 inches (76 mm) apart. Minimum three planks per tree. Band together with no less than three steel bands stapled to the planks to hold them securely in place.

3.4 PROTECTION ZONES

- A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and animals from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where

fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

1. Chain-Link Fencing: Install to comply with ASTM F567 and with manufacturer's written instructions.
 2. Access Gates: Install where indicated; adjust to operate smoothly, easily, and quietly; free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect. Install one sign spaced approximately every 35 ft. (10.5 m) on protection-zone fencing, but no fewer than four signs with each facing a different direction.
- C. Maintain protection zones free of weeds and trash.
- D. Maintain hydration of plants to assure plant survival.
- E. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.
1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
 2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.5 EXCAVATION

- A. General: Excavate at edge of protection zones and for trenches indicated within protection zones in accordance with requirements in Section 31 20 00 "Earth Moving" unless otherwise indicated.
- B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.

3.6 ROOT PRUNING

- A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as indicated on Drawings
1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
 2. Cut Ends: Do not paint cut root ends.
 3. Temporarily support and protect roots from damage until they are permanently covered with soil.
 4. Cover exposed roots with burlap and water regularly.
 5. Backfill as soon as possible in accordance with requirements in Section 31 20 00 "Earth Moving."
- B. Root Pruning at Edge of Protection Zone: Prune tree roots flush with the edge of the protection zone by cleanly cutting all roots to the depth of the required excavation.

- C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.7 CROWN PRUNING

- A. Prune branches that are affected by temporary and permanent construction. Prune branches as indicated on Drawings, under direction of arborist.
 - 1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
 - 2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
 - 3. Pruning Standards: Prune trees in accordance with ANSI A300 (Part 1) and as indicated on Drawings.
- B. Unless otherwise directed by arborist and acceptable to Architect, do not cut tree leaders.
- C. Cut branches with sharp pruning instruments; do not break or chop.
- D. Do not paint or apply sealants to wounds.
- E. Provide subsequent maintenance pruning during Contract period as recommended by arborist.
- F. Chip removed branches and spread over areas identified by Architect.

3.8 REGRADING

- A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.
 - 1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.
- C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- D. Minor Fill within Protection Zone: Where existing grade is 2 inches (50 mm) or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.9 FIELD QUALITY CONTROL

- A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.10 REPAIR AND REPLACEMENT

- A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Architect.
 - 1. Submit details of proposed pruning and repairs.
 - 2. Perform repairs of damaged trunks, branches, and roots within 24 hours in accordance with arborist's written instructions.

3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.
- B. Trees: Remove and replace trees indicated to remain that are more than 66 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.
1. Small Trees: Provide new trees of same size and species as those being replaced for each tree that measures 4 inches (100 mm) or smaller in caliper size.
 2. Large Trees: Provide one new tree(s) of 6-inch (150-mm) caliper size for each tree being replaced that measures more than 4 inches (100 mm) in caliper size.
 - a. Species: As selected by Architect.
 3. Plant and maintain new trees as specified in Division 32.

END OF SECTION 01 56 39

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SECTION 01 57 13 -

TEMPORARY EROSION AND SEDIMENT CONTROL

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. All temporary erosion and sediment control on the project site.
- B. This Section includes:
 - 1. Prevention of erosion due to construction activities.
 - 2. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
 - 3. Restoration of areas eroded due to insufficient preventive measures.
 - 4. Compensation of owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.3 SUBMITTALS

- A. Contractor shall submit shop drawings or material certifications for all manufactured erosion and sediment control measures.
- B. Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
- C. Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.
- D. Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

1.4 PROJECT REQUIREMENTS

- A. Conduct stormwater pre-construction meeting with Architect, Owner, sub-contractors, Engineer, and Authority Having Jurisdiction.
- B. Install sediment control measures prior to grading activities.
- C. Coordinate and schedule the Work of subcontractors such that erosion and sediment control measures are fully executed for each operation and in a timely manner over the duration of the Project.
- D. Prior to Project shutdown for weather or other periods of a week or more, the Site shall be adequately protected from erosion and off-site damage by covering exposed soils and establishing perimeter controls.
- E. Control increased storm water runoff due to construction activities.

1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
 - F. Minimize wind, water, and vehicular erosion of soil on project site due to construction activities.
 1. Control movement of sediment and soil from temporary stockpiles of soil.
 2. Prevent development of ruts due to equipment and vehicular traffic.
 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to owner.
 - G. Prevent erosion of soil and deposition of sediment on other properties caused by water runoff and construction activities.
 1. Prevent windblown soil from leaving the project site.
 2. Prevent tracking of mud onto public roads outside site.
 3. Prevent mud and sediment from flowing onto sidewalks and pavements.
 4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to owner.
 - H. Prevent sedimentation of waterways on project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 1. If sedimentation occurs, install or correct preventive measures immediately; remove deposited sediments; comply with requirements of authorities having jurisdiction.
 2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
 - I. Prevent sedimentation of waterways off project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 1. If sedimentation occurs, install or correct preventive measures immediately; remove deposited sediments; comply with requirements of authorities having jurisdiction.
 - J. Prevent standing water that could become stagnant.
 - K. Maintain temporary preventive measures until permanent measures have been established.
- 1.5 CLOSEOUT SUBMITTALS

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Use materials which comply with federal regulations by the EPA under the Clean Water Act (CWA), National Pollutant Discharge Elimination System (NPDES) and Stormwater Pollution Prevention Plan (SWPPP), to include but not limited to:
 1. Silt fencing.
 2. Waddles.
 3. Storm drain inlet protection.
 4. Sediment trap/ basins.
 5. Street sweepers.
 6. Mulch.

7. Erosion control blankets.

PART 3 EXECUTION

3.1 MAINTENANCE

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at project site, and daily during prolonged rainfall.
- B. Repair deficiencies immediately.
- C. Clean out temporary sediment control structures weekly and relocate soil on site.
- D. Place sediment in appropriate locations on site; do not remove from site.

3.2 CLEAN UP

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

END OF SECTION 01 57 13

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SECTION 01 58 00 -

PROJECT IDENTIFICATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes:
 - 1. Project identification signs.
 - 2. General construction signs.

1.3 PROJECT IDENTIFICATION

- A. Provide temporary project identification signs as indicated by Architect and Owner and as required by Authority Having Jurisdiction.
- B. Coordinate sign location, dimension, and design with Architect or as indicated in Contract Documents. Place no other signs on the right-of-way or within the limits of the jobsite.

1.4 GENERAL CONSTRUCTION SIGNS

- A. Provide temporary general construction signs and field office identification signs as indicated by Architect and Owner and as required by Authority Having Jurisdiction. Provide identification signs for all field offices.
- B. Coordinate sign location, dimension, and design with Architect or as indicated in Contract Documents.
 - 1. General construction signs shall be constructed from a sheet of plywood four feet by eight feet or three feet by six feet in size, as appropriate for the location, mounted on two posts set in the ground.
 - 2. Field office signs shall be of similar design, three feet by six feet in size, for wall or post mounting, as appropriate for the location.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Sign faces shall be constructed of 3/4-inch thick, five ply, exterior grade, A-B-faced, Douglas-fir plywood, APA-grade-stamped. The frame shall be nominal two by two or two-by four stock, either construction-grade Douglas fir or A-grade redwood. Posts shall be four by six construction-grade Douglas fir, pressure preservative-treated, eight to 12 feet long, as required for location.
 - 1. Sign posts shall be installed in the ground three feet deep, with the top of the sign horizontal, level, and even with the top of the posts, seven feet minimum above the ground.
- B. Signs shall receive one coat of primer sealer and two base coats of exterior semi-gloss enamel. Letters and logos and indicated by Architect and Owner, or as indicated in Contract documents.
- C. Keep signs clean and in good repair until Substantial Completion of Contract.

PART 3 EXECUTION

3.1 CLOSEOUT

- A. Upon completion of the Work, signs shall be left in place or removed and disposed of as determined by Architect and Owner.

END OF SECTION 01 58 00

SECTION 01 60 00

PRODUCT REQUIREMENTS

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 administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 RELATED REQUIREMENTS

- A. Section 01 25 00 "Substitution Procedures" for requests for substitutions.
- B. Section 01 42 00 "References" for applicable industry standards for products specified.

1.4 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.5 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of

receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Section 01 33 00 "Submittal Procedures."
- b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.

1.6 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.8 PRODUCT WARRANTIES

- A. Warranties specified in other Sections 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.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. All subcontractors to obtain copies of 01 81 13 Sustainable Design Requirements, 01 74 19 Construction Waste Management and Disposal and 01 57 21 Indoor Air Quality Management.
- B. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 - 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- C. Product Selection Procedures:
 - 1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 3. Products:

- a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
- a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- D. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.
- E. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.
- B. Comparable products must meet all applicable LEED requirements.

2.3 PRODUCT REQUIREMENTS

- A. **Salient Physical Attributes:** Physical and other characteristics of products which may not be individually noted in the specifications are essential parts of the product specification. Products shall possess all attributes set forth in the manufacturer's catalog description for the specified item, except for such modifications thereto as may be indicated in the Contract Documents. Such attributes include:
1. **Size:** Dimensions, Form Factor (relative proportions of height, width, depth), Configuration. Ability to fit in space provided, without change to other assemblies or systems, set in place for use without reconfiguration.
 2. **Capacity:** Ability to fulfill specified requirements.
 3. **Weight:** Ability to be supported and braced by structure as shown.
 4. **Physical arrangement of connections or ports:** Intakes, exhausts, utility connections and other such items; their dimensions, form factors and relative proportions. Connect to other systems, ductwork, utilities, controls without changes to other systems.
 5. **Required Clearances:** Vertical, horizontal, to other equipment or construction, other similar attributes.
- B. **Proprietary Names, Catalog Numbers and Identification:** These attributes may be included for convenience in identifying products. Unless modified by Specifications or notation on Drawings, manufacturer's complete product catalog description for indicated product name or number shall constitute requirements for each product as if fully included in the product specification. Products shall incorporate all features set forth in the manufacturer's catalog description for the standard item, except for such modifications thereto as may be indicated in the Contract Documents.
- C. Proprietary names, catalog numbers, and specific requirements as may be set forth, are given to establish standard of design and quality for materials, construction and workmanship. Use of this information to identify products is not intended to preclude use of alternate products by other manufacturers, except as specified in that given section.
- D. **Manufacturer's Requirements:** All deviations from design requirements shown or specified, resulting either from Contractor's or supplier's change of model, or manufacturer's recommendation, or from submitted alternates or accepted substitutions, shall be clearly indicated on the Contractor's submittals. Contractor shall provide all such manufacturer or supplier supplemental requirements at no additional cost.

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 60 00

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SECTION 01 61 16 -

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

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. VOC restrictions for product categories listed below under "DEFINITIONS."
 - 1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- B. All products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.
- C. Listing of a product in these specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).
 - 1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
 - 2. Do not use products which do not meet the requirements of this rule.

1.3 RELATED REQUIREMENTS

- A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this section.
- B. Section 01 81 13 "Sustainable Design Requirements".

1.4 DEFINITIONS

- A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site:
 - 1. Adhesives, sealants, and sealer coatings, regardless of specification section or division.
 - 2. Paints and coatings.
 - 3. Carpet and resilient flooring.
 - 4. Composite wood products; plywood, particleboard, wood fiberboard.
- B. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 REFERENCES

- A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

- B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- C. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
- D. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.
- E. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scscertified.com.

1.6 SUBMITTALS

- A. See Section 01 33 00 - Submittals Procedures.
- B. Evidence of Compliance: Submit for each different product in each applicable category.
 - 1. Identify evidence submittals with the words "CAL-Green VOC Compliance Report".
- C. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
- D. Installer Certifications for Accessory Materials: Require each installer of any type of product, (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.
 - 1. Use the form following this section for installer certifications.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
 - 1. These products may be specified in multiple sections throughout these specifications.
- B. Adhesives: Comply with Title 24, Part 11, Table 5.504.4.1.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
- C. Joint Sealants: Comply with Title 24, Part 11, Table 5.504.4.2.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.

- D. Aerosol Adhesives: Comply with Title 24, Part 11, Table 5.504.4.1. and California Code of Regulations Title 17, Section 94507.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Current GreenSeal Certification.
 - b. Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
 - c. Published product data showing compliance with requirements.

- E. Paints and Coatings: Comply with Title 24, Part 11, Table 5.504.4.3; California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.
 - 1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
 - a. Evidence of Compliance: Acceptable types of evidence are:
 - 1) Report of laboratory testing performed in accordance with requirements.
 - 2) Published product data showing compliance with requirements.
 - 3) Certification by manufacturer that product complies with requirements.
 - 2. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. South Coast Air Quality Management District Rule No.1168.

- F. Composite Wood Products: Comply with Title 24, Part 11, Table 5.504.4.5 formaldehyde limits for hardwood plywood, particleboard, and medium density fiberboard composite wood products.

Title 24, Part 11, Table 5.504.4.5 Composite Wood Products	
Maximum Formaldehyde Emissions in Parts per Million	
PRODUCT	CURRENT LIMIT (JULY 1, 2012)
Hardwood Plywood veneer core	0.05
Hardwood Plywood composite core	0.05
Particleboard	0.09
Medium Density Fiberboard	0.11
Thin Medium Density Fiberboard	0.13

- 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Chain of custody certifications
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
 - d. Other method acceptable to enforcing agency.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

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

3.2 RESTRICTED COMPONENTS

A. Restricted Components:

1. Paints and coatings shall not contain any of the following:

- a. Acrolein.
- b. Acrylonitrile.
- c. Antimony.
- d. Benzene.
- e. Butyl benzyl phthalate.
- f. Cadmium.
- g. Di (2-ethylhexyl) phthalate.
- h. Di-n-butyl phthalate.
- i. Di-n-octyl phthalate.
- j. 1,2-dichlorobenzene.
- k. Diethyl phthalate.
- l. Dimethyl phthalate.
- m. Ethylbenzene.
- n. Formaldehyde.
- o. Hexavalent chromium.
- p. Isophorone.
- q. Lead.
- r. Mercury.
- s. Methyl ethyl ketone.
- t. Methyl isobutyl ketone.
- u. Methylene chloride.
- v. Naphthalene.
- w. Toluene (methylbenzene).
- x. 1,1,1-trichloroethane.
- y. Vinyl chloride.

- B. The following tables are taken from South Coast Air Quality Management District Rule No.1168. All products used shall comply with these limits.

Table 5.504.4.1 ADHESIVE VOC LIMIT

Architectural Applications	Current VOC Limit
Subfloor Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100
Single Ply Roof Membrane Adhesives	250

Table 5.504.4.1 Continued

	VOC Limits and Effective Dates**			
Specialty Applications	Current VOC Limit	1-1-05	7-1-05	1-1-07
PVC Welding	510			
CPVC Welding	490			
ABS Welding	400		325	
Plastic Cement Welding	350	250		
Adhesive Primer for Plastic	650		550	
Contact Adhesive	80			
Special Purpose Contact Adhesive	250			
Tire Retread	100			
Structural Wood Member Adhesive	140			
Top and Trim Adhesive	540			250
** The specified limits remain in effect unless revised limits are listed in subsequent columns.				

Table 5.504.4.1 Continued

For adhesives, adhesive bonding primers, or any other primer not regulated by the above two tables and applied to the following substrates, the following limits shall apply:	
Substrate Specific Applications	Current VOC Limit
Metal to Metal	30
Plastic Foams	50
Porous Material (except wood)	50
Wood	30
Fiberglass 80	

Table 5.504.4.2 SEALANT VOC LIMIT

If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	
Sealant	Current VOC Limit
Architectural	250
Nonmembrane Roof	300
Single-Ply Roof Membrane	450
Other	420
Sealant Primers	Current VOC Limit
Architectural	
Non Porous	250
Porous	775
Modified Bituminous	500
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material as determined in paragraph (b)(32); for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as determined in paragraph (b)(31).	

- C. Paints and Coatings: Architectural Paints and Coatings shall comply with VOC limits in Table 1 of ARB Architectural Coatings Suggested Control Measure, California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green" Table 5.504.4.3. All products used in this category shall comply with these limits, unless more stringent local and regional rules apply.

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)

Grams of VOC per Liter of Coating, less water and less exempt compounds	
COATING CATEGORY	Current VOC Limit 1/1/2012
Flat Coatings	50
Nonflat Coatings	100
Nonflat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350

Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs:	
Clear	730
Opaque	550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Traffic Marking Coatings	100
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

END OF SECTION 01 61 16

INSTALLER CERTIFICATION FORM FOLLOWS

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

FORM

Identification:

- 1. Project Name: _____
- 2. Project No.: _____
- 3. Architect: _____

Use of This Form:

- 4. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
- 5. Contractor is required to obtain and submit this form from each installer of work on this project.
- 6. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
- 7. If any of these accessory materials has been used, attach to this form product data and MSDS sheet for each such product.

VOC content restrictions are specified in Section 01 61 16.

PRODUCT CERTIFICATION

I certify that the installation work of my firm on this project:

- 8. [HAS] [HAS NOT] required the use of any ADHESIVES.
- 9. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
- 10. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
- 11. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY: (INSTALLER/MANUFACTURER/SUPPLIER FIRM)

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

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SECTION 01 73 00 - EXECUTION

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 general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Construction layout.
2. Field engineering.
3. Installation.
4. Cutting and patching.
 - a. Make the several parts fit properly.
 - b. Uncover work to provide for installation, inspection, or both of ill-timed work.
 - c. Remove and replace work non-conforming or defective work.
5. Coordination of Owner's portion of the Work.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

- B. Related Requirements:

1. Section 01 10 00 "Summary" for coordination of Owner-furnished products, and limits on use of Project site.
2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
4. Section 07 84 13 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 PREINSTALLATION MEETINGS

A. Cutting and Patching Conference: Conduct conference at Project site.

1. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Inform Architect of scheduled meeting. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:
 - a. Contractor's superintendent.
 - b. Trade supervisor responsible for cutting operations.
 - c. Trade supervisor(s) responsible for patching of each type of substrate.
 - d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affected by cutting and patching operations.
2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

B. Layout Conference: Conduct conference at Project site.

1. Prior to establishing layout of new perimeter and structural column grid(s), review building location requirements. Review benchmark, control point, and layout and dimension requirements. Inform Architect of scheduled meeting. Require representatives of each entity directly concerned with Project layout to attend, including the following:
 - a. Contractor's superintendent.
 - b. Professional engineer responsible for performing site survey serving as basis for Project design.
2. Review meanings and intent of dimensions, notes, terms, graphic symbols, and other layout information indicated on the Drawings.
3. Review requirements for including layouts on Shop Drawings and other submittals.
4. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certified Surveys: Submit two copies signed by land surveyor.

C. Certificates: Submit certificate signed by land surveyor, certifying that location and elevation of improvements comply with requirements.

D. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.

5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

- E. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.6 CLOSEOUT SUBMITTALS

- A. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.7 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Professional Engineer Qualifications: Refer to Section 01 40 00 "Quality Requirements."
- C. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or

decreased operational life or safety. Other construction elements include but are not limited to the following:

- a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.

2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to both local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect through Construction Manager in accordance with requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.
- B. Engage a land surveyor experienced in laying out the Work, using the following accepted surveying practices:
1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.

2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb, and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.6 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 01 10 00 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 COORDINATION OF OWNER'S PORTION OF THE WORK

- A. Site Access: Provide access to Project site for Owner's construction personnel.
1. Provide temporary facilities required for Owner-furnished, Owner-installed products.
 2. Refer to Section 01 10 00 "Summary" for other requirements for Owner-furnished, Owner-installed products.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, in accordance with regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.

- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces in accordance with written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 01 91 13 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF THE WORK

- A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Restore permanent facilities used during construction to their specified condition.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

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SECTION 01 74 19 –

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.1 SUMMARY

- A. The Work of this Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

- A. Alternative daily cover: Cover material other than earthen material placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging.
- B. CMU: Concrete masonry units.
- C. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- D. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- E. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- F. Extended Producer Responsibility: Closed-loop program, aka product take-back, are measures undertaken by a producer to accept its own and sometimes other manufacturers' products as post-consumer waste at the end of the product's useful life to recover and recycle the materials for use in new products of the same type.
- G. Material Stream: A material flow coming from a jobsite into markets for building materials including a specific material category that is diverted in a specific way or a mixture of several material categories that are diverted in a specific way.
- H. On site Waste Diversion: On site reuse including crushing asphalt, concrete, and masonry for infill or aggregate.
- I. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- J. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- K. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 7 days of date established for commencement of the Work. Plan must include the following:
 - 1. Strategies to reduce the generation of waste during Project design and construction.
 - 2. Waste diversion goals for Project, identifying the materials (both structural and nonstructural) targeted for recycling, reuse, or salvage and identifying the target diversion percentage (at least 50 percent).
 - 3. Where materials will be taken, including expected diversion rates for each material.

1.5 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use form approved by Architect and Owner Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons (tonnes).
 - 4. Quantity of waste salvaged, both estimated and actual in tons (tonnes).
 - 5. Quantity of waste recycled, both estimated and actual in tons (tonnes).
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Qualification Statements: For waste management coordinator and refrigerant recovery technician.

- H. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed in accordance with EPA regulations. Include name and address of technician and date refrigerant was recovered.
- I. Refrigerant Recovery: Comply with requirements in Section 02 41 19 "Selective Demolition" for refrigerant recovery submittals.

1.6 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.
- B. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation, and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.7 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan in accordance with requirements in this Section. Plan must include provisions for waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing, demolition and construction waste generated by the Work. Identify at least two kinds of materials that will be diverted from landfills or incineration. Include estimated quantities and assumptions for estimates. Specify the means and methods of diversion for each of the selected material streams.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work. Include on site reuse such as crushing asphalt, concrete, and masonry for infill or aggregate.
 - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials , including the following:

1. Demolition Waste:
 - a. Asphalt paving.
 - b. Concrete.
 - c. Concrete reinforcing steel.
 - d. Brick.
 - e. CMU.
 - f. Wood studs.
 - g. Wood joists.
 - h. Plywood and oriented strand board.
 - i. Wood paneling.
 - j. Wood trim.
 - k. Structural and miscellaneous steel.
 - l. Rough hardware.
 - m. Roofing.
 - n. Insulation.
 - o. Doors and frames.
 - p. Door hardware.
 - q. Windows.
 - r. Glazing.
 - s. Metal studs.
 - t. Gypsum board.
 - u. Acoustical tile and panels.
 - v. Carpet.
 - w. Carpet pad.
 - x. Demountable partitions.
 - y. Equipment.
 - z. Cabinets.
 - aa. Plumbing fixtures.

- bb. Piping.
 - cc. Supports and hangers.
 - dd. Valves.
 - ee. Sprinklers.
 - ff. Mechanical equipment.
 - gg. Refrigerants.
 - hh. Electrical conduit.
 - ii. Copper wiring.
 - jj. Lighting fixtures.
 - kk. Lamps.
 - ll. Ballasts.
 - mm. Electrical devices.
 - nn. Switchgear and panelboards.
 - oo. Transformers.
2. Construction Waste:
- a. Masonry and CMU.
 - b. Lumber.
 - c. Wood sheet materials.
 - d. Wood trim.
 - e. Metals.
 - f. Roofing.
 - g. Insulation.
 - h. Carpet and pad.
 - i. Gypsum board.
 - j. Piping.
 - k. Electrical conduit.
 - l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Wood pallets.
 - 8) Plastic pails.

PART 3 EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during entire duration of the Contract.
 - 1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator must be present at Project site full time for duration of Project.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
 - 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.
- E. Waste Management in Historic Zones or Areas: Transportation equipment and other materials are to be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, by 12 inches (300 mm) or more.

3.2 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials to be shared equally by Owner and Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials in accordance with recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to maximum extent practical in accordance with approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination, and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.3 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cutoffs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

C. Gypsum Board: Stack large clean pieces on wood pallets or in containers and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

D. Paint: Seal containers and store by type.

3.4 DISPOSAL OF WASTE

A. Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Unless otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner's property.

C. Burning:

1. Do not burn waste materials.

END OF SECTION 01 74 19

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SECTION 01 77 00 – CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final Completion procedures.
 - 3. List of incomplete items.
 - 4. Submittal of Project warranties.
 - 5. Final cleaning.
- B. Related Requirements:
 - 1. Section 01 29 00 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
 - 2. Section 01 32 33 "Photographic Documentation" for submitting Final Completion construction photographic documentation.
 - 3. Section 01 78 23 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 4. Section 01 78 39 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 5. Section 01 79 00 "Demonstration and Training" for requirements to train Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.2 DEFINITIONS

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest-control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
5. Submit testing, adjusting, and balancing records.
6. Submit sustainable design submittals not previously submitted.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
6. Advise Owner of changeover in utility services.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.

8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements.
10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:

1. Submit a final Application for Payment in accordance with Section 01 29 00 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list will state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.
5. Submit Final Completion photographic documentation.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
 - a. Project name.

- b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
4. Submit list of incomplete items in the following format:
- a. MS Excel Electronic File: Architect will return annotated file.
 - b. PDF Electronic File: Architect will return annotated file.
 - c. Three Paper Copies: Architect will return two copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 1. Submit on digital media acceptable to Architect.
- E. Warranties in Paper Form:
 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- F. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Clean flooring, removing debris, dirt, and staining; clean in accordance with manufacturer's instructions.
 - i. Vacuum and mop concrete.
 - j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean in accordance with manufacturer's instructions if visible soil or stains remain.
 - k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - l. Remove labels that are not permanent.
 - m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - p. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA ACR. Provide written report on completion of cleaning.
 - q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
 - r. Clean strainers.
 - s. Leave Project clean and ready for occupancy.

- C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste-disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."

3.2 CORRECTION OF THE WORK

- A. Complete repair and restoration operations required by "Correction of the Work" Article in Section 01 73 00 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 01 77 00

SECTION 01 78 23 -

OPERATION AND MAINTENANCE DATA

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 administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements
 - 1. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Section 01 91 13 "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect and Commissioning Authority will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.

2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.
 1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

PART 2 PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
 1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.

4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Architect.
 7. Name and contact information for Commissioning Authority.
 8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 9. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf or post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2 inch x 11 inch (215 mm x 280 mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 4. Supplementary Text: Prepared on 8-1/2 inch x 11 inch (215 mm x 280 mm) white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.

- b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.

9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.

5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 1. Standard maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.

2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 1. Include procedures to follow and required notifications for warranty claims.

PART 3 EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 1. Do not use original project record documents as part of operation and maintenance manuals.
 2. Comply with requirements of newly prepared record Drawings in Section 01 78 39 "Project Record Documents."
- G. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

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SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for final property survey.
 - 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
 - 3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints and one set(s) of file prints.
 - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit PDF electronic files of scanned Record Prints and three set(s) of file prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into Project Record Documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as for the original Contract Drawings.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 4. Refer instances of uncertainty to Architect for resolution.
 5. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 01 31 00 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

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

- B. Format: Submit record specifications as annotated PDF electronic file.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
- C. Format: Submit Record Product Data as annotated PDF electronic file.
 - 1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.7 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 78 39

SECTION 01 79 00 –

DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
 - 2. Demonstration and training video recordings.
- B. Allowances: Furnish demonstration and training instruction time under the demonstration and training allowance as specified in Section 01 21 00 "Allowances."
- C. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up. See requirements in Section 01 22 00 "Unit Prices."

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For instructor.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.

- f. Date of video recording.
2. Transcript:
 - a. Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
 - b. Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
 3. At completion of training, submit complete training manual(s) for Owner's use prepared in same PDF file format required for operation and maintenance manuals specified in Section 01 78 23 "Operation and Maintenance Data."

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 1. Inspect and discuss locations and other facilities required for instruction.
 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 3. Review required content of instruction.
 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.6 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project Record Documents.
 - f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.
 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.

- f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
- a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
- a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:
- a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

1.7 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.8 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.
- F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.9 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode.
 - 1. Submit video recordings on CD-ROM or thumb drive.
 - 2. File Hierarchy: Organize folder structure and file locations in accordance with Project Manual table of contents. Provide complete screen-based menu.
 - 3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.
 - 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Contractor involved on the Project, arranged in accordance with Project Manual table of contents:
 - a. Name of Contractor/Installer.
 - b. Business address.
 - c. Business phone number.

- d. Point of contact.
 - e. Email address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
- 1. Film training session(s) in segments not to exceed 15 minutes.
 - a. Produce segments to present a single significant piece of equipment per segment.
 - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
- 1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 79 00

SECTION 01 81 13.72 -

SUSTAINABLE DESIGN REQUIREMENTS - CALGREEN

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general requirements and procedures for compliance with and certification from 24 CCR 11 (hereafter, "CALGreen").
 - 1. Some CALGreen requirements depend on product selections and may not be specifically identified as CALGreen requirements. Compliance with CALGreen requirements may be used as one criterion to evaluate substitution requests and comparable product requests.

1.3 DEFINITIONS

- A. Composite Wood Products: Hardwood plywood, particleboard, and medium-density fiberboard. "Composite wood products" does not include hardboard or structural plywood.
- B. Low-Emitting and Fuel-Efficient Vehicles: Zero emission vehicle, including neighborhood electric vehicles, partial zero emission vehicle, advanced technology PZEV or CNG fueled (original equipment manufacturer only); regulated under California Code's Health and Safety Code, Section 43800, and under CCR, Title 13, Sections 1961 and 1962. And high-efficiency vehicles, regulated by the EPA, bearing High-Occupancy Vehicle (HOV) carpool lane stickers issued by the Department of Motor Vehicles.
- C. Recycled Content: Component of a material made of recycled materials. Recycled material can be derived from two sources: preconsumer, also known as "post-industrial," or postconsumer. Postconsumer recycled material refers to items that have been in the consumer market such as aluminum cans. Post-industrial material is waste generated from the original manufacturing process that is used again.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site. Review CALGreen requirements and action plans for compliance with requirements. Also reference Section 01 31 00 "Project Management and Coordination" for further information.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect about CALGreen requirements that depend on product selection or product qualities. Document responses as informational submittals.
- B. Submit documentation to enforcing agency for credits that are Contractor's responsibility, that depend on product selection or product qualities, or that depend on Contractor's procedures, until enforcing agency has made its determination on Project's CALGreen certification application.
 - 1. Document correspondence with review team, as assigned by the enforcing agency, as informational submittals.
- C. Environmental Management System: Document the following:

1. Environmental policy.
2. Regulatory compliance and training.
3. Environmental risk assessment that shows sensitive environmental areas and ranks potential risks that may arise from the construction.
4. Environmental risk management strategies.
5. Environmental management roles, responsibilities, and reporting structure for the construction phase.
6. Site and work instructions for site personnel outlining environmental procedures during construction.
7. Environmental inspection checklists.
8. Records of compliance.

1.6 ACTION SUBMITTALS

- A. General: Submit additional sustainable design submittals required by other Sections.
- B. Sustainable design submittals are in addition to other submittals.
 1. If submitted item is identical to that submitted to comply with other requirements, include an additional copy with other submittal as a record copy of compliance with indicated CALGreen requirements instead of separate sustainable design submittal. Mark additional copy "Sustainable design submittal."
- C. Sustainable Design Documentation Submittals:
 1. Stormwater Pollution Prevention Plan.
 2. Product Data for irrigation systems components including, but not limited to, the following:
 - a. Sprinkler Heads: Indicate degree of head rotation and spray characteristics/pattern.
 - b. Controllers and sensors.
 3. Product Data and schedules for plumbing fixtures and fittings. Include rated capacities and WaterSense certification where applicable.
 4. Product Data for appliances.
 5. Environmental management system documents.
 6. Lighting controls.
 7. Environmental product declarations.
 8. Third-party certifications based on multiple attribute standards.
 9. Third-party-certified life-cycle product assessments.
 10. Product Data, manufacturer's certifications, chain-of-custody certification, or other documentation acceptable to authorities having jurisdiction; for products containing composite wood or agrifiber products or wood glues, indicate compliance with CARB's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products."
 11. Construction Waste Management Plan complying with Section 01 74 19 "Construction Waste Management and Disposal."
 12. Product Data and laboratory test reports for adhesives and sealants indicating VOC content and compliance with requirements for low-emitting materials.
 13. Certificates for carpet and undercarpet adhesives indicating compliance with CRI's Green Label Plus testing program.

14. Product Data and laboratory test reports for paints and coatings indicating VOC content and compliance with requirements for low-emitting materials.
15. Laboratory test reports for hard flooring, insulation, acoustical ceilings, and wall coverings, indicating compliance with requirements for low-emitting materials, as defined in this Section.
16. Indoor-Air-Quality (IAQ) testing report from testing and inspecting agency indicating results of IAQ testing and documentation that show compliance with IAQ testing procedures and requirements.

1.7 INFORMATIONAL SUBMITTALS

- A. Project Materials Cost Data: Provide statement indicating total cost for materials used for Project. Costs exclude labor, overhead, and profit. Include breakout of costs for the following categories of items:
 1. Plumbing.
 2. Mechanical.
 3. Electrical.
 4. Specialty items such as elevators and equipment.
 5. Wood-based construction materials.
- B. Sustainable Design Action Plans: Submit preliminary submittals within seven days of date established for the Notice to Proceed, indicating how the following requirements will be met:
 1. CALGreen checklist for mandatory measures.
 2. CALGreen Tier 1 checklist as required.
 3. List of proposed products with environmental product declarations.
 4. List of proposed products complying with requirements for multiple attribute standards.
 5. List of proposed products complying with requirements for life-cycle product assessments.
 6. Environmental policy.
 7. Waste management plan complying with Section 01 74 19 "Construction Waste Management and Disposal."
 8. Construction IAQ management plan.
- C. Sustainable Design Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with sustainable design action plans.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Provide products and procedures necessary to comply with CALGreen requirements referenced in this Section. Although other Sections may specify some requirements that contribute to referenced CALGreen requirements, Contractor will determine additional materials and procedures necessary to comply with CALGreen requirements indicated.

2.2 LOW-EMITTING MATERIALS

- A. Adhesives and Sealants:
 1. For field applications inside the building, adhesives and sealants to comply with the following VOC content limits:

- a. Wood Glues: 30 g/L.
 - b. Metal-to-Metal Adhesives: 30 g/L.
 - c. Adhesives for Porous Materials (except Wood): 50 g/L.
 - d. Subfloor Adhesives: 50 g/L.
 - e. Plastic Foam Adhesives: 50 g/L.
 - f. Cove Base Adhesives: 50 g/L.
 - g. Gypsum Board and Panel Adhesives: 50 g/L.
 - h. Multipurpose Construction Adhesives: 70 g/L.
 - i. Fiberglass Adhesives: 80 g/L.
 - j. Contact Adhesive: 80 g/L.
 - k. Structural Glazing Adhesives: 100 g/L.
 - l. Wood Flooring Adhesive: 100 g/L.
 - m. Single-Ply Roof Membrane Adhesive: 250 g/L.
 - n. ABS Welding Compounds: 325 g/L.
 - o. CPVC Welding Compounds: 490 g/L.
 - p. PVC Welding Compounds: 510 g/L.
 - q. Adhesive Primer for Plastic: 550 g/L.
 - r. Architectural Sealants: 250 g/L.
 - s. Nonmembrane Roof Sealants: 300 g/L.
 - t. Other Sealants: 420 g/L.
2. For field applications inside the building, adhesives and sealants must comply with the requirements of SCAQMD Rule 1168 or local code when tested in accordance with the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Paints: For field applications inside the building, wall paints must meet local code requirements when tested in accordance with the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Thermal Insulation: Provide insulation complying with Tier 1 requirements.
- D. Ceiling and Wall Panels: Acoustical ceiling and wall cladding products must comply with the VOC-emissions limits defined in the CHPS criteria and be listed in the Preapproved Products Database, High Performance Products subset or have a GREENGUARD Gold certification.

PART 3 EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

- A. CALGreen requires use of a Construction Waste Management Plan outlining how waste will be divided on the construction site, as well as how often it will be hauled to a landfill or recycling center and by whom.
- B. CALGreen includes a sample plan outlining all specific requirements of the plan.
- C. Comply with Section 01 74 19 "Construction Waste Management and Disposal."

3.2 COMMISSIONING

- A. CALGreen requires commissioning of the building mechanical and electrical systems to ensure proper installation and optimized performance as the building starts to be occupied. A systematic quality-assurance process that spans the entire design and construction process, including verifying and documenting that building systems and components are planned, designed, installed, tested, operated, and maintained to meet Owner's Project requirements.
- B. Comply with Section 01 91 13 "General Commissioning Requirements" and Section 01 91 19.43 "Exterior Enclosure Commissioning."

3.3 INDOOR-AIR-QUALITY (IAQ) ASSESSMENT

- A. Air-Quality Testing: Owner will engage a qualified testing agency to perform the following:
 - 1. Conduct baseline IAQ testing, after construction ends and prior to occupancy, in accordance with the EPA's "Testing for Indoor Air Quality - Section 01 81 09."
 - 2. Indoor air to comply with standards and limits in the EPA's "Testing for Indoor Air Quality - Section 01 81 09."
 - a. Carbon monoxide maximum is 9 ppm, not to exceed outdoor levels by 2 ppm.
 - b. Formaldehyde maximum is 27 ppb.
 - c. Particulates (PM10) maximum is 50 micrograms per cubic meter.
 - d. 4-Phenylcycohexene (4-PCH) maximum is 6.5 micrograms per cubic meter.
 - e. TVOC maximum is 300 micrograms per cubic meter.
 - 3. For each sampling point where the maximum concentration limits are exceeded, take corrective action until requirements have been met.
 - 4. For each sampling point where the airborne mold and mildew indoor species distribution varies by more than 10 percent from exterior sampling specification, identify the source of mold and mildew and remediate with corrective action, then retest until compliant results are attained.
 - 5. If noncompliant test results occur, provide a written report describing the source(s) of the noncompliant condition(s) and the corrective action(s) implemented.

END OF SECTION 01 81 13.72

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SECTION 01 91 13 -

GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Owner's Project Requirements and Basis-of-Design Document are included by reference for information only.

1.2 SUMMARY

- A. Section Includes:
 - 1. General requirements for coordinating and scheduling commissioning activities.
 - 2. Commissioning meetings.
 - 3. Commissioning reports.
 - 4. Use of commissioning process test equipment, instrumentation, and tools.
 - 5. Construction checklists, including, but not limited to, installation checks, startup, performance tests, and performance test demonstration.
 - 6. Commissioning tests and commissioning test demonstration.
 - 7. Adjusting, verifying, and documenting identified systems and assemblies.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for Commissioning Authority responsibilities.
 - 2. Section 01 33 00 "Submittal Procedures" for submittal procedure requirements for commissioning process.
 - 3. Section 01 77 00 "Closeout Procedures" for Certificate of Construction-Phase Commissioning Process Completion submittal requirements.
 - 4. Section 01 78 23 "Operation and Maintenance Data" for preliminary operation and maintenance data submittal requirements.

1.3 ALLOWANCES

- A. Labor and management costs for the performance of commissioning process.
- B. The following are excluded from the commissioning allowance:
 - 1. Equipment and systems installation, startup, and field quality-control testing indicated in the Contract Documents.
 - 2. Test equipment, instrumentation, and tools (including, but not limited to, proprietary test equipment, instrumentation, and tools) required to perform tests.
 - 3. Work to correct commissioning issues.
 - 4. Work to repeat tests when equipment and systems fail acceptance criteria.

1.4 UNIT PRICES

- A. Commissioning allowance may be adjusted up or down by the "List of Unit Prices" Article in Section 01 22 00 "Unit Prices" when actual labor hours are computed at the end of commissioning process. See Section 01 21 00 "Allowances" for commissioning allowance.
- B. The following are excluded from the computation for the adjustment of the commissioning allowance for technician labor hours:
 - 1. Work to correct commissioning issues.
 - 2. Work to repeat tests when equipment and systems fail acceptance criteria.

1.5 DEFINITIONS

- A. Acceptance Criteria: Threshold of acceptable work quality or performance specified for a commissioning activity, including, but not limited to, construction checklists, performance tests, performance test demonstrations, commissioning tests, and commissioning test demonstrations.
- B. Basis-of-Design Document: A document prepared by Architect that records concepts, calculations, decisions, and product selections used to comply with Owner's Project Requirements and to suit applicable regulatory requirements, standards, and guidelines.
- C. Commissioning Authority: An entity engaged by Owner, and identified in Section 01 10 00 "Summary," to evaluate Commissioning-Process Work.
- D. Commissioning Plan: A document, prepared by Commissioning Authority, that outlines the organization, schedule, allocation of resources, and documentation of commissioning requirements.
- E. Commissioning: A quality-focused process for verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, and tested to comply with Owner's Project Requirements. The requirements specified here are limited to the construction phase commissioning activities. The scope of the commissioning process is defined in Section 01 10 00 "Summary."
- F. Construction-Phase Commissioning-Process Completion: The stage of completion and acceptance of commissioning process when resolution of deficient conditions and issues discovered during commissioning process and retesting until acceptable results are obtained has been accomplished. Owner will establish in writing the date construction-phase commissioning-process completion is achieved. See Section 01 77 00 "Closeout Procedures" for Certificate of Construction-Phase Commissioning Process Completion submittal requirements.
 - 1. Commissioning process is complete when the Work specified of this Section and related Sections has been completed and accepted, including, but not limited to, the following:
 - a. Completion of tests and acceptance of test results.
 - b. Resolution of issues, as verified by retests performed and documented with acceptance of retest results.
 - c. Comply with requirements in Section 01 79 00 "Demonstration and Training."
 - d. Completion and acceptance of submittals and reports.
- G. Owner's Project Requirements: A document that details the functional requirements of a project and the expectations of how it will be used and operated, including Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information. This document is prepared either by the Owner or for the Owner by the Architect or Commissioning Authority.

- H. Owner's Witness: Commissioning Authority, Owner's Project Manager, or Architect-designated witness authorized to authenticate test demonstration data and to sign completed test data forms.
- I. "Systems," "Assemblies," "Subsystems," "Equipment," and "Components": Where these terms are used together or separately, they shall mean "as-built" systems, assemblies, subsystems, equipment, and components.
- J. Test: Performance tests, performance test demonstrations, commissioning tests, and commissioning test demonstrations.
- K. Sampling Procedures and Tables for Inspection by Attributes: As defined in ASQ Z1.4.

1.6 COMPENSATION

- A. If Architect, Commissioning Authority, other Owner's witness, or Owner's staff perform additional services or incur additional expenses due to actions of Contractor listed below, compensate Owner for such additional services and expenses.
 - 1. Failure to provide timely notice of commissioning activities schedule changes.
 - 2. Failure to meet acceptance criteria for test demonstrations.
- B. Contractor shall compensate Owner for such additional services and expenses at the rate of applicable billings rate plus cost of round trip for personnel travelling more than 200 miles, plus per diem allowances for meals and lodging according to current U.S. General Services Administration (GSA) Per Diem Rates.

1.7 COMMISSIONING TEAM

- A. Members Appointed by Contractor(s):
 - 1. Commissioning Coordinator: A person or entity employed by Contractor to manage, schedule, and coordinate commissioning process.
 - 2. Project superintendent and other employees that Contractor may deem appropriate for a particular portion of the commissioning process.
 - 3. Subcontractors, installers, suppliers, and specialists that Contractor may deem appropriate for a particular portion of the commissioning process.
 - 4. Appointed team members shall have the authority to act on behalf of the entity they represent.
- B. Members Appointed by Owner:
 - 1. Commissioning Authority, plus consultants that Commissioning Authority may deem appropriate for a particular portion of the commissioning process.
 - 2. Owner representative(s), facility operations and maintenance personnel, plus other employees, separate contractors, and consultants that Owner may deem appropriate for a particular portion of the commissioning process.
 - 3. Architect, plus employees and consultants that Architect may deem appropriate for a particular portion of the commissioning process.

1.8 INFORMATIONAL SUBMITTALS

- A. Comply with requirements in Section 01 33 00 "Submittal Procedures" for submittal procedure general requirements for commissioning process.
- B. Commissioning Plan Information:

1. List of Contractor-appointed commissioning team members to include specific personnel and subcontractors performing the various commissioning requirements.
 2. Schedule of commissioning activities, integrated with the Construction Schedule. Comply with requirements in Section 01 32 00 "Construction Progress Documentation" for the Construction Schedule general requirements for commissioning process.
 3. Contractor personnel and subcontractors participating in each test.
 4. List of instrumentation required for each test to include identification of parties that will provide instrumentation for each test.
- C. Commissioning schedule.
- D. Two-week look-ahead schedules.
- E. Commissioning Coordinator Letter of Authority:
1. Within 10 days after approval of Commissioning Coordinator qualifications, submit a letter of authority for Commissioning Coordinator, signed by a principal of Contractor's firm. Letter shall authorize Commissioning Coordinator to do the following:
 - a. Make inspections required for commissioning process.
 - b. Coordinate, schedule, and manage commissioning process of Contractor, subcontractors, and suppliers.
 - c. Obtain documentation required for commissioning process from Contractor, subcontractors, and suppliers.
 - d. Report issues, delayed resolution of issues, schedule conflicts, and lack of cooperation or expertise on the part of members of the commissioning team.
- F. Commissioning Coordinator Qualification Data: For entity coordinating Contractor's commissioning activities to demonstrate their capabilities and experience.
1. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- G. List test instrumentation, equipment, and monitoring devices. Include the following information:
1. Make, model, serial number, and application for each instrument, equipment, and monitoring device.
 2. Brief description of intended use.
 3. Calibration record showing the following:
 - a. Calibration agency, including name and contact information.
 - b. Last date of calibration.
 - c. Range of values for which calibration is valid.
 - d. Certification of accuracy.
 - e. Certification for calibration equipment traceable to NIST.
 - f. Due date of the next calibration.
- H. Test Reports:
1. Pre-Startup Report: Prior to startup of equipment or a system, submit signed, completed construction checklists.

2. Test Data Reports: At the end of each day in which tests are conducted, submit test data for tests performed.
3. Commissioning Issue Reports: Daily, at the end of each day in which tests are conducted, submit commissioning issue reports for tests for which acceptable results were not achieved.
4. Weekly Progress Report: Weekly, at the end of each week in which tests are conducted, submit a progress report.
5. Data Trend Logs: Submit data trend logs at the end of the trend log period.
6. System Alarm Logs: Daily, at the start of days following a day in which tests were performed, submit printout of log of alarms that occurred since the last log was printed.

I. Construction Checklists:

1. Material checks.
2. Installation checks.
3. Startup procedures, where required.

1.9 CLOSEOUT SUBMITTALS

A. Commissioning Report:

1. At Construction-Phase Commissioning Completion, include the following:
 - a. Pre-startup reports.
 - b. Approved test procedures.
 - c. Test data forms, completed and signed.
 - d. Progress reports.
 - e. Commissioning issue report log.
 - f. Commissioning issue reports showing resolution of issues.
 - g. Correspondence or other documents related to resolution of issues.
 - h. Other reports required by commissioning process.
 - i. List unresolved issues and reasons they remain unresolved and should be exempted from the requirements for Construction-Phase Commissioning Completion.
 - j. Report shall include commissioning work of Contractor.

B. Request for Certificate of Construction-Phase Commissioning Process Completion.

C. Operation and Maintenance Data: For proprietary test equipment, instrumentation, and tools to include in operation and maintenance manuals.

1.10 QUALITY ASSURANCE

A. Commissioning Coordinator Qualifications:

1. Documented experience commissioning systems of similar complexity to those contained in these documents on at least three projects of similar scope and complexity.
2. Certification of commissioning-process expertise. The following certifications are acceptable. Owner reserves the right to accept or reject certifications as evidence of qualification.
 - a. Certified Commissioning Authority, by AABC Commissioning Group (ACG).
 - b. Commissioning-Process Management Professional, by American Society of Heating, Refrigerating and Air-Conditioning Engineers.

- c. Certified Commissioning Professional, by Building Commissioning Association.
 - d. Accredited Commissioning-Process Authority Professional, by University of Wisconsin.
 - e. Accredited Commissioning-Process Manager, by University of Wisconsin.
 - f. Accredited Green Commissioning-Process Provider, by University of Wisconsin.
- B. Calibration Agency Qualifications: Certified by The American Association for Laboratory Accreditation that the calibration agency complies with minimum requirements of ISO/IEC 17025.

PART 2 PRODUCTS

2.1 TEST EQUIPMENT, INSTRUMENTATION, AND TOOLS

- A. Test equipment and instrumentation required to perform the commissioning process shall remain the property of Contractor unless otherwise indicated.
- B. Test equipment and instrumentation required to perform commissioning process shall comply with the following criteria:
 - 1. Be manufactured for the purpose of testing and measuring tests for which they are being used and have an accuracy to test and measure system performance within the tolerances required to determine acceptable performance.
 - 2. Calibrated and certified.
 - a. Calibration performed and documented by a qualified calibration agency according to national standards applicable to the tools and instrumentation being calibrated. Calibration shall be current according to national standards or within test equipment and instrumentation manufacturer's recommended intervals, whichever is more frequent, but not less than within six months of initial use on Project. Calibration tags shall be permanently affixed.
 - b. Repair and recalibrate test equipment and instrumentation if dismantled, dropped, or damaged since last calibrated.
 - 3. Maintain test equipment and instrumentation.
 - 4. Use test equipment and instrumentation only for testing or monitoring Work for which they are designed.

2.2 PROPRIETARY TEST EQUIPMENT, INSTRUMENTATION, AND TOOLS

- A. Proprietary test equipment, instrumentation, and tools are those manufactured or prescribed by tested equipment manufacturer and required for work on its equipment as a condition of equipment warranty, or as otherwise required to service, repair, adjust, calibrate, or perform work on its equipment.
 - 1. Identify proprietary test equipment, instrumentation, and tools required in the test equipment identification list submittal.
 - 2. Proprietary test equipment, instrumentation, and tools shall become the property of Owner at Substantial Completion.

2.3 REPORT FORMAT AND ORGANIZATION

- A. General Format and Organization:
 - 1. Bind report in three-ring binders.
 - 2. Label the front cover and spine of each binder with the report title, volume number, project name, Contractor's name, and date of report.

3. Electronic Data: Portable document format (PDF); a single file with outline-organized bookmarks for major and minor tabs and tab contents itemized for specific reports.

B. Commissioning Report:

1. Include a table of contents and an index to each test.
2. Include major tabs for each Specification Section.
3. Include minor tabs for each test.
4. Within each minor tab, include the following:
 - a. Test specification.
 - b. Pre-startup reports.
 - c. Approved test procedures.
 - d. Test data forms, completed and signed.
 - e. Commissioning issue reports, showing resolution of issues, and documentation related to resolution of issues pertaining to a single test. Group data forms, commissioning issue reports showing resolution of issues, and documentation related to resolution of issues for each test repetition together within the minor tab, in reverse chronological order (most recent on top).

PART 3 EXECUTION

3.1 PREPARATION

- A. Review preliminary construction checklists and preliminary test procedures and data forms.

3.2 CONSTRUCTION CHECKLISTS

- A. Construction checklists cannot modify or conflict with the Contract Documents.
- B. Create construction checklists based on actual systems and equipment to be included in Project.
- C. Material Checks: Compare specified characteristics and approved submittals with materials as received. Include factory tests and other evaluations, adjustments, and tests performed prior to shipment if applicable.
 1. Service connection requirements, including configuration, size, location, and other pertinent characteristics.
 2. Included optional features.
 3. Delivery Receipt Check: Inspect and record physical condition of materials and equipment on delivery to Project site, including agreement with approved submittals, cleanliness, and lack of damage.
 4. Installation Checks:
 - a. Location according to Drawings and approved Shop Drawings.
 - b. Configuration.
 - c. Compliance with manufacturers' written installation instructions.
 - d. Attachment to structure.
 - e. Access clearance to allow for maintenance, service, repair, removal, and replacement without the need to disassemble or remove other equipment or building elements. Access coordinated with other building elements and equipment, including, but not

limited to, ceiling and wall access panels, in a manner consistent with OSHA fall-protection regulations and safe work practices.

- f. Utility connections are of the correct characteristics, as applicable.
- g. Correct labeling and identification.
- h. Startup Checks: Verify readiness of equipment to be energized. Include manufacturer's standard startup procedures and forms.

D. Startup: Perform and document initial operation of equipment to prove that it is installed properly and operates as intended according to manufacturer's standard startup procedures, at minimum.

E. Performance Tests:

- 1. Static Tests: As specified elsewhere, including, but not limited to, duct and pipe leakage tests, insulation-resistance tests, and water-penetration tests.
- 2. Component Performance Tests: Tests evaluate the performance of an input or output of components under a full range of operating conditions.
- 3. Equipment and Assembly Performance Tests: Test and evaluate performance of equipment and assemblies under a full range of operating conditions and loads.
- 4. System Performance Tests: Test and evaluate performance of systems under a full range of operating conditions and loads.
- 5. Intersystem Performance Tests: Test and evaluate the interface of different systems under a full range of operating conditions and loads.

F. Deferred Construction Checklists: Obtain Owner approval of proposed deferral of construction checklists, including proposed schedule of completion of each deferred construction checklist, before submitting request for Certificate of Construction-Phase Commissioning Process Completion. When approved, deferred construction checklists may be completed after date of Construction-Phase Commissioning Completion. Include the following in a request for Certificate of Construction-Phase Commissioning Process Completion:

- 1. Identify deferred construction checklists by number and title.
- 2. Provide a target schedule for completion of deferred construction checklists.
- 3. Written approval of proposed deferred construction checklists, including approved schedule of completion of each deferred construction checklist.

G. Delayed Construction Checklists: Obtain Owner approval of proposed delayed construction checklists, including proposed schedule of completion of each delayed construction checklist, before submitting request for Certificate of Construction-Phase Commissioning Process Completion. When approved, delayed construction checklists may be completed after date of Construction-Phase Commissioning Completion. Include the following in a request for Certificate of Construction-Phase Commissioning Process Completion:

- 1. Identify delayed construction checklist by construction checklist number and title.
- 2. Provide a target schedule for completion of delayed construction checklists.
- 3. Written approval of proposed delayed construction checklists, including approved schedule of completion of each delayed construction checklist.

3.3 GENERAL EXECUTION REQUIREMENTS

A. Schedule and coordinate commissioning process with the Construction Schedule.

B. Perform activities identified in construction checklists, including tests, and document results of actions as construction proceeds.

- C. Perform test demonstrations for Owner's witness. Unless otherwise indicated, demonstrate tests for 100 percent of work to which the test applies. In some instances, demonstration of a random sample of other than 100 percent of the results of a test is specified.
 - 1. Where sampling is specified, the sampling plan and procedure for the test demonstration shall be determined using ASQ Z1.4.
 - a. General Inspection: Level I.
 - b. Special Inspection: Level S-1.
 - c. Acceptance Quality Limit (AQL) of 1.5.
 - 2. The "lot size" in ASQ Z1.4 is the sum of the number of items to which the test demonstration applies, as described in the scope subparagraph of each test.
 - 3. On determination of the sample size, the samples shall be selected randomly by Owner's witness at the time of the test demonstration.
 - 4. Include in the Commissioning Plan a detailed list of the test demonstrations with lot and sample quantities for each test.
- D. Report test data and commissioning issue resolutions.
- E. Schedule personnel to participate in and perform Commissioning-Process Work.
- F. Installing contractors' commissioning responsibilities include, but are not limited to, the following:
 - 1. Operating the equipment and systems they install during tests.
 - 2. In addition, installing contractors may be required to assist in tests of equipment and systems with which their work interfaces.

3.4 COMMISSIONING COORDINATOR RESPONSIBILITIES

- A. Management and Coordination: Manage, schedule, and coordinate commissioning process, including, but not limited to, the following:
 - 1. Coordinate with subcontractors on their commissioning responsibilities and activities.
 - 2. Obtain, assemble, and submit commissioning documentation.
 - 3. Conduct periodic on-site commissioning meetings. Comply with requirements in Section 01 31 00 "Project Management and Coordination."
 - 4. Develop and maintain the commissioning schedule. Integrate commissioning schedule into the Construction Schedule. Update Construction Schedule at specified intervals.
 - 5. Review and comment on preliminary test procedures and data forms.
 - 6. Report inconsistencies and issues in system operations.
 - 7. Verify that tests have been completed and results comply with acceptance criteria, and that equipment and systems are ready before scheduling test demonstrations.
 - 8. Direct and coordinate test demonstrations.
 - 9. Coordinate witnessing of test demonstrations by Owner's witness.
 - 10. Coordinate and manage training. Be present during training sessions to direct video recording, present training, and direct the training presentations of others. Comply with requirements in Section 01 79 00 "Demonstration and Training."
 - 11. Prepare and submit specified commissioning reports.
 - 12. Track commissioning issues until resolution and retesting is successfully completed.

13. Retain original records of Commissioning-Process Work, organized as required for the commissioning report. Provide Owner's representative access to these records on request.
14. Assemble and submit commissioning report.

3.5 COMMISSIONING TESTING

- A. Quality Control: Construction checklists, including tests, are quality-control tools designed to improve the functional quality of Project. Test demonstrations evaluate the effectiveness of Contractor's quality-control process.
- B. Owner's witness will be present to witness commissioning work requiring the signature of an owner's witness, including, but not limited to, test demonstrations. Owner's project manager will coordinate attendance by Owner's witness with Contractor's published Commissioning Schedule. Owner's witness will provide no labor or materials in the commissioning work. The only function of Owner's witness will be to observe and comment on the progress and results of commissioning process.
- C. Construction Checklists:
 1. Complete construction checklists as Work is completed.
 2. Distribute construction checklists to installing contractors before they start work.
 3. Installers:
 - a. Verify installation using approved construction checklists as Work proceeds.
 - b. Complete and sign construction checklists daily for work performed during the preceding day.
 4. Provide Commissioning Authority access to construction checklists.
- D. Installation Compliance Issues: Record as an installation compliance issue Work found to be incomplete, inaccessible, at variance with the Contract Documents, nonfunctional, or that does not comply with construction checklists. Record installation compliance issues on the construction checklist at the time they are identified. Record corrective action and how future Work should be modified before signing off the construction checklist.
- E. Pre-Startup Audit: Prior to executing startup procedures, review completed installation checks to determine readiness for startup and operation. Report conditions, which, if left uncorrected, adversely impact the ability of systems or equipment to operate satisfactorily or to comply with acceptance criteria. Prepare pre-startup report for each system.
- F. Test Procedures and Test Data Forms:
 1. Test procedures shall define the step-by-step procedures to be used to execute tests and test demonstrations.
 2. Test procedures shall be specific to the make, model, and application of the equipment and systems being tested.
 3. Completed test data forms are the official records of the test results.
 4. Commissioning Authority will provide to Contractor preliminary test procedures and test data forms for performance tests and commissioning tests after approval of Product Data, Shop Drawings, and preliminary operation and maintenance manual.
 5. Review preliminary test procedures and test data forms, and provide comments within 14 days of receipt from Commissioning Authority. Review shall address the following:
 - a. Equipment protection and warranty issues, including, but not limited to, manufacturers' installation and startup recommendations, and operation and maintenance instructions.

permanently installed in this work shall not be used to create the false load without Architect's written approval.

I. Deferred Tests:

1. Deferred Test List: Identify, in the request for Certificate of Construction-Phase Commissioning Process Completion, proposed deferred tests or other tests approved for deferral until specified seasonal or other conditions are available. When approved, deferred tests may be completed after the date of Construction-Phase Commissioning Completion. Identify proposed deferred tests in the request for Certificate of Construction-Phase Commissioning Process Completion as follows:
 - a. Identify deferred tests by number and title.
 - b. Provide a target schedule for completion of deferred tests.
2. Schedule and coordinate deferred tests. Schedule deferred tests when specified conditions are available. Notify Architect and Commissioning Authority at least three working days (minimum) in advance of tests.
3. Where deferred tests are specified, coordinate participation of necessary personnel and of Architect, Commissioning Authority, and Owner's witness. Schedule deferred tests to minimize occupant and facility impact. Obtain Architect's approval of the proposed schedule.

J. Delayed Tests:

1. Delayed Test List: Identify, in the request for Certificate of Construction-Phase Commissioning Process Completion, proposed delayed tests. Obtain Owner approval of proposed delayed tests, including proposed schedule of completion of each delayed test, before submitting request for Certificate of Construction-Phase Commissioning Process Completion. Include the following in the request for Certificate of Construction-Phase Commissioning Process Completion:
 - a. Identify delayed tests by test number and title.
 - b. Written approval of proposed delayed tests, including approved schedule of completion of delayed tests.
2. Schedule and coordinate delayed tests. Schedule delayed tests when conditions that caused the delay have been rectified. Notify Architect and Commissioning Authority at least three working days (minimum) in advance of tests.
3. Where delayed tests are approved, coordinate participation of necessary personnel and of Architect, Commissioning Authority, and Owner's witness. Schedule delayed tests to minimize occupant and facility impact. Obtain Architect's approval of the proposed schedule.

K. Commissioning Compliance Issues:

1. Test results that are not within the range of acceptable results are commissioning compliance issues.
2. Track and report commissioning compliance issues until resolution and retesting are successfully completed.
3. If a test demonstration fails, determine the cause of failure. Direct timely resolution of issue and then repeat the demonstration. If a test demonstration must be repeated due to failure caused by Contractor work or materials, reimburse Owner for billed costs for the participation in the repeated demonstration.
4. Test Results: If a test demonstration fails to meet the acceptance criteria, perform the following:

- a. Complete a commissioning compliance issue report form promptly on discovery of test results that do not comply with acceptance criteria.
 - b. Submit commissioning compliance issue report form within 24 hours of the test.
 - c. Determine the cause of the failure.
 - d. Establish responsibility for corrective action if the failure is due to conditions found to be Contractor's responsibility.
5. Commissioning Compliance Issue Report: Provide a commissioning compliance issue report for each issue. Do not report multiple issues on the same commissioning compliance issue report.
- a. Exception: If an entire class of devices is determined to exhibit the identical issue, they may be reported on a single commissioning compliance issue report. (For example, if all return-air damper actuators that are specified to fail to the open position are found to fail to the closed position, they may be reported on a single commissioning issue report. If a single commissioning issue report is used for multiple commissioning compliance issues, each device shall be identified in the report, and the total number of devices at issue shall be identified.
 - b. Complete and submit Part 1 of the commissioning compliance issue report immediately when the condition is observed.
 - c. Record the commissioning compliance issue report number and describe the deficient condition on the data form.
 - d. Resolve commissioning compliance issues promptly. Complete and submit Part 2 of the commissioning compliance issue report when issues are resolved.
6. Diagnose and correct failed test demonstrations as follows:
- a. Perform diagnostic tests and activities required to determine the fundamental cause of issues observed.
 - b. Record each step of the diagnostic procedure prior to performing the procedure. Update written procedure as changes become necessary.
 - c. Record the results of each step of the diagnostic procedure.
 - d. Record the conclusion of the diagnostic procedure on the fundamental cause of the issue.
 - e. Determine and record corrective measures.
 - f. Include diagnosis of fundamental cause of issues in commissioning compliance issue report.
7. Retest:
- a. Schedule and repeat the complete test procedure for each test demonstration for which acceptable results are not achieved. Obtain signature of Owner's witness on retest data forms. Repeat test demonstration until acceptable results are achieved. Except for issues that are determined to result from design errors or omissions, or other conditions beyond Contractor's responsibility, compensate Owner for direct costs incurred as the result of repeated test demonstrations to achieve acceptable results.
 - b. For each repeated test demonstration, submit a new test data form, marked "Retest."
8. Do not correct commissioning compliance issues during test demonstrations.
- a. Exceptions will be allowed if the cause of the issue is obvious and resolution can be completed in less than five minutes. If corrections are made under this exception, note the deficient conditions on the test data form and issue a commissioning compliance

issue report. A new test data form, marked "Retest," shall be initiated after the resolution has been completed.

3.6 COMMISSIONING MEETINGS

- A. Commissioning Authority will schedule and conduct commissioning meetings. Comply with requirements in Section 01 31 00 "Project Management and Coordination."

3.7 SEQUENCING

- A. Sequencing of Commissioning Verification Activities: For a particular material, item of equipment, assembly, or system, perform the following in the order listed unless otherwise indicated:

- 1. Construction Checklists:

- a. Material checks.
- b. Installation checks.
- c. Startup, as appropriate. Some startup may depend on component performance. Such startup may follow component performance tests on which the startup depends.
- d. Performance Tests:
 - 1) Static tests, as appropriate.
 - 2) Component performance tests. Some component performance tests may depend on completion of startup. Such component performance tests may follow startup.
 - 3) Equipment and assembly performance tests.
 - 4) System performance tests.
 - 5) Intersystem performance tests.

- 2. Commissioning tests.

- B. Before performing commissioning tests, verify that materials, equipment, assemblies, and systems are delivered, installed, started, and adjusted to perform according to construction checklists.
- C. Verify readiness of materials, equipment, assemblies, and systems by performing tests prior to performing test demonstrations. Notify Architect if acceptable results cannot be achieved due to conditions beyond Contractor's control or responsibility.
- D. Commence tests as soon as installation checks for materials, equipment, assemblies, or systems are satisfactorily completed. Tests of a particular system may proceed prior to completion of other systems, provided the incomplete work does not interfere with successful execution of test.

3.8 SCHEDULING

- A. Commence commissioning process as early in the construction period as possible.
- B. Commissioning Schedule: Integrate commissioning activities into Construction Schedule. See Section 01 32 00 "Construction Progress Documentation."
 - 1. Include detailed commissioning activities in monthly updated Construction Schedule and short-interval schedule submittals.
 - 2. Schedule the start date and duration for the following commissioning activities:
 - a. Submittals.
 - b. Preliminary operation and maintenance manual submittals.

- c. Installation checks.
 - d. Startup, where required.
 - e. Performance tests.
 - f. Performance test demonstrations.
 - g. Commissioning tests.
 - h. Commissioning test demonstrations.
3. Schedule shall include a line item for each installation check, startup, and test activity specific to the equipment or systems involved.
 4. Determine milestones and prerequisites for commissioning process. Show commissioning milestones, prerequisites, and dependencies in monthly updated critical-path-method construction schedule and short-interval schedule submittals.

C. Two-Week Look-Ahead Commissioning Schedule:

1. Two weeks prior to the beginning of tests, submit a detailed two-week look-ahead schedule. Thereafter, submit updated two-week look-ahead schedules weekly for the duration of commissioning process.
2. Two-week look-ahead schedules shall identify the date, time, beginning location, Contractor personnel required, and anticipated duration for each startup or test activity.
3. Use two-week look-ahead schedules to notify and coordinate participation of Owner's witnesses.

D. Owner's Witness Coordination:

1. Coordinate Owner's witness participation via Architect.
2. Notify Architect of commissioning schedule changes at least two work days in advance for activities requiring the participation of Owner's witness.

3.9 COMMISSIONING REPORTS

A. Test Reports:

1. Pre-startup reports include observations of the conditions of installation, organized into the following sections:
 - a. Equipment Model Verification: Compare contract requirements, approved submittals, and provided equipment. Note inconsistencies.
 - b. Preinstallation Physical Condition Checks: Observe physical condition of equipment prior to installation. Note conditions including, but not limited to, physical damage, corrosion, water damage, or other contamination or dirt.
 - c. Preinstallation Component Verification Checks: Verify components supplied with the equipment, preinstalled or field installed, are correctly installed and functional. Verify external components required for proper operation of equipment correctly installed and functional. Note missing, improperly configured, improperly installed, or nonfunctional components.
 - d. Summary of Installation Compliance Issues and Corrective Actions: Identify installation compliance issues and the corrective actions for each. Verify that issues noted have been corrected.
 - e. Evaluation of System Readiness for Startup: For each item of equipment for each system for which startup is anticipated, document in summary form acceptable to Owner completion of equipment model verification, preinstallation physical condition

checks, preinstallation component verification checks, and completion of corrective actions for installation compliance issues.

2. Test data reports include the following:
 - a. "As-tested" system configuration. Complete record of conditions under which the test was performed, including, but not limited to, the status of equipment, systems, and assemblies; temporary adjustments and settings; and ambient conditions.
 - b. Data and observations, including, but not limited to, data trend logs, recorded during the tests.
 - c. Signatures of individuals performing and witnessing tests.
 - d. Data trend logs accumulated overnight from the previous day of testing.
3. Commissioning Compliance Issue Reports: Report as commissioning compliance issues results of tests and test demonstrations that do not comply with acceptance criteria. Report only one issue per commissioning compliance issue report. Use sequentially numbered facsimiles of commissioning compliance issue report form included in this Section, or other form approved by Owner. Distribute commissioning compliance issue reports to parties responsible for taking corrective action. Identify the following:
 - a. Commissioning compliance issue report number. Assign unique, sequential numbers to individual commissioning compliance issue reports when they are created, to be used for tracking.
 - b. Action distribution list.
 - c. Report date.
 - d. Test number and description.
 - e. Equipment identification and location.
 - f. Briefly describe observations about the performance associated with failure to achieve acceptable results. Identify the cause of failure if apparent.
 - g. Diagnostic procedure or plan to determine the cause (include in initial submittal)
 - h. Diagnosis of fundamental cause of issues as specified below (include in resubmittal).
 - i. Fundamental cause of unacceptable performance as determined by diagnostic tests and activities.
 - j. When issues have been resolved, update and resubmit the commissioning issue report forms by completing Part 2. Identify resolution taken and the dates and initials of the persons making the entries.
 - k. Schedule for retesting.
4. Weekly progress reports include information for tests conducted since the preceding report and the following:
 - a. Completed data forms.
 - b. Equipment or system tested, including test number, system or equipment tag number and location, and notation about the apparent acceptability of results.
 - c. Activities scheduled but not conducted per schedule.
 - d. Commissioning compliance issue report log.
 - e. Schedule changes for remaining Commissioning-Process Work, if any.
5. Data trend logs shall be initiated and running prior to the time scheduled for the test demonstration.

- a. Trend log data format shall be multiple data series graphs. Where multiple data series are trend logged concurrently, present the data on a common horizontal time axis. Individual data series may be presented on a segmented vertical axis to avoid interference of one data series with another, and to accommodate different axis scale values. Graphs shall be sufficiently clear to interpret data within the accuracy required by the acceptance criteria.
 - b. Attach to the data form printed trend log data collected during the test or test demonstration.
 - c. Record, print out, and attach to the data form operator activity during the time the trend log is running. During the time the trend log is running, operator intervention not directed by the test procedure invalidates the test results.
6. System Alarm Logs: Record and print out a log of alarms that occurred since the last log was printed. Evaluate alarms to determine if the previous day's work resulted in any conditions that are not considered "normal operation."
- a. Conditions that are not considered "normal operation" shall be reported on a commissioning issue report attached to the alarm log. Resolve as necessary. The intent of this requirement is to discover control system points or sequences left in manual or disabled conditions, equipment left disconnected, set points left with abnormal values, or similar conditions that may have resulted from failure to fully restore systems to normal, automatic control after test completion.

3.10 CERTIFICATE OF CONSTRUCTION-PHASE COMMISSIONING PROCESS COMPLETION

- A. When Contractor considers that construction-phase commissioning process, or a portion thereof which Owner agrees to accept separately, is complete, Contractor shall prepare and submit to Owner and Commissioning Authority through Architect a comprehensive list of items to be completed or corrected. Failure to include an item on such list does not alter Contractor's responsibility to complete commissioning process.
- B. On receipt of Contractor's list, Commissioning Authority will make an inspection to determine whether the construction-phase commissioning process or designated portion thereof is complete. If Commissioning Authority's inspection discloses items, whether included on Contractor's list, which is not sufficiently complete as defined in "Construction-Phase Commissioning Process Completion" Paragraph in the "Definitions" Article, Contractor shall, before issuance of the Certificate of Construction-Phase Commissioning Process Completion, complete or correct such items on notification by Commissioning Authority. In such case, Contractor shall then submit a request for another inspection by Commissioning Authority to determine construction-phase commissioning process completion.
- C. Contractor shall promptly correct deficient conditions and issues discovered during commissioning process. Costs of correcting such deficient conditions and issues, including additional testing and inspections, the cost of uncovering and replacement, and compensation for Architect's and Commissioning Authority's services and expenses made necessary thereby, shall be at Contractor's expense.
- D. When construction-phase commissioning process or designated portion is complete, Commissioning Authority will prepare a Certificate of Construction-Phase Commissioning Process Completion that shall establish the date of completion of construction-phase commissioning process. Certificate of Construction-Phase Commissioning Process Completion shall be submitted prior to requesting inspection for determining date of Substantial Completion.

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SECTION 03 30 00 -**CAST-IN-PLACE CONCRETE****PART 1 GENERAL**

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Footings.
 - 2. Foundation walls.
 - 3. Slabs-on-grade.
- B. Related Sections include the following:
 - 1. Division 2 Section "Earthwork" for drainage (capillary break) fill under slabs-on-grade.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Qualification Data: For installer and supplier.
- E. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
 - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- F. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.

4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Curing compounds.
7. Floor and slab treatments.
8. Vapor retarders.
9. Semirigid joint filler.
10. Joint-filler strips.

G. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specification for Structural Concrete," Sections 1 through 6.
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
1. Plywood, metal, or other approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than **1 inch** to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes no larger than **1 inch** in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, **Grade 60**, deformed.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I or II. Supplement with the following:
 - a. Fly Ash: ASTM C 618, Class F.
- B. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: **3/4 inches** nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.

3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.6 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Admixtures: Use admixtures according to manufacturer's written instructions.
 1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, and concrete with a water-cementitious materials ratio below 0.50.
 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- C. Proportion normal-weight concrete mixtures as follows:
 1. Minimum Compressive Strength: As specified per General Structural Notes, unless otherwise noted.
 2. Maximum Water-Cementitious Materials Ratio: As specified per General Structural Notes.

2.7 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
- B. Project-Site Mixing: Not permitted without prior approval from Architect.

PART 3 EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 1. Class A, **1/8 inch** for smooth-formed finished surfaces.
 2. Class B, **1/4 inch** for rough-formed finished surfaces.

- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. **[Chamfer] [Do not chamfer]** exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints **6 inches** and seal with manufacturer's recommended tape.
- B. Bituminous Vapor Retarders: Place, protect, and repair vapor retarders according to manufacturer's written instructions.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets as specified in General Structural Notes. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of **1/8 inch**. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut **1/8-inch** wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- C. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least **6 inches** into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.7 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.8 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching $0.2 \text{ lb/sq. ft.} \times h$ before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

3.9 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
 1. Steel reinforcement placement.
 2. Steel reinforcement welding.
 3. Headed bolts and studs.
 4. Verification of use of required design mixture.
 5. Concrete placement, including conveying and depositing.
 6. Curing procedures and maintenance of curing temperature.
 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
 8. See the Statement of Special Inspections in General Structural Notes for additional requirements.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 150 cu. yd. or fraction thereof of each concrete mixture placed each day and not less than one composite sample for each 5,000 square feet of surface area for slabs or walls.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one field-cured specimen at 7 days and one set of two specimens at 28 days. Hold remaining specimen for possible further testing.
 - a. A 28-day compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample.
7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
8. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.

END OF SECTION 03 30 00

SECTION 03 35 33 – STAMPED CONCRETE

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. Stamped integral color concrete flooring.

- B. Related Requirements:

- 1. Section 03 30 00 "Cast-in-Place Concrete" for general building applications of concrete.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

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

- B. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color, pattern, or texture selection.

- C. Samples for Verification: For each type of exposed color, pattern, or texture indicated.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer and ready-mix concrete manufacturer.

- B. Material Certificates: For the following, from manufacturer:

- 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Curing compounds.
 - 4. Applied finish materials.
 - 5. Bonding agent or epoxy adhesive.
 - 6. Joint fillers.

- C. Material Test Reports: For each of the following:
 - 1. Aggregates.

- D. Field quality-control reports.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer of concrete paving systems.

- B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

- C. Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.

- 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

- D. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

- 1. Build mockups of full-thickness sections of concrete paving to demonstrate typical joints; surface color, pattern, and texture; curing; and standard of workmanship.
 - 2. Build mockups of concrete paving in the location and of the size indicated or, if not indicated, build mockups where directed by Architect and not less than 96 inches (2400 mm) by 96 inches (2400 mm).
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures.

1.9 FIELD CONDITIONS

- A. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

- 1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

- B. Hot-Weather Concrete Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

PART 2 PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

2.2 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
 1. Use flexible or uniformly curved forms for curves of a radius of 100 feet (30.5 m) or less. [**Do not use notched and bent forms.**]
- B. Forms for Textured Finish Concrete: Units of face design, size, arrangement, and configuration indicated. Provide solid backing and form supports to ensure stability of textured form liners.
- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 1. Portland Cement: ASTM C150/C150M, gray portland cement Type I/II.
 2. Fly Ash: ASTM C618, Class C or F.
- C. Normal-Weight Aggregates: ASTM C33/C33M, Class 4S, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.
 1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
- D. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
 1. Basis of Design Manufacturer: Solomon colors.
- E. Water: Potable and complying with ASTM C94/C94M.

2.4 SURFACE COLORING MATERIALS

- A. Pigmented Mineral Dry-Shake Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.
 1. Basis of Design Manufacturer: Solomon colors.

- B. Pigmented Powder Release Agent: Factory-packaged, dry combination of surface-conditioning and dispersing agents interground with color pigments that facilitates release of stamp mats. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.
 - 1. Basis of Design Manufacturer: Solomon colors.

2.5 STAMPING DEVICES

- A. Stamp Mats: Semirigid polyurethane mats with projecting textured and ridged underside capable of imprinting texture and joint patterns on plastic concrete.
 - 1. Basis of Design Product: Sanded slate as manufactured by Brickform, web: www.brickform.com.

2.6 RELATED MATERIALS

- A. Joint Fillers: As indicated on Drawings.
- B. Bonding Agent: ASTM C1059/C1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.7 CONCRETE MIXTURES

- A. Obtain each color, size, type, and variety of concrete mixture from single manufacturer with resources to provide concrete of consistent quality in appearance and physical properties.
- B. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
- C. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
- D. Limit water-soluble, chloride-ion content in hardened concrete to **[0.15] [0.30]** percent by weight of cement.
- E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.
- F. Concrete Mixtures: Normal-weight concrete.
 - 1. Compressive Strength (28 Days): 4500 psi (31 MPa).
 - 2. Maximum W/C Ratio at Point of Placement: 0.45.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Furnish batch certificates for each batch discharged and used in the Work.
 - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface below the concrete paving to identify soft pockets and areas of excess yielding.
 - 1. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.
- B. Protect adjacent construction from discoloration and spillage during application of color hardeners, release agents, stains, curing compounds, and sealers.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
 - 1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.
- C. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch (6-mm) radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.
 - a. Tolerance: Ensure that grooved joints are within 3 inches (75 mm) either way from centers of dowels.
- D. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation and items to be embedded or cast-in.
- B. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- C. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.
- D. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.
- E. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- F. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
- G. Screed paving surface with a straightedge and strike off.
- H. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

3.6 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

3.7 INTEGRALLY COLORED CONCRETE FINISH

- A. Integrally Colored Concrete Finish: After final floating, apply the following finish:
 - 1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.

3.8 PIGMENTED MINERAL DRY-SHAKE HARDENER APPLICATION

- A. Pigmented Mineral Dry-Shake Hardener Finish: After initial floating, apply dry-shake materials to paving surfaces according to manufacturer's written instructions and as follows:
 - 1. Uniformly apply dry-shake hardener at a rate of 100 lb/100 sq. ft. (49 kg/10 sq. m) unless greater amount is recommended by manufacturer to match paving color required.
 - 2. Uniformly distribute approximately two-thirds of dry-shake hardener over the concrete surface with mechanical spreader; allow hardener to absorb moisture and embed it by power floating. Follow power floating with a second application of pigmented mineral dry-shake hardener, uniformly distributing remainder of material at right angles to first application to ensure uniform color, and embed hardener by final power floating.
 - 3. After final power floating, apply the following finish:

- a. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.

- B. Pigmented Powder Release Agent: Uniformly distribute onto dry-shake-hardened and still-plastic concrete at a rate of 3 to 4 lb/100 sq. ft. (1.5 to 2 kg/10 sq. m).

3.9 STAMPING

- A. Mat Stamping: After floating and while concrete is plastic, apply mat-stamped finish.
 1. Pigmented Powder Release Agent: Uniformly distribute onto concrete at a rate of 3 to 4 lb/100 sq. ft. (1.5 to 2 kg/10 sq. m).
 2. After application of release agent, accurately align and place stamp mats in sequence.
 3. Uniformly load mats and press into concrete to produce required imprint pattern and depth of imprint on concrete surface. Gently remove stamp mats. Hand stamp edges and surfaces unable to be imprinted by stamp mats.
 4. Remove residual release agent according to manufacturer's written instructions, but no fewer than three days after stamping concrete. High-pressure-wash surface and joint patterns, taking care not to damage stamped concrete. Control, collect, and legally dispose of runoff.

3.10 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- C. Curing and Sealing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.11 SEALER APPLICATION

- A. Clear Acrylic Sealer: Apply uniformly in two coats in continuous operations according to manufacturer's written instructions. Allow first coat to dry before applying second coat, at 90 degrees to the direction of the first coat, using same application methods and rates.
 1. Begin sealing dry surface no sooner than 14 days after concrete placement.

3.12 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 (ACI 117M) and as follows:
 1. Elevation: 3/4 inch (19 mm).
 2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
 3. Surface: Gap below 10-foot- (3-m-) long, unlevelled straightedge not to exceed 1/2 inch (13 mm).
 4. Lateral Alignment and Spacing of Dowels: 1 inch (25 mm).
 5. Vertical Alignment of Dowels: 1/4 inch (6 mm).
 6. Joint Spacing: 3 inches (75 mm).
 7. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
 8. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.13 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.
 - 3. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 - 4. Compressive-Strength Tests: ASTM C39/C39M; test one specimen at seven days and two specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
- D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, so no scope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
- G. Stamped concrete will be considered defective if it does not pass tests and inspections.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- I. Prepare test and inspection reports.

3.14 REPAIR AND PROTECTION

- A. Remove and replace stamped concrete that is broken or damaged or does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.
- B. Detailing: Grind concrete "squeeze" left from tool placement. Color ground areas with slurry of color hardener mixed with water and bonding agent. Remove excess release agent with high-velocity blower.

- C. Protect stamped concrete from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain stamped concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 03 35 33

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SECTION 04 22 00

CONCRETE UNIT MASONRY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Division 01 Sections, Drawings, General Conditions, Supplementary Conditions, Special Conditions, and Quality Control apply to this section.
 - 1. Comply with 2024 Greenbook Standard Specifications.

1.2 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units (CMUs).
 - 2. Mortar and grout.
 - 3. Reinforcing steel.
 - 4. Masonry joint reinforcement.
 - 5. Ties and anchors.
 - 6. Embedded flashing.
 - 7. Control joint materials.

1.3 REFERENCES

- A. TMS 602 2016 Specification for Masonry Structures.
- B. ASTM International (latest versions):
 - 1. ASTM A36/A36M Standard Specification for Carbon Structural Steel.
 - 2. ASTM A82/A82M Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - 3. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 4. ASTM A185/A185M Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - 5. ASTM A307 Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - 6. ASTM A615/A615M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - 7. ASTM A641/A641M Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - 8. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
 - 9. ASTM A884/A884M Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement.
 - 10. ASTM A899 Standard Specification for Steel Wire Epoxy-Coated.
 - 11. ASTM A951/A951M Standard Specification for Masonry Joint Reinforcement.
 - 12. ASTM A1008/A1008M Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
 - 13. ASTM C90 Standard Specification for Loadbearing Concrete Masonry Units.

14. ASTM C140/C140M Standard Test Method for Sampling and Testing Concrete Masonry Units.
15. ASTM C150/C150M Standard Specification for Portland Cement.
16. ASTM C270 Standard Specification for Mortar for Unit Masonry.
17. ASTM C476 Standard Specification for Grout for Unit Masonry.
18. ASTM C595/C595M Standard Specification for Blended Hydraulic Cements.
19. ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for use in Concrete.
20. ASTM C989/C989M Standard Specification for Slag Cement for Use in Concrete and Mortars.
21. ASTM C1019 Standard Test Method for Sampling and Testing Grout.
22. ASTM C1314 Standard Test Method for Compressive Strength of Masonry Prisms.
23. ASTM C1586 Standard Guide for Quality Assurance of Mortars.
24. ASTM C1611/C1611M Standard Test Method for Slump Flow of Self-Consolidating Concrete.
25. ASTM C1714/C1714M Standard Specification for Preblended Dry Mortar Mix for Unit Masonry.

1.4 SYSTEM DESCRIPTION

- A. Provide materials to achieve the net compressive strength of concrete unit masonry equal to or greater than the f'_m value stated in the S-1 sheet.

1.5 QUALITY ASSURANCE

- A. Preconstruction Testing.
 1. Cooperate with owner's agent as needed to facilitate sampling and inspections in accordance with TMS 602 and the Statement of Special Inspections.
 2. Construct three prisms for each type of construction.
- B. Sample Panels: Construct an approximate 48" wide by 18" high panel for representation of completed masonry, joint tooling, design details, and workmanship. Comply with requirements in Division 01 Section "Quality Requirements" for mockups.
 1. Install the following in the sample panel:
 - a. 8" x 8" x 16" standard, natural gray
 - b. Meet ASTM C90 Standard Specification for Loadbearing Concrete Masonry Units.

1.6 SUBMITTALS

- A. Obtain written acceptance of submittals prior to use of the following:
 1. Submit mix designs and test reports:
 - a. Preblended mortar:
 - 1) Mix design indicating types and proportions of materials according to proportion specification of ASTM C270, or
 - b. Conventional grout:
 - 1) Mix design and grout strength test performed in accordance with ASTM C476.
 - c. Self-consolidating grout:
 - 1) Compressive strength tests performed in accordance with ASTM C1019, and slump flow and visual stability index (VSI) as determined by ASTM C1611/C1611M.
 2. Submit material certificates for each of the following certifying compliance:
 - a. Concrete masonry units.

- b. Steel reinforcing bars.
 - c. Anchors, ties, fasteners, and metal accessories.
 - d. Preformed control joint gaskets.
- B. Samples for Verification: For each face design, color, and texture of the following:
- 1. Exposed concrete masonry units.
- C. Mortar, for color selection or confirmation.

1.7 SUSTAINABLE DESIGN SUBMITTALS

- A. Environmental Product Declaration (EPD) meeting the following criteria:
- 1. Specific to product and plant location.
- B. Health Product Declaration (HPD) for specified products meeting the following criteria:
- 1. Ingredients reported to 100 ppm.
 - 2. Conforming to Health Product Declaration® Open Standard Version 2.3 or later.
- C. Recycled Content
- 1. Manufacturer's certification of type and percentages of recycled content.
- D. Manufacturing and Material Source Locations: Include in manufacturer's certification for CMU supplied under this Section:
- 1. Angelus Block Co., Inc.
 - a. Oxnard, CA (805) 485-1137
 - 2. L Angelus Block Co., Inc.
 - a. Oxnard, CA (805) 485-1137
 - 3. Locations of raw material sources for ingredients.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect all materials of this section to maintain quality and physical requirements.
- B. Store all masonry units on the jobsite so that they are protected from rain, stored off-ground and kept free of contamination.
- C. Store SPEC MIX preblended mortar mix in manufacturer's original, unopened, undamaged containers with identification labels intact, covered and protected from weather, or in a SPEC MIX dispensing silo.

1.9 FIELD CONDITIONS

- A. Cover top of unfinished masonry work to protect it from the weather.
- B. Implement cold-weather procedures in accordance with TMS 602 when ambient temperature falls below 40°F (4°C).
- C. Implement hot-weather procedures in accordance with TMS 602 when ambient temperature exceeds 100°F (38°C), or exceeds 90°F(32°C) with a wind velocity greater than 8 mph.

PART 2 PRODUCTS

1.10 MANUFACTURER

- A. Basis of design concrete masonry units:
 - 1. Angelus Block Co., Inc.
 - a. Oxnard, CA (805) 485-1137
- B. Preblended mortar:
 - 1. SPEC MIX Preblended Mortar Mix, by E-Z Mix, Inc.
 - a. Sun Valley, CA (818) 768-0568
 - b. Rialto, CA (909) 874-7686
- C. Grout additive:
 - 1. PRE-MIX Products Grout Additive, by E-Z Mix, Inc.
 - a. Sun Valley, CA (818) 768-0568
 - b. Rialto, CA (909) 874-7686

1.11 CONCRETE MASONRY UNITS

- A. Concrete Masonry Units conforming to ASTM C90.
 - 1. CarbonKind concrete masonry units by Angelus Block Co., Inc.
 - 2. Color and texture:
 - a. Gray, standard
 - 3. Sustainable Characteristics:
 - a. Concrete masonry units shall be included in a current Type III Environmental Product Declaration.
 - b. Concrete masonry units shall have an associated Health Product Declaration.
 - c. Obtain CMU produced, and with raw materials sourced, within 500 miles of the project site.

1.12 MORTAR AND GROUT MATERIALS

- A. SPEC MIX Masonry Mortar preblended factory mix conforming to ASTM C270 and ASTM C1714/C1714M. Mortar Type as specified in S-1.
 - 1. Natural gray color.
- B. Water: Potable.
- C. Admixtures:
 - 1. Do not use admixtures except as specified herein, or as approved by the Design Professional and the Building Official.
 - 2. PRE-MIX Products Grout Additive manufactured by E-Z Mix, Inc. Use per manufacturer's specifications.

1.13 REINFORCEMENT AND METAL ACCESSORIES

- A. Provide metal reinforcement and accessories conforming to TMS 602 Article 2.4.

1.14 FLASHING MATERIALS

- A. Provide metal flashing in accordance with Section 07 62 00 Sheet Metal Flashing and Trim.

1.15 MISCELLANEOUS MASONRY ACCESSORIES

- A. Provide masonry accessories conforming to TMS 602 Article 2.5.

1.16 MASONRY CLEANER

- A. Use potable water and detergents to clean masonry unless otherwise approved.
- B. Do not use acid or caustic solutions unless otherwise approved.

1.17 MIXING

- A. Mortar:
 - 1. Mix SPEC MIX Masonry Mortar preblended factory mix per manufacturer's recommendations.
- B. Conventional grout:
 - 1. Mix grout to a consistency that has a slump between 8 and 11 inches per TMS 602 Article 2.6
- C. Self-consolidating grout:
 - 1. Job-site proportioning of self-consolidating grout is not permitted.
 - 2. Do not add water at the job site except in accordance with the manufacturer's recommendations.

1.18 Fabrication

- A. Fabricate reinforcement per TMS 602 Article 2.7 A.

PART 3 EXECUTION

1.19 EXAMINATION

- A. Prior to the start of masonry installation, verify all conditions pertinent to the performance of work in this Section are acceptable in accordance with TMS 602 Article 3.1.

1.20 PREPARATION

- A. Clean and prepare reinforcement, anchor bolts, and foundation, and construct grout spaces in accordance with TMS 602 Article 3.2. Do not wet units before laying, unless otherwise required. Wet cutting is permitted.
- B. Provide cleanouts in accordance with TMS 602 Article 3.2 F.

1.21 INSTALLATION

- A. Select and arrange units for exposed masonry to produce a uniform blend of colors and textures.
 - 1. Mix units from several pallets or cubes as they are placed.
- B. Lay exposed masonry in running bond unless otherwise indicated in Project Drawings.
- C. Lay concealed masonry in running bond unless otherwise indicated.
- D. Place mortar in accordance with TMS 602 Article 3.3 B.
- E. Place mortar and units in accordance with TMS 602 Article 3.3 B.
- F. Install embedded items in accordance with TMS 602 Article 3.3 D.
- G. Provide bracing as necessary in accordance with TMS 602 Article 3.3 E.
- H. Comply with tolerances in TMS 602, Article 3.3 F.

1.22 INSTALLATION OF REINFORCING STEEL, WALL TIES, AND ANCHORS

- A. Install reinforcing steel, wall ties, and anchors in accordance with TMS 602 Article 3.4.

1.23 GROUTING

- A. Comply with grout placement requirements in TMS 602 Article 3.5.

1.24 FIELD QUALITY CONTROL

- A. Cooperate with owner's agent as needed to facilitate sampling and inspections in accordance with TMS 602 and the Statement of Special Inspections.
 - 1. Construct three prisms for each type of construction for every 5,000 sq. ft.

1.25 POINTING, AND CLEANING

- A. Point and tool holes in mortar joints to produce a uniform, tight joint.
- B. During construction, minimize any mortar or grout stains on the wall. Immediately remove any staining or soiling that occurs.
 - 1. For precision or textured units, except as noted below, clean masonry by dry brushing before tooling joints.
 - 2. For burnished, glazed, or pre-finished concrete masonry units, immediately remove any green mortar smears or soiling with a damp sponge.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry surfaces of stains, efflorescence, mortar or grout droppings, and debris.
 - 1. Use appropriate masonry cleaner as tested on the sample panel and as approved by the Design Professional, strictly following manufacturer's recommendations.
 - 2. Do not use acids.

- D. Work, remove all scaffolding and equipment used during construction, and remove all debris, refuse, and surplus masonry material from the site.
 - 1. Comply with Construction Waste Management plan.

1.26 WATER REPELLENT APPLICATION

- A. Cleaning shall be complete and accepted by the Design Professional, and wall surfaces shall be thoroughly dry.
- B. Apply water repellent in strict accordance with Section 07 19 00 and the water repellent manufacturer's instructions.

END OF SECTION 04 22 00

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SECTION 04 20 00 - UNIT MASONRY ASSEMBLIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes unit masonry assemblies consisting of the following:
 1. Concrete masonry units (CMU).
 2. Mortar and grout.
 3. Reinforcing steel.
 4. Ties and anchors.

1.3 DEFINITIONS

- A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths (f_m) at 28 days in accordance with the General Structural Notes.

1.5 QUALITY ASSURANCE

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

PART 2 PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.2 CONCRETE MASONRY UNITS (CMUS)

- A. Concrete Masonry Units: ASTM C90.
 1. Unit Compressive Strength: As specified in General Structural Notes.
 2. Weight Classification: Medium or normal weight, unless otherwise indicated.
 3. Sizes: Nominal 8" high by 16" long units of widths specified, unless otherwise noted.
 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

2.3 MORTAR AND GROUT MATERIALS

- A. Hydrated Lime: ASTM C 270, Type S.

2.4 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M, Grade 60, unless otherwise noted.

2.5 MISCELLANEOUS ANCHORS

- A. Anchor Bolts: As specified in General Structural Notes.
- B. Post-installed Epoxy or Expansion Anchors: As specified in General Structural Notes.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.

- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Comply with construction tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:
 - 1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than **1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch** maximum.
 - 2. For vertical alignment of exposed head joints, do not vary from plumb by more than **1/4 inch in 10 feet, or 1/2 inch** maximum.
 - 3. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than **1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch** maximum.
 - 4. For exposed bed joints, do not vary from thickness indicated by more than plus or minus **1/8 inch**, with a maximum thickness limited to **1/2 inch**. Do not vary from bed-joint thickness of adjacent courses by more than **1/8 inch**.
 - 5. For exposed head joints, do not vary from thickness indicated by more than plus or minus **1/8 inch**. Do not vary from adjacent bed-joint and head-joint thicknesses by more than **1/8 inch**.
 - 6. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than **1/16 inch** except due to warpage of masonry units within tolerances specified for warpage of units.
 - 7. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than **1/16 inch** from one masonry unit to the next.

3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal **4-inch** horizontal face dimensions at corners or jambs.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
 - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 - 3. With webs fully bedded in mortar for starting course on footings.
 - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

- C. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.5 REINFORCED UNIT MASONRY INSTALLATION

- A. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- B. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour and lift height. See General Structural Notes for additional requirements.

3.6 FIELD QUALITY CONTROL

- A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.
 - 1. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.
- B. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports. See the Quality Assurance Plan in the General Structural Notes for additional requirements:
 - 1. Retesting of materials failing to comply with specified requirements shall be done at Contractor's expense.
- C. Testing Frequency: Verification of f'm prior to construction and for every 5000 sq. ft. of wall area or portion thereof during construction. Verification of f'm shall be done per the General Structural Notes.

3.7 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.

END OF SECTION 04 20 00

SECTION 05 50 00 – METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous framing and supports.
2. Shelf angles.
3. Exterior decorative gates.

B. Products furnished, but not installed, under this Section include the following:

1. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

C. Related Requirements:

1. Pertinent Division 01 Sections specifying Volatile Organic Compound (VOC) Content Restrictions

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Fasteners.
2. Shop primers.
3. Shrinkage-resisting grout.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:

1. Miscellaneous framing and supports for applications where framing and supports are not specified in other Sections.
2. Drawings for racks as per district standard.
3. Gate drawings.

- C. Delegated Design Submittals: For gates, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.
- B. Welding certificates.
- C. Research Reports: For post-installed anchors.
- D. Delegated design engineer qualifications.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design gates.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 304.
- D. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 304.
- E. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- F. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.
- G. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: As indicated.

2. Galvanized Steel: ASTM A653/A653M, structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; 0.108-inch (2.8-mm) nominal thickness.
3. Cold-Rolled Steel: ASTM A1008/A1008M, structural steel, Grade 33 (Grade 230); 0.0966-inch (2.5-mm) minimum thickness; hot-dip galvanized after fabrication.

- H. Cast Iron: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.
- I. Aluminum Plate and Sheet: ASTM B209 (ASTM B209M), Alloy 6061-T6.
- J. Aluminum Extrusions: ASTM B221 (ASTM B221M), Alloy 6063-T6.
- K. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.
- L. Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
1. Provide stainless steel fasteners for fastening aluminum stainless steel or nickel silver.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (ISO 898-1, Property Class 4.6); with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 (Grade A325M), Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3, (ASTM A563M, Class 10S3) heavy-hex carbon-steel nuts; and where indicated, flat washers.
- D. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593 (ISO 3506-1); with hex nuts, ASTM F594 (ASTM F836M); and, where indicated, flat washers; Alloy Group 1 (A1).
- E. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.
1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- F. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- G. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless steel bolts, ASTM F593 (ISO 3506-1), and nuts, ASTM F594 (ASTM F836M).
- H. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches (41 by 22 mm) by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches (200 mm) o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 09 91 13 "Exterior Painting." and Section 09 91 23 "Interior Painting."
- B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- C. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- F. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 - 1. Fabricate units from slotted channel framing where indicated.
 - 2. Furnish inserts for units installed after concrete is placed.
- C. Galvanize miscellaneous framing and supports where indicated.
- D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.7 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch (19-mm) bolts, spaced not more than 6 inches (150 mm) from ends and 24 inches (600 mm) o.c., unless otherwise indicated.
 - 1. Provide mitered and welded units at corners.
 - 2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches (50 mm) larger than expansion or control joint.
- B. Prime shelf angles located in exterior walls with zinc-rich primer.

2.8 EXTERIOR DECORATIVE GATES

- A. Basis of Design Manufacturer: Modern metal, web: www.modernmetaldesign.com.
- B. Material: Steel
- C. Post and Design: As per manufacturers shop drawings and as indicated on Drawings.
- D. Finish and Color: As indicated on Drawings.

2.9 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.10 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean galvanized surfaces of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with primers specified in Section 09 91 13 "Exterior Painting" primers specified in Section 09 91 23 "Interior Painting"] unless zinc-rich primer is indicated.
- D. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 3. Items Indicated to Receive Primers Specified in Section 09 96 00 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 4. Other Steel Items: SSPC-SP 3, "Power Tool Cleaning."
 - 5. Galvanized-Steel Items: SSPC-SP 16, "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.11 ALUMINUM FINISHES

- A. As-Fabricated Finish: AA-M12.
- B. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. 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 bituminous paint.
 - 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports ceiling-hung toilet partitions operable partitions overhead doors and overhead grilles securely to, and rigidly brace from, building structure.
- C. Anchor shelf angles securely to existing construction with anchor bolts.

3.3 INSTALLATION OF SHELF ANGLES

- A. Install shelf angles as required to keep masonry level, at correct elevation, and flush with vertical plane.

3.4 INSTALLATION OF GATES

- A. Install gates as per manufacturers standard information.

3.5 REPAIRS

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
 - 2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 13 "Exterior Painting." and Section 09 91 23 "Interior Painting."
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 05 50 00

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SECTION 05 52 00

METAL RAILINGS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Furnish and install Component type aluminum handrails, guardrails, and railing systems, including connectors, fasteners, and system required accessories.

1. Comply with 2024 Greenbook Standard Specifications.

B. Furnish all labor, material, equipment and services required to maintain the landscape in an attractive condition as specified herein for a period of 1 year.

C. Related Sections:

1. Section 329300 – Plants
2. Section 328000 – Irrigation

1.2 WORK FURNISHED

A. Furnish anchors to be cast in concrete Cast-in- Place Concrete.

B. Furnish anchors and fabrications for embedding in masonry to - Masonry Unit System (CMU).

C. Furnish anchors for placement in concrete curb.

1.3 REFERENCES

A. Aluminum Association (AA)

1. ASD-1 Aluminum Standards and Data
2. DAF-45 Designation System for Aluminum Finishes
3. A21 .1 Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
4. A58.1 Minimum Design Loads in Buildings and Other Structures.
5. AI 17.1 Accessible and Usable Buildings and Facilities.

B. American Society for Testing and Materials (ASTM)

1. B 221 Specification for Aluminum-Alloy Bars, Rods, Wires, Shapes and Tubes.
2. B 429 Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
3. D 1730 Recommended Practices for Preparation of Aluminum and Aluminum Alloy Surfaces for Painting.
4. E 894 Standard Test Methods for Anchorage of Permanent Metal Railing Systems and Rails for Buildings.
5. E 935 Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
6. E 985 Specification for Permanent Metal Railing Systems and Rails for Buildings.

C. National Association of Architectural Metal Manufacturers (NAAMM)

1. Metal Finishes Manual
2. Pipe Railing Manual
3. Stair Manual

D. National Ornamental and Miscellaneous Metals Association (NOMMA)

1. Metal Rail Manual

1.4 PERFORMANCE REQUIREMENTS

A. General: In engineering handrail and railing systems to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Aluminum: AA "Specifications for Aluminum Structures."

- B. Structural Performance of Handrails and Railing Systems: Engineer, fabricate, and install handrails and railing systems to withstand the following structural loads without exceeding the allowable design working stress of the materials for handrails, railing systems, anchors, and connections. Apply each load to produce the maximum stress in each of the respective components comprising handrails and railing systems.
 - 1. Toprail of Guardrail System: Capable of withstanding the following loads applied as indicated:
 - a. Uniform load of 50 pounds per lineal foot applied horizontally at right angles to the top rail.
 - 2. Infill Area of Guardrail Systems: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 25 pounds per square foot applied horizontally at right angles over the entire tributary area, including openings and spaces between rails.
 - b. Reactions due to the above load need not be combined with those loads on the toprail of guardrail system.
 - 3. Handrails: The mounting of handrails shall be such that the completed handrail and supporting structure are capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 200 pounds applied in any direction at any point on the handrail.
 - b. These loads shall not be assumed to act cumulatively with those loads on the infill area of guardrail system.
- C. Thermal Movements: Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in engineering, fabricating, and installing of joints, overstressing of components and connections, and other detrimental effects. Base engineering calculations on actual surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.
 - 1. Temperature Change (Range): 120 deg. F ambient; 180 deg. F material surfaces.
- D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.1 SUBMITTALS

- A. Submit shop drawings and product data.
- B. Indicate component details, materials, finishes, connection and joining methods, and the relationship to adjoining work.
- C. Submit manufacturer's installation instructions.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in good condition and properly protected against damage to finished surfaces.
- B. Storage on site:
 - 1. Store material in a location and in a manner to avoid damage. Stacking shall be done in a way that will prevent bending.
 - 2. Store material in a clean, dry location away from uncured concrete and masonry. Cover with waterproof paper, tarpaulin, or polyethylene sheeting in a manner that will permit circulation of air inside the covering.
- C. Keep handling on site to a minimum. Exercise particular care to avoid damage to finishes of material.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. Manufacturers: Subject to compliance with requirements, provide handrails and railing systems

by one of the following or equal:

1. Aluminum Ornamental Railing Systems:
 - a. ALUMINUM TUBE RAILINGS manufactured by

ATR
Technologies,
Inc. 805 Towne
Center Drive
Pomona, CA
91767-5901

Toll Free Phone: (800) 423-4148
Fax: (909) 399-5834
Website: www-ATR-
Technologies.com Email:
railings@ATR-Technologies.com

- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.
- C. Provide all handrails, guardrails, and railing systems from a single manufacturer.

2.02 METALS

- A. General: Provide metal free from surface blemishes where exposed to view in the finished unit. Exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished units are not acceptable.
- B. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of the alloy and temper designated below for each aluminum form required:
 1. Extruded Bar and Tube: ASTM B 221, Alloys 6005-T5, 6061-T6 and 6063-T6.
 2. Extruded Structural Pipe and Tube: ASTM 429, Alloy 6063-T6
 3. Drawn Seamless Tube: ASTM B 210, 6063-T832.
 4. Plate and Sheet: ASTM B 209, Alloys 6061-T6 and 6063-T6.
 5. Die and Hand Forging: ASTM B 247, 6061-T6.
 6. Castings: ASTM B 26, A356-T6.

2.03 RAILING SYSTEM

- A. Material shall conform to 2.02 and be finished in accordance with 2.07.
- B. Railing system shall be permanently anchored.
- C. Top Rails, Handrails and/or Grip rails, Mid Rails and Posts
 1. Fabricate from [anodized] 1-1/2 inch Schedule [40] [80] aluminum pipe.
 2. If required, provide post reinforcement to meet loading criteria.
- D. Fittings and Fasteners: Same basic material and alloy as parts being joined, unless otherwise indicated. Do not use metals that will be corrosive or incompatible with materials being fastened; do not utilize cast fittings.
 1. Component Fittings: Machined from solid extruded 6063-T6 aluminum alloy and finished to match the pipe.
 2. Fasteners: Screws shall be fabricated from galvanized type 304 stainless steel.
- E. Transitions
 1. Formed with uniform radius bend within allowable tolerance of pipe size.
 2. If required, formed with mitered, non-welded, hair-line joints.
- F. Connection Splices
 1. Internal mechanical connection splices shall be of extruded aluminum.
- G. Base Flanges, Anchors, and Inserts:
 1. Manufacturer's standard machined socket bases from solid aluminum stock; no castings of any type allowed (die or sand).
 2. Anchors and inserts as required to support work specified, in accordance with approved shop drawings.
- H. Mounting Wall Brackets
 1. Wall mounted brackets shall be of aluminum attached to bottom side of Handrail and/or Griprail by means of mechanical attachment.
 2. Fasteners: Screws shall be fabricated from galvanized type 304 stainless steel.

2.03 FASTENERS

- A. Fasteners for Anchoring Railings to Other Construction: Select fasteners of the type, grade, and class required to produce connections that are suitable for anchoring railing to other types of construction indicated and capable of withstanding design loadings.
 - 1. For aluminum railings, provide fasteners fabricated from galvanized type 304 stainless steel.
- B. Fasteners for Interconnecting Railing Components: Use fasteners of same basic metal as the fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
- C. Cast-in-Place and Post-Installed Anchors: Anchors of type indicated below, fabricated from corrosion-resistant materials with capability to sustain, without failure, the loads determined by local code requirements.
 - 1. list anchors required

2.04 GROUT AND ANCHORING CEMENT

- A. Non-shrink, Non-metallic Grout: Premixed, factory-packaged, non-shrink, non-metallic, non-staining, non-corrosive grout. Provide grout specifically recommended by manufacturer for interior and exterior applications. Minimum 28 day compressive strength of _ psi.
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Erosion-Resistant Anchoring Cement:
 - a. EMACO[®] GRIP by BASF Building Systems
 - b. QUIKRETE[®] Commercial Grade FastSet[™] by The QUIKRETE Companies

2.05 FABRICATION

- A. Fabricate handrails and railing systems with non-welded, internal and mechanical connections to comply with manufacturer's printed requirements, project design requirements, details, dimensions, finish and member sizes, including post spacing and anchorage, but not less than the structural requirements to support loading.
 - 1. Clearly mark component units for site assembly and installation.
 - 2. Use connections that maintain structural capacity of joined members.
- B. Form all changes in rail direction by uniform radius bend within allowable tolerance of pipe size.
- C. Cut materials square and remove burrs from all exposed edges, with no chamfer.
- D. Make exposed joints butt tight and flush.
- E. Close exposed visible ends of Top Rails and Handrails by use of domed end cap.
- F. Verify dimensions on site prior to shop fabrication.

2.06 FINISHES, GENERAL

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage per manufacturer's recommendations.

2.07 ALUMINUM FINISH

- A. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- B. Anodized finish shall be Class I provided in accordance with AA-M12 C22 A41.
- C. Color: Clear

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine system components, substrate, and conditions where railing systems are to be installed.
- B. Notify landscape architect in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Prepare surrounding construction to receive railing system installations to comply with manufacturer's requirements.
- B. Review and coordinate setting drawings, shop drawings, templates, and instructions for assembly and installation of railing system and related items to be embedded in concrete and masonry. Supply items to be cast in concrete, embedded in masonry.

3.03 DISSIMILAR METALS

- A. When aluminum components come into contact with dissimilar metals, surfaces shall be kept from direct contact by painting the dissimilar metal with a heavy coat of a epoxy/polyurethane [or provide a heavy vinyl tape barrier.
- B. When aluminum components come into contact with cement or lime mortar, exposed aluminum surfaces shall be separated by means of epoxy/polyurethane, heavy vinyl tape or other approved method to prevent electrolytic action.

3.04 INSTALLATION

- A. Install railing system and related components in accordance to shop drawings and to manufacturer's instructions.
- B. Preassemble railing system, including posts, in easy to lift sections whenever possible.
- C. Adjust, level, and securely install railing system components.
 - 1. Avoid springing assembled components of system into place.
- D. Install posts in concrete within preset pipe sleeves within core drilled holes.
 - 1. After posts are inserted, solidly fill the remaining space between post and side of sleeve, or hole, with non-shrink nonmetallic grout and slightly taper away from posts.
- E. Provide for thermal expansion and contraction by use of expansion joints/gaps in top rails at 80 foot (24.384 m) to 120 foot (36.576 m) intervals.
 - 1. Strictly adhere to manufacturer's instructions for locating and fastening expansion joints.
- F. Provide weep holes in hollow sections of railing.

3.05 CLEANING

- A. As installation is completed, wash thoroughly using plain water containing a mild soap or detergent. When preferred, an anodized finish shall be cleaned with white gasoline, kerosene or distillate. Aluminum with a painted finish shall be cleaned with plain water containing a mild soap or detergent.
- B. Do not use an acid solution, steel wool or other harsh abrasives.
- C. If stains remain after washing, remove paint finish and restore in accordance with NAAMM Metal Finishes Manual. Finish must not be removed from anodized aluminum. Reanodizing can only be done by removing railing and returning it to the anodizer.

3.06 PROTECTION

- A. Provide adequate protection for all surfaces of completed installations to prevent damage during remainder of construction activities.

3.07 REPAIR OF DEFECTIVE WORK

- A. Remove stained or otherwise defective work and replace with material that meets specification requirements.

END OF SECTION 05 52 00

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Framing with dimension lumber.
 - 2. Framing with engineered wood products.
 - 3. Wood blocking and nailers.
 - 4. Wood furring.
 - 5. Wood sleepers.
 - 6. Plywood backing panels.
- B. Related Sections include the following:
 - 1. Division 2 Section "Termite Control" for site application of borate treatment to wood framing.
 - 2. Division 6 Section "Sheathing."
 - 3. Division 6 Section "Metal-Plate-Connected Wood Trusses."

1.3 DEFINITIONS

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of **2 inches nominal** or greater but less than **5 inches nominal** in least dimension.
- C. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NLGA: National Lumber Grades Authority.
 - 2. WCLIB: West Coast Lumber Inspection Bureau.
 - 3. WWPA: Western Wood Products Association.

1.4 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

- B. Fastener Patterns: Full-size templates for fasteners in exposed framing.
 - C. 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 ALSC Board of Review.
 - D. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
 - 1. Wood-preservative-treated wood.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

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, [mark grade stamp on end or back of each piece] [or] [omit grade stamp and provide certificates of grade compliance issued by grading agency].
 - 3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 4. 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. Pressure Treatment of Lumber Above Grade: AWWA Treatment C2 using waterborne preservative to 0.25 lb/cu ft retention. Preservatives used shall comply with General Structural Notes.
 - 1. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
 - 1. For exposed lumber indicated to receive a stained or natural finish, [mark end or back of each piece] [or] [omit marking and provide certificates of treatment compliance issued by inspection agency].

- D. Application: Treat items indicated on Drawings, and the following:
1. Wood nailers, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Wood sills, ledgers, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 3. Wood floor plates that are installed over concrete slabs.

2.3 DIMENSION LUMBER FRAMING

- A. Maximum Moisture Content: 19 percent.
- B. **[Non-Load-Bearing]**Interior Partitions: **[No. 2]** grade of any species.
- C. Load-Bearing Framing, including stud walls, joists, rafters, beams, headers and other miscellaneous load bearing members: See General Structural Notes.
- D. Exposed Framing: 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: As indicated above for load-bearing framing of same type.

2.4 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. Furring.
- B. For items of dimension lumber size, provide lumber of same species and grade as load-bearing framing indicated above.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with post-hot-dip galvanized zinc coating complying with ASTM A 153, or mechanically galvanized complying with ASTM B695, Class 55 or greater.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.

- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: **ASME B18.2.1**
- F. Bolts: Steel bolts complying with **ASTM A 307, Grade A**; with **ASTM A 563** hex nuts and, where indicated, flat washers.
- G. Expansion Anchors: Use only expansion bolts listed in General Structural Notes.

2.6 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements listed in General Structural Notes.
- B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, **G60 (Z180)** coating designation.
 - 1. Use for interior locations only.
 - 2. See General Structural Notes for requirements when used in exterior applications or with preservative-treated lumber.
- C. Stainless-Steel Sheet: ASTM A 666, Type 316L.
 - 1. Use for exterior locations and only where specifically indicated in the drawings. See General Structural Notes for other requirements.
- D. Joist Hangers, Holdowns, Hurricane Clips, and other miscellaneous light gage connectors: Refer to Structural Drawings.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- 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, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- D. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.
- E. Do not splice structural members between supports, unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- G. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

- I. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.
- J. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
 1. Comply with indicated fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.

3.2 WALL AND PARTITION FRAMING INSTALLATION

- A. General: Provide single bottom plate (unless double bottom plates are shown on the drawings) and double top plates using members of **2-inch nominal** thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction, unless otherwise indicated.
 1. Provide continuous horizontal blocking at midheight of partitions more than **96 inches** high, using members of **2-inch nominal** thickness and of same width as wall or partitions.
- B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.
- C. Frame openings in accordance with following requirements:
 1. For non-load-bearing partitions, provide double-jamb studs and headers not less than **4-inch nominal** depth for openings **48 inches** and less in width, **6-inch nominal** depth for openings **48 to 72 inches** in width, **8-inch nominal** depth for openings **72 to 120 inches** in width, and not less than **10-inch nominal** depth for openings **10 to 12 feet** in width.
 2. For load-bearing walls, see Structural Drawings.

3.3 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 06 10 00

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SECTION 06 12 00 -

STRUCTURAL INSULATED PANELS

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 WORK INCLUDED

- A. Furnish and install structural insulated panels (SIP) used as exterior insulated load-bearing roof panels.
- B. Factory-install recessed electrical junction boxes, conduit and related accessory materials.
- C. Related work specified elsewhere:
 - 1. Section 07 21 00, Thermal Building Insulation.
 - 2. Section 07 62 10, Galvanized Metal Flashings and Trim.
 - 3. Section 09 26 00, Gypsum Wallboard.
 - 4. Section 07 90 00, Sealants and Joint Fillers.
 - 5. Division 16, Electrical.

1.3 QUALITY ASSURANCE

- A. Reference Standards: Conform to the current requirements of applicable portions of standards, codes and specifications, except where more stringent requirements are shown or specified.
 - 1. NCFI 23-002 Series R polyurethane foam Material Safety Data Sheet (MSDS).
 - 2. ASTM E72 "Standard Test Methods of Conducting Strength Tests of Panels for Building Construction" for compression, transverse, and racking loads.
 - 3. ASTM E84 "Standard Test Method for Surface Burning Characteristics of Building Materials" for smoke spread and flame spread.
 - 4. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials ("Burn-Through" test).
- B. Reference documents:
 - 1. ICS Construction Manual.
 - 2. ICS Construction Detail Drawings.
 - 3. ICS Wall panel 3D representation.
 - 4. ICS One piece corner panel cross section detail.
- C. Manufacturer Qualifications: Manufacturer shall have continuously fabricated structural insulation panel (SIP) systems for a minimum of five (5) years.
- D. Installer Qualifications: Installer shall have a minimum five (5) years successful experience installing SIP systems for projects of similar type, scale and complexity.

- E. Contractor and/or Installer shall be responsible for all components of SIP building system, including but not limited to, attachment to structure and/or substrates, panel-to-panel joinery, panel-to-dissimilar material joinery and joint seal associated with panel system.
- F. Compliance: Each panel shall be labeled indicating the maintenance of factory quality control/third party inspection service in compliance with applicable national codes.
 - 1. Provide evidence of third party inspection and labeling of all materials used in the manufacturing of the SIP's.

1.4 SUBMITTALS

- A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.
- B. Product Data: Submit manufacturer's written product literature, specifications and installation instructions indicating compliance with the requirements of this Section.
 - 1. Manufacturer shall certify that panels have been tested in accordance with ASTM E-72, ASTM E-84, ASTM E119 and other applicable tests.
 - 2. Manufacturer shall supply a hard copy product certificate showing compliance to third party quality control program.
 - 3. Manufacturer shall certify that panel installation is acceptable considering geographic location, building orientation and roof assembly including materials and color shown on the construction documents.
- C. Shop Drawings: Submit shop drawings with a licensed Colorado professional engineer's stamp to indicate design criteria, project layout and elevations, dimensions and thickness of panels, connections, details and location of joints and gaskets including panel joints and joints required for thermal movement, sealants and gaskets, method of anchorage, number of anchors, supports, reinforcement, trim, flashings, recessed electrical boxes and conduit runs, accessories, materials and finishes. Provide evidence of compliance with local code requirements.
- D. Design Calculations: Submit structural calculations stamped by a licensed Colorado professional engineer.
- E. Sample Warranty: Submit sample warranty for review in compliance with paragraph 1.6 below.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Panels shall be delivered to the site bundled in manufacturer's original packaging or protective wrapping.
- B. All panels shall be stored in a protected area, properly supported and not in contact with the ground.
- C. Prior to installation, panels shall be covered and protected from exposure to sunlight and moisture.

1.6 DESIGN CRITERIA

- A. Gravity & Wind loads: See Structural Drawings.
- B. Required Diaphragm Capacities: See Structural Drawings.
- C. Wind uplift shall be calculated for recommended fastening of roof panels by a Colorado licensed professional engineer.

1.7 WARRANTIES

- A. Provide manufacturer's written one (1) year warranty from Substantial Completion covering defects in materials and workmanship.

PART 2 PRODUCTS

2.1 STRUCTURAL INSULATED PANEL (SIP) SYSTEM

- A. General: Structural insulated panels (SIP) used as exterior, insulated load-bearing roof panels, composed of pressure-laminated composites of approved oriented strand board (OSB) facers and UL-Certified polyurethane insulation cores. Panels shall be interlocked using manufacturer's standard splines and integral cam locking system.
1. Oriented Strand Board: APA PRP-108 or PFS PRP-133, Exposure 1, identified with APA or PFS performance rating mark.
 2. Insulated Core: Thermoset polyurethane foam insulation.
 3. Adhesives: Class 2, Type II designed for structural lamination as supplied by Ashland Adhesive NER-165 and Rohm and Haas Company NER-451, or equal.
- B. Splines: Splines for use in joining the SIP system shall be as recommended by the manufacturer and be installed as detailed in the manufacturer's product data and/or shop drawings.
- C. Fasteners: Corrosive-resistant 0.190" shank diameter and a 5/8" pancake head, with #3 square head drive screw for roof, corner and attachment of panel to frame. Zinc galvanized screws, nails or staples for spline and plate attachment shall be supplied or recommended by panel manufacturer.
- D. Caulk/Sealant/Adhesive: Shall be compatible with all components of the panel as supplied or recommended by the panel manufacturer and installed as detailed in the manufacturer's product data.
- E. Dimensional Lumber: DFL #2 or better, or equivalent engineered lumber supplied by the Contractor.
- F. Cam Locking System: As recommended by the manufacturer.
- G. Performance Criteria:
1. Thermal Performance:
 - a. Conductivity of Foam: 0.13 (Btu-in./ft²hr°F)
 - b. R-Value per inch: 6.22 (Ft²hr°F/Btu)
 2. Moisture Performance:
 - a. Vapor Permeability: 2 perm/in
 - b. Moisture Absorption: less than 2.4%
 3. Fire Rating:
 - a. Foam Fire Rating: Class 1
 - b. Smoke Developed: less than 400 (ASTM E-84)
 - c. Flame Spread: less than 25 (ASTM E-84)
 4. Dimensional Tolerance: Shall comply with values listed in the manufacturer's quality control manual.
 5. Structural Testing: Each panel type shown on the Drawings shall meet or exceed performance standards when tested for:
 - a. ASTM E72: Transverse load.
 - b. ASTM E72: Axial compressive load.
 - c. ASTM E72: Racking shear.
 - d. ASTM E72: Header loading.
 - e. ASTM E72: Point loading.

- f. ASTM E1803 -E675: Impact load testing.
- g. ASTM E1803-99: Long term load testing.
- h. ASTM E1803: Cold creep.
- i. ASTM E1803-99 and ICBO AC04: Concentrated load test.

Tested values shall meet or exceed those stated on the manufacturer's load design charts and applicable technical data report.

- H. Electrical Boxes and Conduit: Provide factory-installed electrical junction boxes, conduit and related accessories as shown on the Drawings. Refer to Division 16, Electrical, for material specifications.
- I. Approved Manufacturers: All components specified in this Section shall be provided by the panel manufacturer or its approved supplier.
 - 1. Insulated Component Structures (ICS) SIPs
 - 2. Manufacturers providing products of same function, performance, appearance and quality are acceptable as approved by Architect prior to bidding.

PART 3 EXECUTION

3.1 INSPECTION AND PREPARATION

- A. Contractor shall inspect structure and/or substrate and other conditions which may affect the proper installation of the structural insulated panels (SIP) system. Report any adverse conditions in writing to the Contractor. Do not proceed with installation until adverse conditions have been corrected in a manner acceptable to the Installer.
- B. Any additional structural supports required for installation of SIP systems not shown on the Drawings is the responsibility of the General Contractor (the SIP fabricator), unless arranged for otherwise.
- C. Verify field measurements prior to completion of shop fabrication. Coordinate fabrication schedule with construction progress to avoid delay of work. Field fabrication is allowed to ensure proper fit, but will be subject to approval by the Structural Engineer. Majority of fabrication to be done under controlled shop conditions.
- D. Ensure that electrical rough-in by others is coordinated with locations indicated on the approved shop drawings for conduit connections.
- E. Contractor shall take precautions to keep temperature of SIPs below 165 degrees Fahrenheit during construction.

3.2 PRE-INSTALLATION CONFERENCE

- A. Conduct a pre-installation meeting prior to commencing installation to verify project requirements, substrate conditions, coordination with building subtrades, installation instructions and warranty requirements.

3.3 INSTALLATION OF SIP SYSTEM

- A. General: Installation shall be in strict accordance with the manufacturer's written instructions and recommendations, details and the approved shop drawings. Any conflicts between these documents shall be resolved in writing. Deviations from manufacturer's standard details and load design values shall be calculated and signed and/or sealed by a licensed Colorado professional engineer.
- B. Anchor panels securely per manufacturer's recommendations and in accordance with the approved shop drawings to allow for necessary thermal movement and structural support.

- C. Conform to manufacturer's instructions for installation of concealed fasteners.
- D. Temperature and solvent control shall be conducted in accordance to the reference documents R-Control technical bulletin sip no. 2063 & 2064.
- E. Do not install components that are defective, including warped, bowed, dented or broken members.
- F. Tolerances:
 - 1. Maximum deviation from vertical and horizontal alignment of erected panels: 1/4" in 20', non-accumulative.

3.4 CLEANING AND PROTECTION

- A. Upon completion of installation, clean all SIP component surfaces and leave prepared for further finishing.

END OF SECTION 06 12 00

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SECTION 06 16 00 - SHEATHING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Wall sheathing.
 - 2. Roof sheathing.

- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for plywood backing panels.

1.3 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

- A. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.
- B. Oriented Strand Board: DOC PS 2.
- C. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- D. Factory mark panels to indicate compliance with applicable standard.

2.2 WALL SHEATHING

- A. Plywood Wall Sheathing: See Structural Drawings.
- B. Oriented-Strand-Board Wall Sheathing: See Structural Drawings.

2.3 ROOF SHEATHING

- A. Plywood Roof Sheathing: See Structural Drawings.
- B. Oriented-Strand-Board Roof Sheathing: See Structural Drawings

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. See Structural Drawings for required sheathing nails and framing nails.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Wood Screws: ASME B18.6.1.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. Structural Drawings.
- D. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

END OF SECTION 06 16 00

SECTION 06 17 53 -**METAL-PLATE-CONNECTED WOOD TRUSSES**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Wood roof trusses.
 - 2. Wood girder trusses.
 - 3. Wood truss bracing.
 - 4. Metal truss accessories.
- B. Related Sections include the following:
 - 1. Division 2 Section "Termite Control" for site application of borate treatment to wood trusses.
 - 2. Division 6 Section "Sheathing" for roof sheathing and subflooring.
- C. Allowances: Provide wood truss bracing under the Metal-Plate-Connected Truss Bracing Allowance as specified in Division 1 Section "Allowances."

1.3 DEFINITIONS

- A. Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.
- B. TPI: Truss Plate Institute, Inc.
- C. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NLGA: National Lumber Grades Authority.
 - 2. WCLIB: West Coast Lumber Inspection Bureau.
 - 3. WWPA: Western Wood Products Association.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.
 - 1. Design Loads: As indicated.
 - 2. Maximum Deflection Under Design Loads (Total Load):
 - a. Roof Trusses: Vertical deflection of 1/240 of span.

1.5 SUBMITTALS

- A. Shop Drawings: See General Structural Notes for requirements. Show fabrication and installation details for trusses.
 - 1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
 - 2. Indicate sizes, stress grades, and species of lumber.
 - 3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
 - 4. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
 - 5. Show splice details and bearing details.
 - 6. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- B. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss fabricating firm.
- C. Qualification Data: For metal-plate manufacturer, professional engineer, fabricator and Installer.
- D. 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 ALSC Board of Review.

1.6 QUALITY ASSURANCE

- A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.
 - 1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
 - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.
- C. Source Limitations for Connector Plates: Obtain metal connector plates from a single manufacturer.
- D. Comply with applicable requirements and recommendations of the following publications:
 - 1. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."
 - 2. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."
 - 3. TPI HIB, "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses."
- E. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Handle and store trusses to comply with recommendations of TPI HIB, "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses."
 - 1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.

2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
3. Provide for air circulation around stacks and under coverings.

- B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

1.8 COORDINATION

- A. Time delivery and erection of trusses to avoid extended on-site storage and to avoid delaying progress of other trades whose work must follow erection of trusses.

PART 2 PRODUCTS

2.1 DIMENSION LUMBER

- 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, omit grade stamp and provide certificates of grade compliance issued by grading agency.
 3. Provide dressed lumber, S4S.
 4. Provide dry lumber with 19 percent maximum moisture content at time of dressing.
- B. Grade and Species: For truss chord and web members, provide dimension lumber of any species, graded visually or mechanically, and capable of supporting required loads without exceeding allowable design values according to AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."
- C. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Division 6 Section "Rough Carpentry."

2.2 FABRICATION

- A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.
- B. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.
- C. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.
1. Fabricate wood trusses within manufacturing tolerances in TPI 1.
- D. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install wood trusses only after supporting construction is in place and is braced and secured.
- B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.

- C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
- D. Install and brace trusses according to TPI recommendations and as indicated.
- E. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- F. Space trusses as indicated; adjust and align trusses in location before permanently fastening.
- G. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in truss accessories according to manufacturer's fastening schedules and written instructions.
- H. Securely connect each truss ply required for forming built-up girder trusses.
 - 1. Anchor trusses to girder trusses as indicated.
- I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
 - 1. Install bracing to comply with Division 6 Section "Rough Carpentry."
 - 2. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.
- J. Install wood trusses within installation tolerances in TPI 1.
- K. Do not cut or remove truss members.
- L. Replace wood trusses that are damaged or do not meet requirements.
 - 1. Do not alter trusses in field.

3.2 REPAIRS AND 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.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- C. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- D. Protective Coating: Clean and prepare exposed surfaces of metal connector plates. Brush apply primer, when part of coating system, and one coat of protective coating.
 - 1. Apply materials to provide minimum dry film thickness recommended by coating system manufacturer.

END OF SECTION 06 17 53

SECTION 06 18 00 -**STRUCTURAL GLUED-LAMINATED TIMBER**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes framing using structural glued-laminated timbers.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for dimension lumber items associated with structural glued-laminated timber construction.

1.3 DEFINITIONS

- A. Structural Glued-Laminated (Glulam) Timber: An engineered, stress-rated timber product assembled from selected and prepared wood laminations bonded together with adhesives and with the grain of the laminations approximately parallel longitudinally.

1.4 SUBMITTALS

- A. Product Data: For structural glued-laminated timber.
 - 1. Include data on lumber, adhesives, fabrication, and protection.
 - 2. Include installation instructions for timber connectors.
- B. Shop Drawings: Show layout of structural glued-laminated timber system and full dimensions of each member. Indicate species and laminating combination, adhesive type, and other variables in required work.
- C. Certificates of Conformance: Issued by a qualified testing and inspecting agency indicating that structural glued-laminated timber complies with requirements in AITC A190.1.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide factory-glued structural units produced by an AITC- or APA-licensed firm.
 - 1. Factory mark each piece of structural glued-laminated timber with AITC Quality Mark or APA trademark. Place mark on surfaces that will not be exposed in the completed Work.
- B. Quality Standard: Comply with AITC A190.1, "Structural Glued Laminated Timber."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with provisions in AITC 111, "Recommended Practice for Protection of Structural Glued Laminated Timber during Transit, Storage, and Erection."
- B. Individually wrap members using plastic-coated paper covering with water-resistant seams.

PART 2 PRODUCTS**2.1 STRUCTURAL GLUED-LAMINATED TIMBER**

- A. General: Provide structural glued-laminated timber that complies with the requirements listed in the General Structural Notes.
- B. Species and Grades for Structural Glued-Laminated Timber: See General Structural Notes.
- C. Adhesive: Wet-use type complying with ASTM D 2559.
 - 1. Use adhesive that contains no urea-formaldehyde resins.
- D. End Sealer: Manufacturer's standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.
- E. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.

2.2 FABRICATION

- A. Shop fabricate for connections to greatest extent possible, including cutting to length and drilling bolt holes.
- B. Seal Coat: After fabricating, sanding, and end-coat sealing, apply a heavy saturation coat of penetrating sealer on surfaces of each unit, except for preservative-treated wood where treatment included a water repellent.

2.3 FACTORY FINISHING

- A. Wiped Stain Finish: Manufacturer's standard, dry-appearance, penetrating acrylic stain and sealer; oven dried and resistant to mildew and fungus.
 - 1. Provide color selected by Architect from manufacturer's full range.
 - 2. Provide color matching Architect's sample.
- B. Clear Finish: Manufacturer's standard, two-coat, clear conversion varnish finish; oven dried and resistant to mildew and fungus.

PART 3 EXECUTION**3.1 INSTALLATION**

- A. General: Erect structural glued-laminated timber true and plumb, with uniform, close-fitting joints. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.
 - 1. Lift with padded slings and protect corners with wood blocking.
 - 2. Install structural glued-laminated timber to comply with Shop Drawings.
 - 3. Install timber connectors as indicated.
- B. Fit structural glued-laminated timber by cutting and restoring exposed surfaces to match specified surfacing and finishing.
 - 1. Predrill for fasteners using timber connectors as templates.
 - 2. Dress exposed surfaces to remove planing or surfacing marks and to provide a finish equivalent to that produced by machine sanding with No. 120 grit sandpaper.
 - 3. Coat crosscuts with end sealer.

3.2 ADJUSTING

- A. Repair damaged surfaces and finishes after completing erection. Replace damaged structural glued-laminated timber if repairs are not approved by Architect.

3.3 PROTECTION

- A. Do not remove wrappings on individually wrapped members until they no longer serve a useful purpose including protection from weather, sunlight, soiling, and damage from work of other trades.

END OF SECTION 06 18 00

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SECTION 06 20 13 - EXTERIOR FINISH CARPENTRY

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. Exterior timber header.

- B. Related Requirements:

- 1. Section 09 91 13 "Exterior Painting" for finish painting of exterior finish carpentry.
 - 2. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
 - 3. Section 01 81 13 "Sustainable Design Requirements."

1.3 REFERENCES

- A. Codes and Construction Industry Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- 1. Comply with the latest editions of the standards referenced in this section, except where more stringent standards are specified in this section, shown on the Drawings, or required by the manufacturer.
 - 2. References are to current editions of documents unless earlier editions are specifically referenced by the governing code or are otherwise indicated.

- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."

- C. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.

1.4 ACTION SUBMITTALS

- A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

- B. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

- 1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer's written instructions for finishing treated material.

2. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.
4. Include copies of warranties from chemical-treatment manufacturers for each type of treatment.

C. Samples for Initial Selection: For each type of product involving selection of colors, profiles, or textures.

D. Samples for Verification:

1. For each species and cut of lumber and panel products, with 1/2 of exposed surface finished; 50 sq. in. for lumber and 8 by 10 inches for panels.

1.5 INFORMATIONAL SUBMITTALS

A. Compliance Certificates:

1. For lumber that is not marked with grade stamp.
2. For preservative-treated wood that is not marked with treatment-quality mark.
3. For fire-retardant-treated wood that is not marked with classification marking of testing and inspecting agency.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecast weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in related section.
- B. Composite Wood products must meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as specified in related section.

2.2 MATERIALS, GENERAL

- A. Lumber: DOC PS 20 and the following grading rules:
 - 1. RIS: Redwood Inspection Service, "Standard Specifications for Grades of California Redwood Lumber."
 - 2. WCLIB: West Coast Lumber Inspection Bureau, Standard No. 17, "Grading Rules for West Coast Lumber."
 - 3. WWPA: Western Wood Products Association, "Western Lumber Grading Rules."
- B. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.
 - 1. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by inspection agency.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Water-Repellent Preservative Treatment by Nonpressure Process: AWWA N1; dip, spray, flood, or vacuum-pressure treatment.
 - 1. Preservative Chemicals: 3-iodo-2-propynyl butyl carbamate (IPBC).
 - 2. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated material from untreated material.
 - 3. Application: Exterior trim.
- B. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC3b.
 - 1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 18 percent respectively.
 - 2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 - 3. For exposed items indicated to receive transparent finish, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.
 - 4. Do not use material that is warped or does not comply with requirements for untreated material.
 - 5. Mark lumber with treatment-quality mark of an inspection agency approved by the American Lumber Standard Committee's Board of Review.
 - 6. Application: Where indicated.

2.4 FIRE-RETARDANT-TREATED MATERIALS

- A. General: For applications indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction, and comply with testing requirements; testing by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Exterior Type: Materials shall comply with testing requirements after being subjected to accelerated weathering according to ASTM D 2898.
 - 2. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent respectively.
- C. Do not use material that does not comply with requirements for untreated material or is warped or discolored.
- D. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
- E. Application: Where indicated.

2.5 EXTERIOR TRIM

- A. Lumber Trim for Painted Finish: One of the following;
 - 1. Species and Grade: Redwood, Grade B; RIS.
 - 2. Species and Grade: Western red cedar, Grade B; WCLIB, or WWPA.
 - 3. Species and Grade: Hem-fir, Prime or D finish; NLGA, WCLIB, or WWPA.
 - 4. Maximum Moisture Content: 19 percent with at least 85 percent of shipment at 12 percent or less.
 - 5. Finger Jointing: Not permitted
 - 6. Face Surface: Surfaced (smooth).
 - 7. Factory Priming: Factory coated on faces and edges with exterior primer compatible with topcoats specified.

2.6 MISCELLANEOUS MATERIALS

- A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches into wood substrate.
 - 1. For redwood and cedar, provide stainless-steel fasteners.
 - 2. For pressure-preservative-treated wood, provide stainless-steel fasteners.
 - 3. For applications not otherwise indicated, provide stainless-steel fasteners.
- B. Flashing: Comply with requirements in Section 07 62 00 "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.

2.7 FABRICATION

- A. Back out or kerf backs of standing and running trim wider than 5 inches, except members with ends exposed in finished work.
- B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Prime and backprime lumber and moldings to be painted, including both faces and edges, unless factory primed. Cut to required lengths and prime ends. Comply with requirements in Section 09 91 13 "Exterior Painting."

3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.
- B. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 - 1. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 2. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
 - 3. Coordinate exterior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

- A. Install flat-grain lumber with bark side exposed to weather.
- B. Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long except where necessary.
 - 1. Use scarf joints for end-to-end joints.
 - 2. Stagger end joints in adjacent and related members.
- C. Fit exterior joints to exclude water. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.
- D. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
- E. Finish: Apply finish within two weeks of installation.

3.5 ADJUSTING

- A. Replace exterior finish carpentry that is damaged or does not comply with requirements. Exterior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.6 CLEANING

- A. Clean exterior finish carpentry on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.7 PROTECTION

- A. Protect installed products from damage from weather and other causes during construction.
- B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.
 - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 06 20 13

SECTION 06 20 23 - INTERIOR FINISH CARPENTRY

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. Interior wood trim.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
 - 2. Section 09 91 23 "Interior Painting" for priming and backpriming of interior finish carpentry.

1.3 REFERENCES

- A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."
- B. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- C. Underwriters Laboratories (UL):
 - 1. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details, demonstrate compliance with specified attributes.
 - 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 2. For fire-retardant treatments specified to be High-Temperature (HT) type include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
 - 3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
- B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
 - 1. Fire-retardant-treated wood.
 - 2. Power-driven fasteners.

3. Powder-actuated fasteners.
4. Expansion anchors.
5. Metal framing anchors.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For fire-retardant-treated wood, from ICC-ES.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.
- B. Deliver interior finish carpentry materials only when environmental conditions meet requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.
 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in related section.
- B. Composite Wood products must meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as specified in related section.

2.2 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood).

1. Use treatment that does not promote corrosion of metal fasteners.
2. Use Exterior type for exterior locations and where indicated.
3. Use Interior Type A, unless otherwise indicated.
4. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
5. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
6. Application: Treat items indicated on Drawings, and the following:
 - a. Plywood wainscot panels.

B. Fire Rated Plywood Panels:

IT/Data Closet, Telephone and Electrical Room and similar locations: Interior Fire Retardant-Treated FRS Plywood, Class A, Type 1.

- a. Grade ACX with pine or fir front face, paintable, clean and free of knots.
 - b. Kiln-dried after treatment in accordance with AWPA C27.
 - c. Flame spread less than 5 and smoke developed less than 125 per ASTM E 84 and UL 723.
 - d. Thickness: 3/4-inch (23/32).
2. Plywood Wainscot Panels – Exposed Conditions: DOC PS 1, Exposure 1, C-D Plugged, Interior Fire Retardant-Treated FRS Plywood, in thickness indicated or, if not indicated, not less than 3/4 inch nominal thickness.
- a. Kiln-dried after treatment in accordance with AWPA C27.
 - b. Flame spread less than 5 and smoke developed less than 125 per ASTM E 84 and UL 723.
 - c. Surface Finish: Fully sanded face.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.

1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 18 percent respectively.
2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
3. Do not use material that is warped or does not comply with requirements for untreated material.
4. Mark lumber with treatment-quality mark of an inspection agency approved by the American Lumber Standard Committee's Board of Review.
 - a. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
5. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

2.4 INTERIOR TRIM

A. Lumber Trim for Opaque Finish (Painted Finish):

1. Species and Grade: White Western Softwoods, D Select; WWPA.

2. Species and Grade: Douglas fir-larch or Douglas fir south, Prime or D finish; WCLIB, or WWPA.
3. Maximum Moisture Content: 9 percent.
4. Finger Jointing: Not permitted.
5. Face Surface: Surfaced (smooth).

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

2.6 MISCELLANEOUS MATERIALS

- A. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.
- B. Paneling Adhesive: Comply with paneling manufacturer's written recommendations for adhesives.
- C. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.

2.7 FABRICATION

- A. Back out or kerf backs of the following members except those with ends exposed in finished work:
 1. Interior standing and running trim.
- B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, too small to fabricate with proper jointing arrangements, or with defective surfaces, sizes, or patterns.
- B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 - 1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
 - 3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
 - 4. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.
- C. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit.
- D. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- E. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
 - a. Table 2304.10.1, "Fastening Schedule," in California Building Code.
- F. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.
 - 1. Make tight connections between members.
 - 2. Install fasteners without splitting wood; drive nails snug, but do not countersink nail heads, unless otherwise indicated.
- G. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

3.4 STANDING AND RUNNING TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. **[Cope]** **[Miter]** at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout

length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.

1. Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.
2. Install trim after gypsum-board joint finishing operations are completed.
3. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

3.5 ADJUSTING

- A. Replace interior finish carpentry that is damaged or does not comply with requirements. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.6 CLEANING

- A. Clean interior finish carpentry on exposed and semiexposed surfaces. Restore damaged or soiled areas and touch up factory-applied finishes, if any.

3.7 PROTECTION

- A. Protect installed products from damage from weather and other causes during construction.
- B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.
 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 06 20 23

SECTION 06 41 00 –

ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood-veneer-faced casework for opaque finish.
2. Wood materials.
3. Casework hardware.
4. Shop finishing.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets that are concealed within other construction before cabinet installation.
2. Section 09 22 16 "Non-Structural Metal Framing" for standard, interior non-load-bearing, metal-stud-framing required for anchoring cabinets.
3. Section 12 36 23.13 "Plastic-Laminate-Clad Countertops."

1.2 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Section 08 71 00 "Door Hardware" to manufacturer of architectural cabinets; coordinate Shop Drawings and fabrication with hardware requirements.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review locations and method of attachment of backing required for casework installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include panel material description and finish.
2. Include glazing.
3. Include accessories.
4. Include hardware.
5. Include shop finishing.

B. Shop Drawings:

1. Plans, elevations, sections, and attachment details.

- a. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - b. Show locations and sizes of cutouts and holes for items installed in architectural cabinets.
 - c. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
2. Apply AWI's Quality Certification Program (hereafter AWI QCP) label to Shop Drawings.
- C. Samples for Initial Selection: For each exposed product and for each color and finish specified, in manufacturer's standard size.
- D. Samples for Verification: Provide a minimum of three samples showing the full range of color and/or grain to be expected in the finished work, for the following.
1. Lumber and Panel Products with Shop-Applied Opaque Finish: Not less than 8 inches (200 mm) long by 3/4 inches (19 mm) thick, and as wide as practical, for each species and cut for lumber and 8 by 10 inches (200 by 250 mm) for panels, for each finish system and color.
 - a. Finish entire exposed surface.
 2. Corner Pieces:
 - a. Cabinet-front frame joints between stiles and rails and at exposed end pieces, 18 inches (450 mm) high by 18 inches (450 mm) wide by 6 inches (150 mm) deep.
 - b. Miter joints for standing trim.
 3. Exposed Cabinet Hardware and Accessories: One full-size unit for each type and finish.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Test Reports: Valid AWI "Performance Quality Test Report" indicating compliance with specified ANSI/AWI 0641 Structural Performance Duty Level.
- B. Certification Reports:
1. Provide labels and certificates from AWI QCP indicating woodwork and installation comply with requirements of aesthetic grade and duty level specified.
 - a. Register the Work of this Section with AWI's Quality Certification Program.
 2. The Contract Documents contain requirements that are more stringent than the referenced woodwork quality standard. Comply with requirements of the Contract Documents in addition to those of the referenced quality standard.
- C. Product Certificates: For each type of product.
1. Composite wood products.
 2. Adhesives.
- D. Field quality control reports.
- E. Qualification Statements: For manufacturer and Installer.
- 1.6 CLOSEOUT SUBMITTALS
- A. Quality Standard Compliance Certificates: AWI QCP Certificate.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
 - 1. Manufacturer's Certification: Licensed participant in AWI's Quality Certification Program.
- B. Installer Qualifications: Manufacturer of products.

1.8 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Build mockups of typical architectural cabinets as indicated on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.10 FIELD CONDITIONS

- A. Environmental Limitations without Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Environmental Limitations with Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 30 and 55 percent during the remainder of the construction period.
- C. Field Measurements: Where cabinets are 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 cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.
- D. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. **<Insert, in separate subparagraphs, names of preapproved woodworking firms>.**

2.2 PERFORMANCE REQUIREMENTS

- A. Unless otherwise indicated, comply with ANSI/AWI 0641 for duty level and grade of architectural cabinets indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels and certificates from AWI QCP indicating that woodwork and installation comply with requirements of aesthetic grade and duty level specified.
 - 2. **surfaces] [PVC or polyester] [Match exposed surfaces] <Insert requirements>.**

2.3 WOOD-VENEER-FACED CASEWORK FOR OPAQUE FINISH

- A. Architectural Woodwork Institute (AWI) Standard:
 - 1. Structural Performance Duty Level: As indicated on Drawings.
 - 2. Aesthetic Performance Grade: As indicated on Drawings.
- B. Casework Construction Type: As indicated on Drawings.
- C. Door and Drawer-Front:
 - 1. Design: Stile and rail.
 - 2. Style: As per Drawings.
- D. Exposed Exterior Surfaces: Medium-density fiberboards (MDF).
 - 1. Edgeband: Veneer matching exposed surfaces.
- E. Exposed Interior Surfaces: Medium-density fiberboards (MDF).
 - 1. Edgeband: Match exposed exterior surfaces.
- F. Semiexposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies: Match materials indicated for exposed surfaces.
 - 2. Drawer Sides and Backs: Solid birch or maple hardwood lumber.
 - 3. Drawer Bottoms: Hardwood plywood.
 - 4. Shelves: Adjustable.
 - a. Loading Capacity: 50 lb/sq. ft.
 - 5. Edgeband:
 - a. Edges of Veneer Panels: Veneer compatible for color and grain of exposed surfaces.

2.4 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
 - 1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
 - 2. Wood Moisture Content:
 - a. Non-Climate-Controlled Environments: 10 to 15 percent.
 - b. Climate-Controlled Environments: 8 to 13 percent.

- B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
 - 1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.
 - 2. Softwood Plywood: DOC PS 1, medium-density overlay.
 - 3. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

2.5 CASEWORK HARDWARE

- A. Cabinet Hardware: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 08 71 00 "Door Hardware."
- B. Hinges:
 - 1. Butt Hinges: 2-3/4-inch (70-mm), Grade 1 five-knuckle steel hinges made from 0.095-inch- (2.4-mm-) thick metal, and as follows:
 - a. Semi-Concealed Hinges, Back Mounted, for Flush Doors: ANSI/BHMA A156.9, B01361.
- C. Pulls and Knobs:
 - 1. Wire Pulls: Back mounted, solid metal, [
 - 2. Back-Mounted Knobs: ANSI/BHMA A156.9, B02041.
- D. Shelf Rests and Standards:
 - 1. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04071; with shelf rests, B04081.
- E. Drawer Slides: ANSI/BHMA A156.9.
 - 1. Heavy-Duty (Grade 1HD-100 and Grade 1HD-200): Side mount.
 - a. Type: Full extension.
 - b. Material: Stainless steel slides.
 - 2. Drawer Types:
 - a. General-purpose drawers more than 3 inches (75 mm) high, but not more than 6 inches (150 mm) high and not more than 24 inches (600 mm) wide, provide 75 lb (34 kg) load capacity.
- F. Locks for Drawer and Hinged-Doors: Cylindrical (cam) type, five-pin tumbler, brass with chrome-plated finish, and complying with ANSI/BHMA A156.11, Grade 1.
 - 1. Provide a minimum of two keys per lock and six master keys.
 - 2. Provide locks where indicated.
- G. Door Bumpers: Manufacturer's standard self-adhering clear silicone pads.
- H. Hardware Finish:
 - 1. Exposed Hardware: Provide finish that complies with ANSI/BHMA A156.18 for ANSI/BHMA finish number indicated.
 - 2. Concealed Hardware: Manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.6 FABRICATION

- A. Fabricate architectural cabinets to dimensions, profiles, and details indicated. Ease sharp edges and corners.
- B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of dates and times architectural cabinet fabrication will be complete.
- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. 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.

2.7 SHOP FINISHING

- A. Finish architectural cabinets at manufacturer's shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. Shop-finish transparent-finished architectural cabinets at manufacturer's shop as specified in this Section. See Section 09 91 23 "Interior Painting" for field finishing of opaque-finished architectural cabinets.
- C. Drawings indicate items that are required to be shop finished. Finish these items at manufacturer's shop as specified in this Section. See Section 09 91 23 "Interior Painting" and Section 09 93 00 "Staining and Transparent Finishing" for field finishing of architectural cabinets.
- D. Shop Priming: Shop apply the prime coat including backpriming, if any, for transparent-finished items specified to be field finished. See Section 09 91 23 "Interior Painting" and Section 09 93 00 "Staining and Transparent Finishing" for material and application requirements.
- E. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural cabinets, as applicable to each unit of work.
 - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of cabinets.
- F. Opaque Finish:
 - 1. Aesthetic Performance Grade: Premium.
 - 2. Color: As selected by Architect from manufacturer's full range.
 - 3. Sheen: As per Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of the Work.
 - 1. Confirm location and adequacy of blocking and supports required for installation.
 - 2. Verify size and locations of cutouts for appliances, special equipment, sinks, plumbing, and other items to be mounted in or adjacent to casework.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

3.3 INSTALLATION OF CASEWORK

- A. Install casework to comply with requirements of the structural and aesthetic performance specified.
- B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.
- C. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) using concealed shims.
 - 1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 - 2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 3. Maintain veneer sequence matching of cabinets with transparent finish.
- D. Anchor cabinets in accordance with AWI requirements or tested method to anchors or blocking built in or directly attached to framing or substrates.
 - 1. Install cabinets to comply with seismic requirements as indicated on Drawings.
- E. Shop Finishes: Touch up finishing after installation of architectural cabinets. Fill nail holes with matching filler.
 - 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.
 - a. Use filler matching finish of items being installed.
- F. Field Finishing: See Section 09 91 23 "Interior Painting" and Section 09 93 00 "Staining and Transparent Finishing" for finishing of installed architectural cabinets.

3.4 FIELD QUALITY CONTROL

- A. Inspections: Provide inspection of installed Work through AWI's Quality Certification Program certifying that casework, including installation, complies with requirements of ANSI/AWI 0620 for the specified grade.
 - 1. AWI QCP Inspector to prepare and submit inspection report.

3.5 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where impossible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware and other moving parts to function smoothly.
- C. Clean cabinets on exposed and semi-exposed surfaces. Touch up finishes to restore damaged or soiled areas.

END OF SECTION 06 41 00

SECTION 06 64 00

FIBERGLASS REINFORCED PLASTIC WALL PANELS (FRP)

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. Fiberglass reinforced plastic wall panels.
- B. Related Sections:
 - 1. Section 09 29 00 "Gypsum Board".

1.3 SUBMITTALS

- A. Product Data: Manufacturer's Specifications and installation instructions for each material and accessory.
- B. Shop Drawings: Show location and dimension of joints and fastener attachments.
- C. Samples for Verification: Submit specified color and texture sample of wall panel and trim pieces for verification.
- D. Closeout Submittal: Submit cleaning and maintenance instructions.

1.4 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide fiberglass reinforced plastic (FRP) panels which have been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide wall panels and adhesives with the following fire-test-response characteristics as determined by testing identical products applied with identical adhesives to substrates per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Surface-Burning Characteristics: As follows, Class I per ASTM E 84:
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials clearly labeled to identify Manufacturer, brand name, quality or grade and fire hazard classification.
- B. Store horizontally in original undamaged packages.

- C. Remove foreign matter from face of panel with soft bristle brush, avoiding abrasive action.

1.7 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Install materials when temperature and humidity conditions approximate conditions that will exist when building is occupied.
- B. Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

1.8 EXTRA MATERIALS

- A. Supply two percent of each type used, two sheets minimum in clean condition, marked for Owner's use. Material must be in manufactures package, unopened.
- B. Supply 10% of each type of moldings. Moldings must be packaged in a round tube to be sealed on both ends to protect the moldings from damages. Container must identify the quantity and type of each piece.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: Stabilit America, web: www.stabilitamerica.com.
- B. Manufacturers: Subject to compliance with requirements, provide products from one of the following manufacturer:
 - 1. Kemlite Corporation
 - 2. Marlite, web: www.marlite.com
 - 3. Lasco Panel Products.
- C. Source Limitation: Provide panels and accessories by one manufacturer to ensure warranty and color match.

2.2 MATERIALS

- A. Basis of Design Product: Glasliner FRP panels as manufactured by Stabilit America.
- B. Panels and Accessories: Provide the following:
 - 1. Fiberglass reinforced plastic, 0.09 inches thick, minimum. Product shall meet or exceed the following:
 - a. Flexural Strength (ASTM D790): 10,000 psi
 - b. Flexural Modulus (ASTM D790): 3.10×10^5 psi
 - c. Tensile Strength (ASTM D638): 7000 psi
 - d. Coefficient of Lineal Thermal Expansion (ASTM D696): 2.39×10^5 in/in/°F
 - e. Water Absorption (ASTM D570): < 0.72%
 - f. Flame Spread (ASTM E84): <25
 - g. Smoke Developed (ASTM E84): <450
 - 2. Color/Texture: As indicated on Drawings.
 - 3. Location: As indicated on Drawing.

2.3 ACCESSORIES

- A. Adhesive: Manufacturer's recommended type for use with selected materials, waterproof, mildew resistant nonstaining type.
- B. Sealant: Latex type as approved by adhesive and wall paneling manufacturer.
- C. Moldings:
 - 1. Use extruded aluminum molding trim pieces at internal and external corners, including end cap molding.
 - 2. Use plastic molding at panel divisions.
- D. Miscellaneous Items: Furnish and install supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation, whether or not specified or indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine substrate and conditions under which the material is to be installed.
 - 2. Verify that surfaces, when tested with moisture meter, have proper moisture content.
 - 3. Verify that nails and screws are recessed, with joints and depressions taped, finish and sealed.
 - 4. Remove contaminants from areas to be covered.
 - 5. Do not proceed with Work until work of other trades which passes through wall covering has been completed and unsatisfactory conditions have been corrected.
 - 6. Start of Work indicates acceptance of responsibility for performance and any required remedial Work.

3.2 INSTALLATION

- A. Install panels in accordance with manufacturer's printed instructions using full sheet mastic coverage method with no exposed fasteners or "buttons."
- B. Make joints with 1/8 inch space for expansion and use moldings designed for each condition for the Project.
- C. Bevel edges of panels with block plane to permit proper fit into moldings.
- D. If one end of panel must be nailed, do not nail the other end.
- E. Remove plumbing escutcheons, switchplates, wall plates, and surface-mounted fixtures, and cut wall paneling evenly to fit. Replace items after completion of Work.
- F. Where applicable, install paneling before installation of plumbing, casings, bases, cabinets and other items to be applied over paneling.
- G. Install panels as indicated. If not indicated install in vertical format and cut panels at inside corners. Arrange panels so that no panel is less than 1/2 panel size.

3.3 CLEANING

- A. Remove excess adhesive and smudges with soft cloth and mineral spirits, or with product recommended by wall panel manufacturer.

END OF SECTION 06 64 00

SECTION 07 11 13 – BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold-applied, emulsified-asphalt dampproofing.

B. Related Requirements:

1. Section 03 30 00 "Cast-in-Place Concrete" for bituminous vapor retarders under slabs-on-grade.

1.2 ACTION SUBMITTALS

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

1.3 FIELD CONDITIONS

- A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed in accordance with to manufacturers' written instructions.

- B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain primary dampproofing materials and primers from single source from single manufacturer. Provide protection course and auxiliary materials recommended in writing by manufacturer of primary materials.

2.2 PERFORMANCE REQUIREMENTS

- A. VOC Content: Products are to comply with VOC content limits of authorities having jurisdiction unless otherwise indicated.

2.3 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Acceptable Manufacturers:

1. Henry Company.
2. Sika Company
3. W.R. Meadows.
4. Termco.
5. Substitution: As per Division 01.

- B. Trowel Coats: ASTM D1227/D1227M, Type II, Class 1.

2.4 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with each other and with bituminous dampproofing.
- B. Emulsified-Asphalt Primer: ASTM D1227/D1227M, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.
- C. Patching Compound: Asbestos-free fibered mastic of type recommended in writing by dampproofing manufacturer.

2.5 PROTECTION COURSE

- A. Protection Course, Asphaltic: ASTM D6506/D6506M; semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners.
 - 1. Thickness: Nominal 1/8 inch (3 mm) for vertical applications; 1/4 inch (6 mm) elsewhere.
 - 2. Adhesive: Rubber-based solvent type recommended in writing by dampproofing manufacturer for protection course type.
- B. Smooth-surfaced roll roofing complying with ASTM D6380/D6380M, Class S, Type III.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for surface smoothness, maximum surface moisture content, and other conditions affecting performance of the Work.
- B. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, and treat substrates in accordance with dampproofing manufacturer's written application instructions. Provide clean, dust-free, and dry substrates for dampproofing.
- B. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- C. Clean substrates of projections and substances detrimental to dampproofing work; fill voids, seal joints, and remove bond breakers if any.
- D. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other imperfections.

3.3 INSTALLATION OF BITUMINOUS DAMPPROOFING, GENERAL

- A. Comply with dampproofing manufacturer's written application instructions for cure time between coats and drying time before backfilling unless otherwise indicated.
 - 1. Apply dampproofing to provide continuous plane of protection.
 - 2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
- B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches (150 mm) over outside face of footing.

1. Extend dampproofing 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where indicated as "reinforced," by embedding an 8-inch- (200-mm-) wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

3.4 INSTALLATION OF COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Concrete Foundations and Parged Masonry Foundation Walls: Apply one trowel coat at not less than 4 gal./100 sq. ft. (1.6 L/sq. m).

3.5 INSTALLATION OF PROTECTION COURSE

- A. Install protection course over completed-and-cured dampproofing. Comply with dampproofing-material and protection-course manufacturers' written instructions for attaching protection course.
 1. Support protection course over cured coating with spot application of adhesive type recommended in writing by protection-board manufacturer.
 2. Install protection course within 24 hours of dampproofing installation (while coating is tacky) to ensure adhesion.

3.6 PROTECTION

- A. Protect installed drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where panels are subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- B. Correct dampproofing that does not comply with requirements; repair substrates and reapply dampproofing.

END OF SECTION 07 11 13

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SECTION 07 21 00 - THERMAL INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall Insulation
 - 2. Attic Insulation
 - 3. Spray Insulation
- B. Related Requirements:
 - 1. Section 07 92 00 "Joint Sealants"

1.2 REFERENCES

- A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Wall Insulation
 - 2. Attic Insulation
 - 3. Spray Insulation

1.4 INFORMATIONAL SUBMITTALS

- A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.
 - 1. For blown-in or sprayed fiberglass and cellulosic-fiber loose-fill insulation, indicate initial installed thickness, settled thickness, settled R-value, installed density, coverage area, and number of bags installed.
 - 2. Sign, date, and post the certification in a conspicuous location on Project site.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Research Reports: For foam-plastic insulation, from ICC-ES.
- D. GWP limit for light-density mineral wool board insulation: Provide a Type III EPD (product-specific or factory-specific) that proves the maximum GWP value is 5.83 kg CO₂e/MT per 2022 CALGreen (July 2024 supplement) 5.409.3.
- E. GWP limit for heavy-density mineral wool board insulation: Provide a Type III EPD (product-specific or factory-specific) that proves the maximum GWP value is 14.28 kg CO₂e/MT per 2022 CALGreen (July 2024 supplement) 5.409.3.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in related section.
- B. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indexes less than 25 and 450 when tested in accordance with ASTM E84.
- C. Fire-Resistance Ratings: Comply with ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from listings of another qualified testing agency.
- D. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
- E. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches (305 mm) and wider in width.
- F. Thermal-Resistance Value (R-Value): R-value to be determined by mechanical engineer based on calculations in accordance with ASTM C518.
 - 1. For New Roofs: R-30 minimum
 - 2. Use two or more layers of rigid insulation set in adhesive to achieve R-rating.

2.2 WALL INSULATION

- A. Basis of Design Product: Hempwool batt insulation as manufactured by Hempitecture , web: www.hempitecture.com.
 - 1. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers.
 - a. Owens Corning
 - b. Johns Manville
 - c. Rockwool
 - d. Substitution: As per Division 01
- B. Material: A natural fiber thermal insulation made of 90% hemp fiber and 10% polymer fiber.
- C. Thermal Value: R3.69/in.

- D. Thickness: 5.5 inch

2.3 ATTIC INSULATION

- A. Basis of Design Product: Fiberfill blown in insulation as manufactured by Hempitecture , web: www.hempitecture.com.
 - 1. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers.
 - a. Owens Corning
 - b. Johns Manville
 - c. Rockwool
 - d. Substitution: As per Division 01
- B. Material: Insulation made of 100% cellulose fibers.
- C. Thermal Value: R3.7/in.

2.4 SPRAY INSULATION

- A. Self-Supported, Spray-Applied Cellulosic Insulation: Type III (materials containing an adhesive mixed with water during application).
- B. Basis of Design Product: Icynene closed cell spray insulation as manufactured by Huntsman building solution , web: www.huntsmanbuildingsolutions.com.
 - 1. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers.
 - a. Owens Corning
 - b. Johns Manville
 - c. Rockwool
 - d. Substitution: As per Division 01
- C. Thermal Value: Minimum R-23
- D. Water Vapor Permeance: .91 perms
- E. Tensile strength: 44psi
- F. Air permeance: <0.02L/sm²

2.5 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.
 - 1. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.
 - 2. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation.
- B. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.

2.6 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
 - 1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
 - 2. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.
 - 3. Polyurethane Pour-In-Place Insulation: Closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84, specifically formulated for pour-in-place applications.
- B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Install insulation with manufacturer's R-value label exposed after insulation is installed.
- D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSULATION INSTALLATION – ROOFING

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
 - 1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
 - 2. Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
 - 3. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft. (0.3 L/sq. m), and allow primer to dry.
 - 4. Set each layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.

- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 -inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 -inches (150 mm) in each direction.
 - 1. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 -inch (6 mm) with insulation.
 - 1. Cut and fit insulation within 1/4 -inch (6 mm) of nailers, projections, and penetrations.
- G. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together and fasten to roof deck.
 - 1. Fasten cover boards according to requirements in FM Global's "RoofNav" for specified Windstorm Resistance Classification.
 - 2. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Wall Insulation (Batt Insulation): Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - 4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation.
- C. Attic Insulation (Loose-Fill Insulation): Apply in accordance with ASTM C1015 and manufacturer's written instructions.
 - 1. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.
 - 2. For cellulosic-fiber loose-fill insulation, comply with CIMA's Technical Bulletin #2, "Standard Practice for Installing Cellulose Building Insulation."
- D. Spray-Applied Cellulosic Insulation: Apply spray-applied insulation in accordance with manufacturer's written instructions.
 - 1. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked.
 - 2. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

3.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 25 00 – WEATHER BARRIERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Water and air barrier.
- B. Related requirements
 - 1. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
 - 2. Pertinent Sections specifying sustainable design requirements.
 - 3. Pertinent sections specifying exterior cladding or finishes.

1.2 REFERENCES

- A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- B. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code 2012, with 2013 California Amendments.
- C. AATCC Test Method 127 - Water Resistance: Hydrostatic Pressure Test; 1998.

1.3 SUBMITTALS

- A. General: Submit in accordance with Section 01 3300.
- B. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.
- C. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
 - 1. Include manufacturer's written instructions, technical data, and tested physical and performance properties.
 - 2. Include data on air and water-vapor permeance based on testing according to referenced standards.
- A. Shop Drawings: Show locations and extent of weather barrier. Include details for substrate joints and cracks, counterflashing strip, penetrations, window and door sequences, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - 1. Shop drawings shall include project-specific conditions. Installer shall indicate extent of scope and provide details showing integrations with adjacent materials, systems and trades
- B. Manufacturer's Instructions: Provide manufacturer's instructions showing the recommended procedures and sequence of installation of weather barrier.
- C. Samples:
 - 1. Weather Barrier: Submit samples cascaded on gypsum sheathing, minimum 10 x 10 inches in size.
 - 2. Membrane Flashings and Tapes: Submit samples minimum 12 inches long.

- D. Test Reports: Submit documentation from independent testing laboratory certifying:
 - 1. Weather barrier sheet meets specified requirements for air leakage, water vapor permeance, water resistance, tensile strength and surface burning characteristics.
 - 2. Weather barrier membrane meets ICC-ES A38.
- E. Manufacturer's Certificates: Submit certification of compatibility of weather barrier and accessory materials with other project materials that connect to or that come in contact with weather barrier, signed by manufacturer.
- F. Installer Certificates: Signed by manufacturers certifying the installers comply with requirements.
- G. Qualification Data: For installer.
- H. Warranties: Special warranties specified in this Section.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For water-resistive barrier and flexible flashing, from ICC-ES.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in production of waterproofing and weather barrier systems with minimum 10 years documented continuous experience in the manufacture of water-resistive air barrier products and employing experienced in-house technical and field observation personnel qualified to provide expert technical support.
- B. Installer Qualifications: Company specializing in installation of weather barrier systems with minimum 5 years documented experience and approved by manufacturer, that employs installers and supervisors who are trained and approved by manufacturer.
 - 1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.
- C. Preinstallation Conference: Conduct conference at Project site after review of complete submittals. Comply with requirements in Division 1 Section "Project Management and Coordination." Review requirements for underlayment, including surface preparation specified under other Sections, substrate condition and pretreatment, temporary weather protection, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.6 MOCK-UPS

- A. Construct mock-up assemblies illustrating full range of material interfaces and seals. Use the manufacturer's application instructions. Keep mock-ups available for inspection throughout the project and remove when complete, or as directed.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of Section 01 6000.
- B. Deliver materials to Project site in original containers with seals unbroken, wrapped in a polythene sleeve, labeled with manufacturer's name, and product brand name.
- C. Store rolls under cover, on a clean, level surface, either flat or upright.

1.8 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written installation instructions and warranty requirements.

1.9 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's written material warranty agreeing to replace weather barrier membrane materials installed in conformance with manufacturer's written installation instructions that fail within 5 years from date of Substantial Completion.
- B. Installer's Warranty: Provide installer's written 2 -year warranty upon completion of work. Include removing and reinstalling collateral materials associated with replacement of waterproofing that fails within specified warranty period.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC Limits for adhesives sealants, fillers, primers and coatings. Comply with limits specified in Division 01.
- B. General: Weather barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Weather barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- C. The building envelope shall be designed and constructed with a continuous air barrier to control air leakage into, or out of the conditioned space. An air barrier shall also be provided for interior partitions between conditioned space and space designed to maintain temperature or humidity levels which differ from those in the conditioned space by more than 50% of the difference between the conditioned space and design ambient conditions. The air barrier shall have the following characteristics:
 - 1. Continuous, with all joints made airtight.
 - 2. Air Permeability not to exceed 0.004 cfm/sq. ft. under a pressure differential of 0.3 in. water. (1.57 psf) (equal to 0.02L/sq. m @ 75 Pa), when tested in accordance with ASTM E2178.
 - 3. Capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.
 - 4. Durable and maintainable.
 - 5. Joined in an airtight and flexible manner to the air barrier material of adjacent systems, allowing for the relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between:
 - a. Foundation and walls.
 - b. Walls and windows or doors.
 - c. Different wall construction and cladding assemblies.
 - d. Wall and roof.
 - e. Wall and roof over unconditioned space.
 - f. Walls, floor and roof across construction, control and expansion joints.
 - g. Walls, floors and roof to utility, pipe and duct penetrations.

6. All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made airtight.

2.2 WEATHER BARRIERS

- A. Basis of Design Product: Tyvek stucco wrap, as manufactured by Dupont, web: www.dupont.com.
- B. Material Composition: Textured, spunbonded polyolefin, non-woven, non-perforated, weather barrier
- C. Size: As indicated on Drawings.
- D. Physical Properties:
 1. Air Penetration: 0.004 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2178. Type I per ASTM E1677.
 2. Water Vapor Transmission: 50 perms, when tested in accordance with ASTM E96, Method B.
 3. Water Penetration Resistance: 210 cm when tested in accordance with AATCC Test Method 127.
 4. Air Resistance: 300 seconds, when tested in accordance with TAPPI Test Method T-460.
 5. Tensile Strength: 30/30 lbs/in., when tested in accordance with ASTM D882, Method A.
 6. Tear Resistance: 7/9 lbs, when tested in accordance with ASTM D1117.
 7. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84. Flame Spread: 5, Smoke Developed: 25

2.3 ACCESSORY MATERIALS

- A. Requirement: Provide primers, fasteners, seam tapes, flashing, transition strips, termination strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by weather barrier manufacturer to produce a complete weather barrier assembly and that are compatible with primary weather barrier material and adjacent construction to which they may seal.
- B. Flashing:
 1. DuPont FlexWrap NF, as manufactured by DuPont Building Innovations: flexible membrane flashing materials for window openings and penetrations.
- C. Tape: Pressure-sensitive plastic tape recommended by weather barrier manufacturer for sealing joints and penetrations in commercial building wrap.
- D. Fasteners with Self-Gasketing Washers: Manufacturer's recommended pneumatically or hand-applied fasteners with 1-inch- (25-mm-) diameter, high-density polyethylene cap washers with UV inhibitors.
- E. Sealants: Comply with Section 07 92 00

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements and other conditions affecting performance.

3.2 SURFACE PREPARATION

- A. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean and dry substrate.

- B. Surfaces shall be sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods that are acceptable to manufacturer of the fluid-applied waterproofing.
- C. Do not install materials during rain or snowfall.
- D. Exterior sheathing panels: Ensure that the boards are sufficiently stabilized with corners and edges fastened with appropriate screws in accordance with exterior sheathing manufacturers written instructions.

3.3 INSTALLATION OF WEATHER BARRIERS

- A. Comply with weather barrier manufacturer's written installation guidelines and warranty requirements.
- B. Cover exposed exterior surface of sheathing with weather barrier securely fastened to framing immediately after sheathing is installed.
 - 1. Maintain continuity of air and water barrier assemblies.
 - 2. Start weather barrier installation at a building corner, leaving 12 inches (300 mm) of weather barrier extended beyond corner to overlap.
 - 3. Install weather barrier horizontally starting at lower portion of wall surface.
 - 4. Provide minimum 6 inches (150 mm) overlap at horizontal- and vertical-wrap seams in a shingle manner to maintain continuous downward drainage plane and air and water barrier.
- C. Seams: Seal seams with building wrap tape per manufacturer's recommended installation instructions.
- D. Fasteners: Use weather barrier manufacturer's recommended fasteners to secure weather barrier and install fasteners according to weather barrier manufacturer's installation guidelines.

3.4 MEMBRANE INSTALLATION AT WINDOW AND DOOR OPENINGS

- A. Install weather barrier membrane at window and door openings in accordance with manufacturer's instructions.
- B. Install weather barrier membrane to create a continuous seal at window and door openings.

3.5 FIELD QUALITY CONTROL

- A. Owner will engage an independent inspector to observe substrate and installation. Inspector shall provide a written, sign-off log, on all penetrations before the underlayment is placed against them. Architect shall approve form of log before contract with inspection service is approved.
- B. Inspections: Weather barrier materials and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of weather barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Continuous structural support of weather barrier system has been provided.
 - 3. Site conditions for application temperature and dryness of substrates have been maintained.
 - 4. Maximum exposure time of materials to UV deterioration has not been exceeded.
 - 5. Surfaces have been primed, if applicable.
 - 6. Laps in transition membrane have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fish-mouths.

7. Termination sealant has been applied on cut edges.
8. Transition membrane has been firmly adhered to substrate.
9. Compatible materials have been used.
10. Transitions at changes in direction and structural support at gaps have been provided.
11. Connections between assemblies (membrane and sealants) have complied with requirements for cleanliness, preparation and priming of surfaces, structural support, integrity, and continuity of seal.
12. All penetrations have been sealed.

C. Remove and replace deficient weather barrier components and re-inspect as specified above.

3.6 CLEANING AND PROTECTION

- A. Weather Barrier Membrane is not suitable for permanent exposure and must be protected from the effects of sunlight.
- B. Schedule work to ensure that the Weather Barrier Wall Membrane system is covered as soon as possible after installation. Protect Weather Barrier Wall Membrane system from damage during subsequent operations. If the Weather Barrier Wall Membrane system cannot be covered within 30 days after installation, apply temporary UV protection such as dark plastic sheet or tarpaulins.
 1. Remove and replace weather barrier exposed for more than 150 days.
- C. Protect installed weather barriers from damage due to harmful weather exposures, physical abuse, and other causes.
 1. Repair damaged weather barrier as recommended by manufacturer.
 2. Damage includes: Rips, tears, mechanical damage, mud, marks, chemical and mortar spills.

END OF SECTION 07 25 00

SECTION 07 26 00 - BELOW GRADE VAPOR RETARDERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Under slab vapor retarder membrane and assembly
 - 2. Seam tape and mastic.
 - 3. Pipe boots.
 - 4. Formwork Stakes.
- B. Related Requirements
 - 1. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
 - 2. Pertinent Sections specifying sealants or referencing this Section for sealant products and Execution Requirements.
 - 3. Section 03 30 00 "Cast In Place Concrete" for coordination of vapor retarder installation during base preparation for slab on grade installations.
 - 4. Section 07 11 00 "Sheet Membrane Waterproofing" for vapor retarder for perimeter foundation walls and floor slabs below grade.

1.3 REFERENCES

- A. Codes and Standards: Comply with the provisions of the documents listed below and with the requirements described in this Section.
 - 1. Use current editions of documents unless earlier editions are specifically referenced by the governing code or are otherwise indicated.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."
- C. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California Amendments.

1.4 DEFINITIONS

- A. Perm: 1 grain/h•ft²•in-Hg.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
 - 1. Include penetration accessories and tape.

- B. Test Data: Submit independent third-party test data for all listed performance values to show compliance with this specification. All test data for review shall be as published and released for publication by the authors without restriction of distribution.
 - 1. Summary of test results as described in ASTM E1745.
 - a. Certify that all mandatory ASTM E1745 testing has been performed on a single production roll per ASTM E1745 Section 8.1. Test reports must specifically state that sampling and testing of materials are in strict accordance with the requirements of the standard.
 - 2. Manufacturer's samples and literature.
 - 3. Manufacturer's installation instructions for placement, seaming and penetration repair instructions.
- C. Closeout Submittals:
 - 1. Submit under provisions of Division 01.
 - 2. Warranty: Submit specified warranty.

1.6 QUALITY ASSURANCE

- A. Mockups: Vapor Retarder membrane including stake placement, pipe penetrations and securing to concrete surfaces to demonstrate standard of workmanship.
 - 1. Build panel approximately 100 -sq. ft. (9.3 sq. m).
 - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 SEQUENCING

- A. Begin installation only after substrate work is complete and penetrations are securely anchored.
- B. Coordinate with work as specified in Division 03 "Cast-in-Place Concrete" and "Concrete Reinforcing".

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC Limits for adhesives, sealants, fillers and primers. Comply with limits specified in pertinent Division 01 Sections.
- B. "California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

2.2 MANUFACTURERS

- A. Basis-of-Design: Stego Wrap 15 Mil thick Vapor Retarder by Stego Industries LLC., web: www.stegoindustries.com.
 - 1. Subject to compliance with requirements, provide the named product or a comparable product by one of the following manufactures:
 - a. ECOSHIELD-E15, 15-mil thick Sheet Membrane Vapor Retarder, by Epro Waterproofing Systems, www.eproserv.com .
 - b. W.R Meadows, PERMINATOR, 15-mil thick, www.meadows.com
 - c. Substitutions: Per division 01.

2.3 MATERIALS

- A. Vapor Retarder Polyolefin geotextile membrane, manufactured with prime, virgin resins with the following properties.
1. Water Vapor Retarder: Class A (Plastics) per ASTM E1745
 2. Permeance Rating: 0.01 perms, max. per ACI 302.2R-06 recommendation & ASTM E1745 Section 7.1 (7.1.1 – 7.1.5)
 3. Permeance Testing: Comply with ASTM F 1279 or ASTM E154, by ASTM E96, Method B
 4. Puncture Resistance: 2200 grams, min per ASTM D1709 (Method B)
 5. Tensile Strength: 45.0 lbf./in per ASTM D882 or ASTM E154, sec. 9
 6. Membrane Thickness: 15 mil
- B. Joint Tape: Manufacturer's recommended, double sided, adhesive tape with release paper on each face.
1. Thickness: 6- mils minimum.
 2. Performance Criteria:
 - a. ASTM E1643 – Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
 - b. PSTC 101 – International Standard for Peel Adhesion of Pressure Sensitive Tape
 - c. Fire Rating: Class A
 - d. ASTM E96 – Standard Test methods for Water Vapor Transmission of Materials.
 - e. ASTM D5147 Standard Test Methods for Sampling and Testing Modified Bituminous Material.
 - f. ASTM D903 Standard Test Method for Peel or Stripping of Adhesive Bonds
 - g. ASTM D1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - h. PSTC 101 – International Standard for Peel Adhesion of Pressure Sensitive Tape
 3. Do not leave prolonged to direct sunlight.
- C. Mastic Adhesive: Type recommended by manufacturer, non-sagging grade, compatible with sheet and substrate.
1. Water Vapor Transmission Rate shall be 0.17 perms or lower per ASTM E96.
- D. Pipe Boots:
1. Construct pipe boots from vapor Retarder material, pressure sensitive tape, and mastic per manufacturer's instructions.
- E. Vapor Retarder Stakes: Intended as option if floating form work is not used.
1. Basis-of-Design: Polyvinyl Black VaporStake™, by Vaporstake, LLC, www.vaporstake.com
 - a. Solid Plastic construction: ASTM E1643-11 (sec. 8.4 & 8.6) and ACI 302.2R-06.
 - b. Use with Vapor Retarders: ASTM E1745-09
 - c. Recycled content: 100%
 - d. Size: Length for application and diameter per mfgr. for application

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine conditions and proceed with Work when substrates are ready.
- B. Verify that substrate work is complete, clean, and dry and installed in accordance with contract documents before beginning installation of sheet products.
- C. Level and tamp or roll aggregate, sand or tamped earth base.

3.2 INSTALLATION

- A. Under Slab-on-Grade: Installation shall be in accordance with manufacturer's instructions and ASTM E1643-98.
 - 1. Unroll Vapor Retarder membrane with the longest dimension parallel with the direction of the concrete pour.
 - 2. Extend vapor barrier over footings and grade beams to a distance acceptable to the structural engineer or stop at impediments such as dowels and waterstops.
 - 3. Seal vapor barrier to footing/grade beam with double sided tape, termination bar, or both.
 - 4. Lay-out sheets to minimize quantity of joints.
 - a. Lap edge 6 -inches minimum and end joints 12 -inches minimum and continuously seal with joint tape.
 - 5. Apply tape to a clean and dry vapor retarder membrane.
 - 6. Terminate Retarder per manufacturer's recommendations along perimeter; at footers, vertical walls, and against penetrations.
 - a. Seal perimeter with continuous mastic bead along foundation walls.
 - b. Seal barrier joints with tape.
 - 7. No penetration of the Vapor Retarder membrane is allowed except for reinforcing steel and permanent utilities.
 - a. Seal all penetrations (including pipes) with field-assembled boots per manufacturer's instructions.
 - b. In the case that forms must be used, Vapor Stakes should be used to hold forms in place.
 - 1) Penetrate vapor Retarder with stake.
 - 2) Treat stake as pipe penetration.
 - 3) Leave stake permanently in concrete.
 - 4) Using a power saw, cut the stake off above the seal, but below the concrete's finished surface not higher than elevation of horizontal reinforcing.
 - 5) The lower portion of the vapor stake remains in place, permanently plugging the penetration.
 - 8. Refer to Division 03 "Cast-in-Place Concrete" for installation coordination requirements.
 - 9. Repair damaged areas by cutting patches of Vapor Barrier/Retarder, overlapping damaged area 6 -inches and taping all four sides with tape.
 - a. Do not use concrete adhesion tape to repair penetrations.
- B. Due to the possibility of differential settlement, adhere the vapor retarder at building perimeter and in a grid pattern every 4 -feet on-center with integrally bonded detail tape for concrete adhesion.

3.3 PROTECTION

- A. Protect sheets from puncture during installation. Patch punctures before proceeding with subsequent construction.
- B. Note: Screeding stakes driven through retarder must be repaired per manufacturer's recommendation.
- C. Install runway planks in construction traffic lanes until slabs are poured.

3.4 FIELD QUALITY CONTROL

- A. Conduct a visual inspection, in the presence of the Architect/Engineer, of the entire Retarder installation the day before placing concrete. Make all corrections prior to placing concrete.

END OF SECTION 07 26 00

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SECTION 07 32 00 - COMPOSITE ROOF TILES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Composite roof tiles.
 2. Underlayment materials.
 3. Fire resistant sheets.
 4. Self-adhering flashing.
 5. Intumescent soffit and ridge vents.
 6. Metal flashing and trim.

1.2 REFERENCE STANDARDS

- A. International Code Council (ICC): ES Acceptance Criteria AC07 Section 4.9.
- B. UL 790 - (Exterior Exposure), Standard Test Methods for Fire Tests of Roof Coverings.
- C. UL 997 - Wind Resistance of Prepared Roof Covering Materials.
- D. UL 2218 - Impact Resistance of Prepared Roof Covering Materials.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each product listed.
1. Manufacturer's data sheets on each product to be used.
 2. Preparation instructions and recommendations.
 3. Storage and handling requirements and recommendations.
 4. Typical installation methods.
- B. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
1. Include plan, elevation and section of roof.
 2. Include attaching details and overlap details for all the materials going below the roof tiles.
 3. Include the installation details for the roof tiles.
 4. Include the ESR reports for the materials included.
- C. Samples for Initial Selection: For each type of clay roof tile and accessory tile.
1. Include Samples of accessories involving color selection.

D. Samples for Verification: For the following products, in sizes indicated:

1. Composite Roof Tiles: Full size, showing full range of color values and blends.
2. Accessory Tiles: Full size, each type.
3. Metal Flashing: 12 inches (305 mm) square.
4. Ridge Vents: 12-inch- (305-mm-) long Sample.
5. Eave Closures: In manufacturer's standard size.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Test Reports: For each type of composite roof tile, based on evaluation of comprehensive tests performed by a qualified testing agency.
- B. Sample Warranty: For manufacturer's materials warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing to include in maintenance manuals.
- B. Materials warranties.
- C. Roofing Installer's warranty.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Composite Roof Tiles: 100 sq. ft. (9.3 sq. m) of each type, in unbroken bundles.

1.8 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 1. Build mockups for composite roof tiles including related roofing materials.
 - a. Size: 48 inches (1219 mm) long by 48 inches (1219 mm) wide.
 - b. Include gutter and downspout complying with requirements in Section 07 62 00 "Sheet Metal Flashing and Trim."
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store underlayment rolls in a dry, well-ventilated location protected from weather, sunlight, and moisture in accordance with manufacturer's written instructions.
 1. Store on end, on pallets or other raised surfaces. Do not double-stack rolls.
- B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing Work is not in progress.

- C. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Proceed with installation only when existing and forecasted weather conditions permit product installation and related Work to be performed in accordance with manufacturer's written instructions and warranty requirements.

- 1. Install self-adhering, modified bitumen sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

1.11 WARRANTY

- A. Materials Warranty: Manufacturer agrees to repair or replace composite roof tiles that fail in materials within specified warranty period.

- 1. Warranty Period: 50 years from date of Substantial Completion.

- B. Underlayment Warranty: Provide manufacturer standard 50 years warrant for the underlayment products.

- C. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of clay-tile roofing that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of product from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide composite roof tiles and related roofing materials identical to those of assemblies tested for Class A fire resistance in accordance with ASTM E108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

- B. Energy Performance, Energy Star: Provide roof tiles that are listed on the DOE's "Energy Star Roof Product List" for steep-slope roof products.

- C. Accelerated weathering: Little change after 2,500 hours exposure to ultraviolet (UV) radiation, elevated temperature, moisture, and thermal shock.

2.3 COMPOSITE ROOF TILES

- A. Basis of Design Product: Brava Spanish barrel tile as manufactured by Brava Roof Tile, web: www.bravarooftile.com

- 1. Substitution: As per Division 01

- B. Material: Engineered polymer formulated from post-industrial recycled plastic.

- C. Profile: Barrel shape with exposed upper surface and edges as per manufacturer's standard profile.

- D. Eave Starter: 3 inches (76 mm) wide by 11.75 inches (298 mm) long.

- E. Markings: Form tiles with markings on upper surface to indicate nailing locations and provide alignment guidelines
- F. Size: As per manufacturers standard size.
- G. Finish and Texture: Matte, smooth.
- H. Color: As selected by Architect from Manufacturers full range.

2.4 SELF ADHERING FLASHING

- A. Self-Adhering, Plastomeric-Modified Bitumen Sheet:
 - 1. Basis of Design Product: Polychloroethylene (PCE) Membrane, ember resistant underlayment as manufactured by Polyglass a unit of Mapei group, web: www.polyglass.com
 - 2. Thickness: 63 mils
 - 3. Roll Size: As per manufacturers standard size.
 - 4. Fire Rating: Class A

2.5 UNDERLAYMENT MATERIAL

- A. Basis of Design Product: 30# Asphalt-Saturated Organic Roofing Felt, complying with ASTM D226 Type II.
- B. Application: One layer, mechanically fastened over self-adhered underlayment.

2.6 FIRE RESISTANT SHEET

- A. Basis of Design Product: GAF VersaShield® Fire-Resistant Roof Deck Protection as manufactured by GAF, complying with ASTM D1970.
- B. Thickness: 40mils.

2.7 SOFFIT AND RIDGE VENTS

- A. Continuous Intumescent Soffit and Ridge Vent: Provides airflow with fire-blocking intumescent material.
- B. Basis of Design Manufacturer: Vulcan Vents, web: www.vulcanvents.com.
- C. Fire Rating: Pass as per ASTM E84.
- D. Ridge Vents:
 - 1. Net Free Vent Area: Minimum 18 sq. in. per linear foot.
- E. Soffit Vents:
 - 1. Net Free Vent Area: Minimum 10 sq. in. per linear foot.

2.8 FASTENERS

- A. Roofing Nails: ASTM F1667, hot-dip galvanized-steel, 0.120-inch- (3.05-mm-) diameter shank, sharp-pointed, conventional roofing nails with barbed shanks; minimum 3/8-inch- (10-mm-) diameter head; of sufficient length to penetrate 3/4 inch (19 mm) into substrate or extend at least 1/8 inch (3 mm) through thickness of the sheathing, whichever is less.
 - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

- B. Underlayment Nails: Aluminum, stainless steel, or hot-dip galvanized-steel wire nails with low-profile metal or plastic caps, 1-inch- (25-mm-) minimum diameter.
 - 1. Provide with minimum 0.0134-inch- (0.34-mm-) thick metal cap, 0.010-inch- (0.25-mm-) thick power-driven metal cap, or 0.035-inch- (0.89-mm-) thick plastic cap; and with minimum 0.083-inch- (2.11-mm-) thick ring shank or 0.091-inch- (2.31-mm-) thick smooth shank of length to penetrate at least 3/4 inch (19 mm) into roof sheathing or to penetrate through roof sheathing less than 3/4 inch (19 mm) thick.
- C. Nails for Wood Nailers: ASTM F1667; common or box, steel wire, flat head, and smooth shank.

2.9 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 07 62 00 "Sheet Metal Flashing and Trim."
 - 1. Sheet Metal: Stainless steel.
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for design, dimensions, metal, and other characteristics of the item unless otherwise specified in this Section or indicated on Drawings.
 - 1. Channel Flashings: Fabricate with vertical surface extending a minimum of 4 inches (102 mm) above the roof tile and 6 inches (152 mm) beneath the tile roofing, with a 1-inch- (25-mm-) high vertical return to form a runoff channel.
 - 2. Cricket and Backer Flashings: Fabricate with concealed flange extending a minimum of 24 inches (610 mm) beneath upslope tile roofing, 6 inches (152 mm) beyond each side of pipe penetration and 6 inches (152 mm) above the roof plane.
 - 3. Counterflashings: Fabricate to cover 4 inches (102 mm) of base flashing measured vertically; and in lengths required so that no step exceeds 8 inches (203 mm) and overall length is no more than 10 feet (3 m).
 - a. Provide metal reglets for installation.
 - 4. Valley Flashings: Fabricate from metal sheet not less than 24 inches (610 mm) wide in lengths not exceeding 10 feet (3 m), with 1-inch- (25-mm-) high, inverted-V profile water diverter at center of valley and equal flange widths of not less than 11 inches (279 mm).
 - a. Hem flange edges for fastening with metal cleats.
 - 5. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m), with minimum 2-inch (51-mm) roof-deck flange and 1-1/2-inch (38-mm) fascia flange with 3/8-inch (10-mm) drip at lower edge.
- C. Sheet Metal Ridge Vent: Fabricate from 16-oz./sq. ft.- (0.55-mm-) thick copper sheet, terminating each side in V-shaped external baffles with venting holes producing net free ventilation area of 2.65 sq. in./ft. (56 sq. cm/m).
- D. Vent-Pipe Flashings: ASTM B749, Type L51121, at least 1/16 inch (1.6 mm) thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches (102 mm) from pipe onto roof.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored and that provisions have been made for flashings and penetrations through roofing.
3. Verify that vent stacks and other penetrations through roofing are installed and securely fastened.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF ROOF TILES

A. Install roof tiles as per manufacturer's written information.

B. Start at eaves and work upward, maintaining consistent exposure and coursing.

C. Secure tiles with recommended fasteners through pre-molded holes.

D. Install hip and ridge tiles using manufacturer-supplied components.

E. Coordinate with ridge vent installation for continuous ventilation.

F. Remove and replace damaged or broken clay roof tiles.

3.3 INSTALLATION OF UNDERLAYMENT MATERIALS

A. Install self adhering flashing, underlayment and fire resistive slip sheet as per manufacturers written information.

B. Felt: Install parallel with and starting at eaves and fasten with underlayment nails.

1. Single-Layer Installation: Install on roof deck.

a. Lap sides a minimum of 4 inches (102 mm) over underlying course.

b. Lap ends a minimum of 4 inches (102 mm).

c. Stagger end laps between succeeding courses at least 72 inches (1829 mm).

2. Top-Layer Installation: Install as second layer over anchor-layer underlayment, with side laps offset halfway between side laps of underlying anchor layer.

a. Lap sides a minimum of 4 inches (102 mm) over underlying course.

b. Lap ends a minimum of 4 inches (102 mm).

c. Stagger end laps between succeeding courses at least 72 inches (1829 mm).

3.4 INSTALLATION OF INTUMESCENT RIDGE AND SOFFIT VENTS

A. Install continuous intumescent ridge and soffit vents in accordance with manufacturer's instructions.

B. Ensure free airflow from soffit to ridge; do not block with insulation or underlayment.

C. Integrate with tile and flashing for watertight assembly.

3.5 INSTALLATION OF METAL FLASHING AND TRIM

- A. Install metal flashings and other sheet metal to comply with requirements in Section 07 62 00 "Sheet Metal Flashing and Trim."
- B. Cricket and Backer Flashings: Install against roof-penetrating elements, extending concealed flange beneath upslope tile roofing and beyond each side.
- C. Channel Flashings: Install over underlayment materials and fasten to roof deck.
- D. Counterflashings: Coordinate with installation of base flashing and fit tightly to base flashing. Lap joints a minimum of 4 inches (102 mm) secured in a waterproof manner.
 - 1. Install in reglets or receivers.
- E. Valley Flashings: Install centered in valleys, lapping ends at least 8 inches (203 mm) in direction that sheds water. Fasten upper end of each length to roof deck beneath overlap.
 - 1. Adhere minimum 9-inch- (229-mm-) wide strips of self-adhering, polymer-modified bitumen sheet to metal flanges and to underlying self-adhering, polymer-modified bitumen sheet. Place strips parallel to and over flanges so that they will be just concealed by installed tile.
 - 2. Provide a closure at the end of the inverted-V profile of the valley metal to minimize water and ice infiltration.
- F. Rake Drip Edges: Install over underlayment materials and fasten to roof deck.
- G. Eave Drip Edges: Install below underlayment materials and fasten to roof deck.
- H. Sheet Metal Ridge Vents: Install centered on and mechanically fasten to wood ridge. Adhere each side to clay roof tile with elastomeric sealant.
 - 1. Install fabric mesh over roof-deck air ventilation gaps to prevent insect entry.
- I. Pipe Flashings: Form flashing around pipe penetrations and tile roofing. Fasten and seal to tile roofing.

3.6 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS _____ of _____ herein called the "Roofing Installer," has performed roofing and associated work ("the work") on the following project:
 - 1. Owner:
 - 2. Owner Address:
 - 3. Building Name/Type:
 - 4. Building Address:
 - 5. Area of the Work:
 - 6. Acceptance Date:
 - 7. Warranty Period:
 - 8. Expiration Date:
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant the work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that, during Warranty Period, Roofing Installer will, at Roofing Installer's own cost and

expense, make or cause to be made such repairs to or replacements of the work as are necessary to correct faulty and defective work and as are necessary to maintain the work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to the work and other parts of the building, and to building contents, caused by:
 - a. Lightning;
 - b. Peak gust wind speed exceeding:
 - c. Fire;
 - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. Faulty construction of copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. Vapor condensation on bottom of roofing; and
 - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When the work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to the work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of the work.
4. During Warranty Period, if Owner allows alteration of the work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of the alterations, but only to the extent the alterations affect the work covered by this Warranty. If Owner engages Roofing Installer to perform the alterations, Warranty shall not become null and void unless Roofing Installer, before starting the alterations, notified Owner in writing, showing reasonable cause for claim, that the alterations would likely damage or deteriorate the work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a use or service more severe than originally specified, this Warranty shall become null and void on date of the change, but only to the extent the change affects the work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect the work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on the work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of the work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____ month of _____ year.

1. Authorized Signature:
2. Name:

3. Title:

END OF SECTION 07 32 00

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SECTION 07 41 13.13 - FORMED METAL ROOF PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Preformed metal roof panels.

1.2 COORDINATION

- A. Coordinate metal roof panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal roof panel Installer, metal roof panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal roof panels.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal roof panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review structural loading limitations of supporting structure during and after roofing.
 - 6. Review flashings, special details, drainage, and condition of other construction that affect metal roof panels.
 - 7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 8. Review temporary protection requirements for metal roof panel systems during and after installation.
 - 9. Review procedures for repair of metal roof panels damaged after installation.
 - 10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Shop Drawings:

1. Include fabrication and installation layouts of metal roof panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Initial Selection: Manufacturer's standard color charts, showing full range of available colors for each type of exposed finish.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish for metal roof panels, clips, fasteners, closures, and other metal panel accessories.

1. Size: Manufacturers' standard size.

1.5 INFORMATIONAL SUBMITTALS

A. Certificates for portable roll-forming equipment.

B. Product Test Reports: For formed metal roof panels, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Qualification Statements: For roof installers.

E. Sample warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal roof panels.

1.7 QUALITY ASSURANCE

A. Roof Installer Qualifications: An entity that employs installers and supervisors who have a minimum of 3 years' experience in the installation of metal roof / wall panels.

1.8 MOCKUPS

A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockup of typical roof area and eave as shown on Drawings; approximately 48 inches (1200 mm) square by full thickness, including attachments, underlayment, and accessories.

2. Build mockups for typical roof area only..

- a. Size: 12 ft. (3.5 m) long by 6 ft. (1.75 m).

- b. Each type of exposed seam and seam termination.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations in by Change Order.

4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal roof panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness, with positive slope for drainage of water. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal roof panels during installation.

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal roof panels to be performed in accordance with manufacturers' written installation instructions and warranty requirements.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of metal roof panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal roof panel systems capable of withstanding the effects of the following loads when tested in accordance with ASTM E1592:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- B. Air Infiltration: Air leakage of not more than 0.04 cfm/sq. ft. (0.2 L/s per sq. m) when tested in accordance with ASTM E1680 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).
- C. Water Penetration under Static Pressure: No water penetration when tested in accordance with ASTM E1646 at the following test-pressure difference:
 1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).
- D. Watertightness: No water penetration when tested in accordance with ASTM E2140 for hydrostatic-head resistance.
- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
- F. FM Approvals Listing: Provide metal roof panels and component materials that comply with requirements in FM Approvals 4471 as part of a metal panel roofing system and that are listed in FM's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals markings.
- G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- H. Energy Performance:
 1. Provide metal roof panels meeting one of the following requirements when tested in accordance with CRRC-1:
 - a. Three-year, aged solar reflectance of not less than 0.55 and emissivity of not less than 0.75.
 - b. Three-year, aged Solar Reflectance Index (SRI) of not less than 64 when calculated in accordance with ASTM E1980.

2.2 PREFORMED METAL ROOF PANEL

- A. Basis of Desing Product: 7/8" corrugated profile panels as manufactured by Western States Decking, web: www.westernstatesmetalroofing.com.
- B. Material: Metallic-coated steel sheet.
- C. Physical Properties:
 1. Thickness: 24 gauge.
 2. Panel Size: As per manufacturer standard size.
 3. Continuous Rib Spacing: 2.67" inch on center.
 4. Finish and Color: AS indicated on Drawings.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C645; cold-formed, metallic-coated steel sheet, minimum ASTM A653/A653M, G90 (Z275) hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal roof panel system.
- B. Roof Panel Accessories: Provide components required for a complete, weathertight roof panel system, including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants,

gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal roof panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.
- D. Roof Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Roof Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
 2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer.
 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 FABRICATION

- A. Fabricate and finish metal roof panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal roof panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate in accordance with equipment manufacturer's written instructions and to comply with details shown.
- C. Provide roof panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal roof panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations that apply to design, dimensions, metal, and other characteristics of item indicated.
1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with manufacturer's recommendations.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal roof panel manufacturer.
 - a. Size: As recommended by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Roof Panels and Accessories:
 1. Two-Coat Fluoropolymer: Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.
 1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
 2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages in accordance with ASTM C754 and metal roof panel manufacturer's written recommendations.

3.3 INSTALLATION OF FORMED METAL ROOF PANELS

- A. Install metal roof panels in accordance with manufacturer's written instructions in orientation, sizes, and locations indicated. Anchor metal roof panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal roof panels.
2. Flash and seal metal roof panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that are concealed by metal roof panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal roof panel Work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal roof panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

- B. Fasteners:

1. Steel Roof Panels: Use stainless steel fasteners for surfaces exposed to exterior; use galvanized-steel fasteners for surfaces exposed to interior.

- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal roof panel manufacturer.

- D. Exposed-Fastener, Metal Roof Panels: Fasten metal roof panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal roof panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
5. Flash and seal panels with weather closures at perimeter of all openings.

- E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel system, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

Provide types indicated by metal roof panel manufacturer; or, if not indicated, provide types recommended in writing by metal roof panel manufacturer.

- F. Flashing and Trim: Comply with performance requirements and manufacturer's written installation instructions. Provide concealed fasteners where possible and set units true to line and level. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that are without buckling and tool marks, and that are true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 ft. (3 m), with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal roof panel units within installed tolerance of 1/4 inch in 20 ft. (6 mm in 6 m) on slope and location lines and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 41 13.13

SECTION 07 62 00 -

SHEET METAL FLASHING AND TRIM

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 exterior sheet metal flashing and trim:
 - 1. Wall Flashing and Sheet Metal Fabrications.
 - 2. Opening Flashing.
 - 3. Formed Steep Slope Roof Sheet Metal Fabrications.
 - 4. Prefabricated Facility Services Utility Penetration Flashings
 - 5. Gutters and Downspouts.
 - 6. Other Components.

1.3 RELATED REQUIREMENTS

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Pertinent Sections specifying Sustainable Design Requirements.
- C. Pertinent sections specifying roofing, waterproofing, exterior cladding and finish assemblies, curtainwall, windows, doors and façade openings requiring flashing.
- D. Section 07 25 00 "Weather Barriers" .
- E. Pertinent sections specifying steep-slope roofing.
- F. Section 07 92 00 "Joint Sealants" for façade cladding sealants.
- G. references
- H. Codes and Construction Industry Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
 - 1. Comply with the provisions and requirements of the documents referenced in this Section.
 - 2. References are to current editions of documents unless earlier editions are specifically referenced by the governing code or are otherwise indicated.

1.4 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
 - 3. Review requirements for insurance and certificates if applicable.
 - 4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.6 SUBMITTALS

- A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.
- B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
 - 1. Include manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.
 - 2. Metal material characteristics and installation recommendations.
 - 3. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specific can be approved
 - 4. Provide approval letters from metal manufacturer for use of their metal within this particular roofing system type.
- C. Shop Drawings: For each item required:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Detail formed flashing and trim at scale of not less than 1-1/2 inches (38 mm) per 12 inches (304.8 mm) (1:10).
 - 3. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
 - 4. Include identification of material, thickness, weight, and finish for each item and location in Project.
 - 5. Include details for forming, including profiles, shapes, seams, and dimensions.
 - 6. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 7. Include details of termination points and assemblies.
 - 8. Include details of special conditions.
 - 9. Include details of connections to adjoining work.
 - 10. Include details of roof-penetration flashing.
 - 11. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
- D. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

- E. Samples for Verification: For each type of exposed finish. Provide complete with specified factory finish. Where finish involves normal color and texture variations, include Sample sets composed of 2 or more units showing the full range of variations expected.
 - 1. 8-inch- (200-mm-) square Samples of specified sheet materials to be exposed as finished surfaces.
 - 2. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 - 3. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
 - 4. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
 - 5. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Product Certificates: For each type of coping and roof edge flashing that is ANSI/SPRI/FM 4435/ES-1 tested .
- C. Evaluation Reports: For copings and roof edge flashing, from ICC-ES showing compliance with ANSI/SPRI/FM 4435/ES-1.
- D. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- E. Sample Warranty: For special warranty.
- F. Certification – Roofing Sheet Metal:
 - 1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.
 - 2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.9 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - 1. Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a minimum 5 year fabrication and installation record of successful in-service performance.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 - 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 - 2. Protect stored sheet metal flashing and trim from contact with water.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.11 WARRANTY

- A. Contractor's Warranty: Provide notarized written warranty assuring that all sheet metal work including caulking and fasteners to be water-tight and secure for a period of five years from the date of final acceptance of the building. Warranty shall include all materials and labor required to repair leaks that develop, and repair damage to other work or equipment caused by such leaks or the repairs thereof.
- B. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

1.12 PROJECT CONDITIONS

- A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC Limits for adhesives sealants, fillers and primers. Comply with limits specified in related Section.
- B. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
 - 1. Fabricate and install roof-related flashings to comply with requirements specified in the related sections specifying roofing.
- C. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:
 - 1. Design Pressure: As indicated on Drawings.
- D. Sheet Metal Standard for other Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

2.2 SHEET METAL MATERIALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Prefinished Aluminum-Zinc Alloy-Coated Steel Sheet: Provide aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation, Grade 40 (Grade 275); pre-painted by coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Surface: Smooth, flat.
 - 2. Exposed Coil-Coated Finish:
 - a. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 3. Color: Dark bronze
- C. Stainless-Steel Sheet: ASTM A666, Type 304, dead soft, fully annealed; with smooth, flat surface, except where harder temper is required for forming or performance; minimum 0.03125 inch (0.79 mm) thick, and thicker where required by referenced standards or otherwise specifically indicated.
 - 1. Finish: No. 4 (polished directional satin).

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing or flashing. Provide primer according to written recommendations of underlayment manufacturer.
 - 1. Thermal Stability: ASTM D1970; stable after testing at 240 deg F or higher.
 - 2. Low-Temperature Flexibility: ASTM D1970; passes after testing at minus 20 deg F or lower.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 - 3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- C. Solder:

1. For Stainless Steel: ASTM B32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.
 2. For Aluminum-Zinc Alloy-Coated Steel: ASTM B32 grade 50A, with maximum lead content of 0.2 percent. Name of product manufacturer and grade designation stamped or cast onto each bar.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Elastomeric Sealant: ASTM C920, silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight, recommended by sheet metal manufacturer and fabricator of components being sealed, complying with requirements specified in Division 07 Section "Exterior Façade Sealants."
- F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.
- H. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive and non-galvanic; size and thickness required for performance.

2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements and as recommended by cited standards, but not less than that specified for each application and metal.
 2. Obtain field measurements for accurate fit before shop fabrication.
 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
 5. Provide work resulting in waterproof and weather-resistant performance once installed.
- B. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.
- C. Fabricate curved, "vaulted" or radiused sheet metal items and joinery by machine-rolling true to dimensioned radius. Do not field bend or "walk-down".
1. Roll, cut and weld material to create smooth surfaces and transitions for custom factory finishing.
 2. Provide true curves and joinery utilizing "Pittsburgh lock" construction, minimizing joints.
 3. Segmented fabrication or "faceted" elements composed of straight pieces are not acceptable unless specifically noted and dimensioned on drawings.

- D. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- E. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- F. Sealant Joints: Where movable, non-expansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured, from same material as accessory being anchored or from compatible, noncorrosive metal.
 - 1. Exception: Cleats (hook strips) for fascias shall be at least one gauge heavier than the fascia metal
- H. Seams:
 - 1. Soldered Sheet Metal: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 2. Metals with Painted, Coated, or Lacquered Finishes: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- I. Do not use graphite pencils to mark metal surfaces.

2.6 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Flashing not otherwise specified: Fabricate from the following materials in minimum thickness or weight indicated and greater as required to comply with cited standards.:
 - 1. Stainless Steel: 0.025 inch (0.64 mm) thick.

2.7 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters:
 - 1. Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required.
 - 2. Fabricate in minimum 96-inch- (2400-mm-) long sections.
 - 3. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard, but with thickness not less than twice the gutter thickness.
 - 4. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
 - 5. Gutter Profile: As indicated on Drawings and in accordance with cited sheet metal standard.
 - 6. Expansion Joints: Butt type with cover plate.
 - 7. Accessories: Wire-ball downspout strainer.
 - 8. Gutters with Girth up to 15 Inches (380 mm): Fabricate from one of the following materials:
 - a. Prefinished Aluminum-Zinc Alloy-Coated Steel: 0.022 inch (0.56 mm) thick in selected color.
 - 9. Gutters with Girth 16 to 20 Inches (410 to 510 mm): Fabricate from the following materials:

- a. Prefinished Aluminum-Zinc Alloy-Coated Steel: 0.028 inch (0.71 mm) thick in selected color.
10. Accessories:
 - a. Gutter Screens:
 - 1) Basis of Design Product: Gutter guards, as manufactured by GBT Sheet Metal, Web: www.gbtsheetmetal.com.
 - 2) Material: As per manufacturer standard.
 - 3) Finish: Powder coated.
 - B. Downspouts: Fabricate downspouts to dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.
 1. Fabricated Hanger Style: As indicated on Drawings and in accordance with SMACNA's "Architectural Sheet Metal Manual."
 2. Fabricate from the following materials:
 - a. Same materials and finish as gutters; 0.028 inch (0.71 mm)

2.8 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Cricket, and Backer Flashing: Fabricate from the following materials:
 1. Stainless Steel: 0.03125 inch thick.
- B. Valley Flashing: Fabricate from the following materials:
 1. Stainless Steel: 0.03125 inch thick.
- C. Drip Edges: Fabricate from the following materials:
 1. Stainless Steel: 0.03125 inch thick.
- D. Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:
 1. Stainless Steel: 0.03125 inch thick.
- E. Counterflashing: Fabricate from the following materials:
 1. Stainless Steel: 0.03125 inch thick.
- F. Flashing Receivers: Fabricate from the following materials:
 1. Stainless Steel: 0.03125 inch thick.
- G. Roof-Penetration Flashing: Fabricate from the following materials:
 1. Stainless Steel: 0.03125 inch thick.

2.9 WALL SHEET METAL FLASHING

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96 inch (2400 mm) long, but not exceeding 12 foot (3.6 m) long, sections, under copings, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches (150 mm) beyond each side of wall openings. Form with 2 inch (50 mm) high, end dams. Fabricate from the following materials:
 1. Stainless Steel: 0.016 inch (0.40 mm) thick.

- B. Opening Flashings in Frame Construction: Provide at all openings in exterior walls. Fabricate head, sill, and similar flashings to extend 4 inches (100 mm) beyond wall openings. Form head and sill flashing with 2-inch- (50-mm-) high, end dams. Fabricate from the following materials:
 - 1. The thickness/weights below roughly correspond to 28 gauge.
 - 2. Stainless Steel: 0.016 inch (0.40 mm) thick.

2.10 UTILITY WALL PENETRATION FLASHINGS

- A. Prefabricated Facility Services Utility Penetration Flashings, sizes and profiles required to suit conditions.
- B. Manufacturer: TBD
- C. Plumbing Flashing Panels:
 - 1. Panel Materials: Combination of high-density polyethylene (HDPE) and low-density polyethylene (LDPE).
 - a. HDPE, Specific Gravity, ASTM D1505: 0.953 g/cm³.
 - b. HDPE, Tensile Strength at Yield, ASTM D638: 3,100 psi.
 - c. LDPE, Specific Gravity, ASTM D792: 0.917 g/cm³.
 - d. LDPE, Tensile Strength at Yield, ASTM D638: 1,300 psi.
 - 2. Weatherproof Seal Materials: Thermoplastic elastomer.
 - a. Hardness, ASTM D2240, Shore A, 10 Seconds: 46.
 - b. Specific Gravity, ASTM D792: 1.05 g/cm³.
 - c. Tensile Strength, ASTM D412: 490 psi.
- D. Electrical Flashing Panels:
 - 1. Material: Thermoplastic elastomer.
 - a. Hardness, ASTM D2240, Shore A, 10 Seconds: 93.
 - b. Specific Gravity, ASTM D792: 1.05 g/cm³.
 - c. Tensile Strength, ASTM D412: 1,300 psi.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets are in place, and nailing strips located.
- D. Verify membrane termination and base flashings are in place, sealed, and secure.

- E. Beginning of installation means acceptance of existing conditions.
- F. Field measure site conditions prior to fabricating work.

3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering, High-Temperature Sheet Underlayment:
 - 1. Install self-adhering, high-temperature sheet underlayment; wrinkle free.
 - 2. Prime substrate if recommended by underlayment manufacturer.
 - 3. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures.
 - 4. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses.
 - 5. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller.
 - 6. Roll laps and edges with resilient vinyl roller.
 - 7. Cover underlayment within 14 days.
- B. Apply slip sheet, wrinkle free, over underlayment before installing sheet metal flashing and trim.
 - 1. Install in shingle fashion to shed water.
 - 2. Lap joints not less than 4 inches (100 mm).

3.3 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
- B. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install continuous cleats with fasteners spaced not more than 12 inches (300 mm) o.c.
 - 3. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 - 5. Torch cutting of sheet metal flashing and trim is not permitted.
 - 6. Do not use graphite pencils to mark metal surfaces.
- C. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
 - 1. Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet of red-rosin paper.

- D. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- E. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
 - 1. Wood Blocking or Sheathing: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws
- F. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- G. Seal joints as required for watertight construction.
 - 1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 - 2. Prepare joints and apply sealants to comply with requirements in Section specifying Joint Sealants.
- H. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
 - 1. Do not solder metallic-coated steel and aluminum sheet. Use joint adhesive for nonmoving joints specified not to be soldered.
 - 2. Do not use torches for soldering.
 - 3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
 - 4. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
 - 5. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.
- I. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.

3.4 MISCELLANEOUS FLASHING INSTALLATION

- A. Overhead-Piping Safety Pans: Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.
- B. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.5 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to produce complete roof-drainage system and to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels,

and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

- B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant unless otherwise indicated.
- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric or butyl sealant compatible with roof membrane and clamp flashing to pipes that penetrate roof.

3.6 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard and drawing details. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Through-Wall Flashing: Installation of through-wall flashing is specified in related section specifying exterior wall cladding.
- C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings as detailed on drawings and to extend 4 inches (100 mm) Insert dimension beyond wall openings.
- D. Utility Wall Penetration Flashing: Select prefabricated facility services utility penetration flashing sizes and profiles required to suit conditions.
 - 1. Install in accordance with manufacturer's recommendations, properly lapped with weather resistive barrier and related flashing and finishes to shed water to the building exterior.

E. INSTALLATION TOLERANCES

- F. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8 inch (3 mm) offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

- F. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION 07 62 00

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SECTION 07 84 13 –

PENETRATION FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Penetration firestopping systems.
2. Penetrations in fire-resistance-rated walls.
3. Penetrations in horizontal assemblies.

B. Related Requirements:

1. Section 03 30 00 "Cast-In-Place Concrete"
2. Section 09 29 00 "Gypsum Board"
3. Section 07 92 00 "Joint Sealants" for non-fire-resistance-rated joint sealants.
4. Division 22 Plumbing
5. Division 23 Heating, Ventilating and Air Conditioning (HVAC)
6. Division 26 Electrical

1.2 PREINSTALLATION MEETINGS

- #### A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

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

- #### B. Unlisted Firestopping Systems: Obtain an Engineering Judgment (EJ) from firestopping manufacturer where no UL, FM Approvals, or other listed assembly is available for particular firestop configuration. Follow International Firestop Council (IFC) recommended guidelines for evaluating firestopping systems in EJs.

- #### C. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly developed in accordance with current International Firestop Council (IFC) guidelines. Obtain approval of authorities having jurisdiction prior to submittal.

1.4 INFORMATIONAL SUBMITTALS

- #### A. Qualification Data: For Installer.

- #### B. Listed System Designs: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Entity that has been approved by FM Approvals in accordance with FM Approvals 4991 or been evaluated by UL and found to comply with UL's "UL Solutions Qualified Firestop Contractor Program."
- B. Manufacturer Qualifications: Entity that has received UL's "Firestop Movement Certification," which demonstrates that manufacturer's firestopping products designated with M-Ratings are based on exposure to cyclic movement and UL 1479 fire test evaluation when tested in accordance with ASTM E3037.

1.7 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Build mockup of each penetration firestopping system type required for Project, including supporting construction substrates, attachments, and accessories.
 - 2. Where one penetration firestopping system type may be used for different penetrating items or in different wall or floor constructions, install one assembly for each different combination.
 - 3. Obtain approval of mockups from authorities having jurisdiction before proceeding.
 - 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
 - 5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping systems when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping system materials in accordance with manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be accessed and installed in accordance with specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain penetration firestopping systems for each type of opening indicated from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
1. A qualified testing agency, acceptable to authorities having jurisdiction, will perform penetration firestopping system tests.
 2. Test in accordance with testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping systems installed with products bearing the classification marking of a qualified testing agency.
 - 1) UL in its online directory "Product iQ."
 - 2) Intertek Group in its "Directory of Building Products."
 - 3) FM Approvals in its "Approval Guide."
- B. Provide components for each penetration firestopping system that, upon curing, do not re-emulsify, dissolve, leach, break down, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water, or other forms of moisture characteristic during and after construction.
- C. Provide components for each penetration firestopping system that do not contain ethylene glycol.
- D. Provide components for each penetration firestopping system that are sufficiently flexible to accommodate movement, such as pipe vibration, water hammer, thermal expansion, and other normal building movement without damage.
- E. Provide components for each penetration firestopping system that are appropriately tested for the thickness and type of insulation utilized.

2.3 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems must be compatible with one another, with the substrates forming openings, and with penetrating items if any.
1. Acceptable Manufacturers:
 - a. Hilti Corporation
 - b. Specified Technologies Inc. (STI)
 - c. 3M Corporation
 - d. Or Approved Equal
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined in accordance with ASTM E814 or UL 1479.
1. F-Rating: Not less than the fire-resistance rating of the wall penetrated.
 2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined in accordance with ASTM E814 or UL 1479.
1. F-Rating: At least one hour, but not less than the fire-resistance rating of the floor penetrated.
 2. T-Rating: At least one hour, but not less than the fire-resistance rating of the floor. The following floor penetrations do not require a T-rating:
 - a. Those within the cavity of a wall.

- b. Floor, tub, or shower drains within a concealed space.
 - c. 4-inch (200-mm) or smaller metal conduit penetrating directly into metal-enclosed electrical switchgear.
3. W-Rating: Provide penetration firestopping systems with a Class 1 W-rating in accordance with UL 1479.

2.4 ACCESSORIES

- A. 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, including but not limited to:
1. Permanent forming/damming/backing materials.
 2. Substrate primers.
 3. Collars.
 4. Steel sleeves.

2.5 FILL MATERIALS

- A. General:
1. All sealants under this section to state smoke, gas and water resistant, for use at horizontal and vertical assemblies.
 2. All product names on this list should say Firestop.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestopping Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Wrap Strips: Single-component intumescent elastomeric strips for use around combustible penetrants.
- F. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- G. Pillows/Bags: Compressible, removable, and reusable intumescent pillows encased in fire-retardant polyester or glass-fiber cloth. Where exposed, and when required by a listed system, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed or dislodged.
- H. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- I. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.
- J. Thermal and Endothermic Wraps: Flexible, insulating, and fire-resistant protective wraps tested and listed for up to 2-hour fire ratings in accordance with ASTM E814 or UL 1479; for protecting membrane penetrations of utility boxes, critical electrical circuits, communications lines, and fuel lines, and for thermal barrier and circuit integrity protection in accordance with ASTM E1725 or UL 1724.

- K. Fire-Rated Cable Sleeve Kits: Complete kits designed for new or existing cable penetrations through walls which accept standard accessories.
- L. Fire-Rated Cable Pathways: Single or gangable device modules composed of a steel raceway with integral intumescent material and requiring no additional action in the form of plugs, twisting closure, putty, pillows, sealant, or otherwise to achieve fire and air-leakage ratings.
 - 1. Fire-rated cable pathway devices are the preferred product for data, video, and communications cable penetrations. Install these devices in locations where frequent cable moves, add-ons, and changes will occur. Such devices must be:
 - a. Capable of retrofit around existing cables.
 - b. Designed so that two or more devices can be ganged together.
 - c. Maintenance-free so no action is required to activate the smoke- and fire-sealing mechanism.
 - 2. Where fire-rated cable pathway devices are not practical, openings within walls and floors designed to accommodate data, video, and communications cabling must be provided with re-enterable products specifically designed for retrofit, such as retrofit devices for cable bundles, firestopping putty, plugs, or pillows.
- M. Retrofit Device for Cable Bundles: Factory-made, intumescent, collar-like device for firestopping existing over-filled cable sleeves and capable of being installed around projecting sleeves and cable bundles.
- N. Wall-Opening Protective Materials: Intumescent, non-curing putty pads or self-adhesive inserts for protection of electrical switch and receptacle boxes.
- O. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestopping gasket for use around rectangular steel HVAC ducts without fire dampers.
- P. Firestopping Plugs: Flexible, re-enterable, intumescent, foam-rubber plug for use in blank round openings and cable sleeves.
- Q. Fire-Rated Cable Grommet: Molded two-piece grommet made of plenum-grade polymer and foam inner core for sealing small cable penetrations in gypsum walls up to 1/2 inch (13 mm) in diameter.
- R. Closet Flange Gasket: Molded, single-component, flexible, intumescent gasket for use beneath a water closet (toilet) flange in floor applications.
- S. Supplemental Material: Provide supplementary materials required to complete, fire rated installation.

2.6 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings in accordance with manufacturer's written instructions and with the following requirements:
 - 1. Remove foreign materials from substrate surfaces that could interfere with adhesion of penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates in accordance with penetration firestopping system manufacturer's written installation instructions, using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install penetration firestopping systems in accordance with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items to achieve required fire-resistance ratings.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
- D. Dam Construction:
 - 1. Install dams when required to properly contain fire stopping materials within openings and as required to achieve fire resistance rating as tested and rated.
 - 2. Provide in conformance with installation requirements for type of floor, wall, and partition construction, and as recommended by fire stop manufacturer.
 - 3. Combustible damming material shall be removed after appropriate curing. Noncombustible damming material may be left as a permanent component of the fire stop system.
 - 4. Placement of dams shall not interfere with function, or adversely affect the appearance, of adjacent construction.
- E. Installation of Single Component Fire Stop Sealant:
 - 1. Provide noncombustible insulation as required to achieve fire resistance rating.
 - 2. Install with manual or powered sealant gun. For up to four-hour rating, install to the thickness required by the Listed System Designs as directed for wall and floor applications.
 - 3. Surface of gun grade fire stop sealant shall be tooled in accordance with manufacturer's recommendations.

4. Remove excess materials from adjacent surfaces within 10 minutes, with either water or other material compatible with sealant and recommended by sealant manufacturer, leaving the Work in a neat, clean condition.

F. Installation of Cementitious Fire Stop Mortar:

1. Mixing: Add dry powder to water and mix with mechanical mixer or hand mixing tools. Ratio and duration of mix shall be as instructed by fire stop mortar manufacturer. Average wet density of mortar shall be 70 pounds per cubic foot (plus or minus 5).
2. Wet surfaces before installation of fire stop mortar. Mortar may be hand installed or pumped into the opening.
3. When installing around layered and grouped cables, vibrate or move the cables slightly to prevent voids from forming between the cables.
4. Exposed surfaces shall be finished with conventional plastering tools before curing.
5. Allow at least 48 hours for initial cure before form removal. For full cure allow 28 days.

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 (76 mm) high and with minimum 0.375-inch (9.5-mm) strokes.

1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 ft. (4.57 m) from end of wall and at intervals not exceeding 30 ft. (9.14 m).

- B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Owner will engage a qualified independent inspection agency to inspect through-penetration firestop system in accordance with ASTM E2174, or joint system in accordance with ASTM E2393. Manufacturer representatives shall not perform inspections of installed firestopping systems.

- B. Inspector of Record shall be present to observe special testing and inspections as required by the approved TIO.

- C. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.

- D. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 84 13

SECTION 07 92 00 - JOINT SEALANTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Silicone joint sealants.

- B. Samples for Initial Selection: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

- C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

- D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- A. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:

1. Joint-sealant location and designation.
2. Manufacturer and product name.
3. Type of substrate material.
4. Proposed test.
5. Number of samples required.

- B. Preconstruction Laboratory Test Reports: For each joint sealant and substrate material to be tested from sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
 - C. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
 - D. Field Quality-Control Reports: For field-adhesion-test reports, for each sealant application tested.
 - E. Sample warranties.
- 1.5 CLOSEOUT SUBMITTALS
- A. Manufacturers' special warranties.
 - B. Installer's special warranties.
- 1.6 QUALITY ASSURANCE
- A. Installer Qualifications: Authorized representative who is trained and approved by manufacturer.
 - B. Testing Agency Qualifications: Qualified in accordance with ASTM C1021 to conduct the testing indicated.
- 1.7 MOCKUPS
- A. Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
- 1.8 PRECONSTRUCTION TESTING
- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 1. Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 2. Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 3. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 5. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
 6. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.
 - B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each kind of sealant and joint substrate.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.

4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
5. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.9 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.10 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint sealants from single manufacturer for each sealant type.

2.2 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 50, NT: Single-component, nonsag, RTV sealant, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
 - 1. Basis of Desing Product: Dowsil 795 silicon building sealant, as manufactured by Dow, web: www.dow.com.
 - 2. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers:
 - a. BASF (Sonneborn), www.basfcc.com
 - b. Sika Corporation, Construction Products Division, www.sika.com.
 - c. Pecora, www.pecora.com
 - d. Substitution: As per Division 01

2.4 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants in accordance with requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:

1. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - a. Extent of Testing: Test completed and cured sealant joints as follows:
 - 1) Perform 10 tests for the first 1000 ft. (300 m) of joint length for each kind of sealant and joint substrate.
 - 2) Perform one test for each 1000 ft. (300 m) of joint length thereafter or one test per each floor per elevation.
 - b. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 - c. Inspect tested joints and report on the following:
 - 1) Whether sealants filled joint cavities and are free of voids.
 - 2) Whether sealant dimensions and configurations comply with specified requirements.
 - 3) Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 - d. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 - e. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
2. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

C. Prepare test and inspection reports.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

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SECTION 08 14 00 - WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core five-ply flush wood veneer-faced doors and transom panels for transparent finish.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications"
2. Section 06 4000 "Architectural Woodwork" for wood door frames including 20-minute fire-rated wood door frames.
3. Section 07 92 00 "Joint Sealers"
4. Section 08 71 00 "Door Hardware"
5. Section 08 80 00 "Glazing" for glass view panels in flush wood doors.
6. Section 09 91 23 "Interior Painting" and Section 09 93 00 "Staining and Transparent Finishing" for field finishing doors.

1.2 REFERENCES

- A. Fabricate and install per the Architectural Woodwork Institute (AWI) Guidelines.
- B. Fabricate and install per the Window and Door Manufacturers Association (WDMA).

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Solid-core five-ply flush wood veneer-faced doors and transom panels for transparent finish.

B. Product Data Submittals: For each product, including the following:

1. Door core materials and construction.
2. Door edge construction
3. Door face type and characteristics.
4. Door louvers.
5. Door trim for openings.
6. Door frame construction.
7. Factory-machining criteria.
8. Factory- finishing specifications.

- C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:

1. Door schedule indicating door and frame location, type, size, fire protection rating, and swing.
2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
3. Details of frame for each frame type, including dimensions and profile.
4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
5. Dimensions and locations of blocking for hardware attachment.
6. Dimensions and locations of mortises and holes for hardware.
7. Clearances and undercuts.
8. Requirements for veneer matching.
9. Doors to be factory finished and application requirements.
10. Apply WI Certified Compliance Program label to Shop Drawings.

D. Samples for Initial Selection: For factory-finished doors.

E. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.
2. Polymer edging, in manufacturer's standard colors.
3. Corner sections of doors, approximately 8 by 10 inches (200 by 250 mm), with door faces and edges representing actual materials to be used.
4. Louver blade and frame sections, 6 inches (150 mm) long, for each material and finish specified.
5. Frames for light openings, 6 inches (150 mm) long, for each material, type, and finish required.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For door inspector.

1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1.
2. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4.
3. Submit copy of DHI's Fire and Egress Door Assembly Inspector (FDAI) certificate.

B. Field quality-control reports.

C. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Special warranties.

B. Quality Standard Compliance Certificates: WI Certified Compliance Program certificates.

C. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.7 QUALITY ASSURANCE

- A. Manufacturer's Certification: Licensed participant in WI's Certified Compliance Program.
- B. Fire-Rated Door Inspector Qualifications: Inspector for field quality-control inspections of fire-rated door assemblies complies with qualifications set forth in NFPA 80, Section 5.2.3.1 and the following:
 - 1. DHI's Fire and Egress Door Assembly Inspector (FDAI) certification.
- C. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies complies with qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:
 - 1. DHI's Fire and Egress Door Assembly Inspector (FDAI) certification.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in cardboard cartons, and wrap bundles of doors in plastic sheeting.
- C. Mark each door on bottom rail with opening number used on Shop Drawings.

1.9 FIELD CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.
 - 2. Do not deliver or install doors until building is enclosed and weathertight, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 43 and 70 17 and 50 Insert numbers percent during remainder of construction period.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Delamination of veneer.
 - b. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
 - c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
 - 2. Warranty also includes installation and finishing that may be required due to repair or replacement of defective doors.
 - 3. Warranty Period for Solid-Core Exterior Doors: Two years from date of Substantial Completion.
 - 4. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain flush wood doors indicated to be blueprint matched with paneling from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Wood Door and Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings and temperature-rise limits indicated on Drawings, based on testing at positive pressure in accordance with UL 10C or NFPA 252.
 - 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
 - 2. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
- B. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing in accordance with UL 1784 and installed in compliance with NFPA 105.
- C. All fire rated doors shall be factory glazed and UL labeled.

2.3 FLUSH WOOD DOORS AND FRAMES, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWI/AWMAC/WI's "Architectural Woodwork Standards." ANSI/WDMA I.S. 1A.
 - 1. Provide labels and certificates from WI certification program indicating that doors comply with requirements of grades specified.

2.4 SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS AND TRANSOM PANELS FOR TRANSPARENT FINISH

- A. Interior Doors, Solid-Core Five-Ply Veneer-Faced:
 - 1. Manufacturers and Products: Subject to compliance and requirements, provide the following:
 - a. Brentwood Manufacturing Company
 - b. Masonite Architectural
 - c. Oregon Door
 - d. Or Approved Equal
 - 2. Performance Grade: ANSI/WDMA I.S. 1A Extra Heavy Duty.
 - 3. Performance Grade by Location:
 - a. ANSI/WDMA I.S. 1A Extra Heavy Duty: Classrooms, public toilets, janitor's closets assembly spaces exits.
 - 4. ANSI/WDMA I.S. 1A Quality Grade: Premium.
 - 5. Formaldehyde free.
 - 6. Thickness: 1 ¾ inch.
 - 7. Architectural Woodwork Standards Quality Grade: Premium.
 - 8. Faces: Stain grade 5-ply wood veneer not less than 1/50 inch (0.508 mm) thick.
 - a. Species: Birch, Maple, Red oak or custom to match existing door on campus.
 - b. Cut: Rotary cut.
 - c. Match between Veneer Leaves: Book match.
 - d. Assembly of Veneer Leaves on Door Faces: Running match.

- e. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
 - f. Room Match:
 - 1) Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 10 feet (3 m) or more.
 - 2) Provide door faces of compatible color and grain within each separate room or area of building.
 - g. Transom Match: As indicated.
 - h. Blueprint Match: Where indicated, provide doors with faces produced from same flitches as adjacent wood paneling and arranged to provide blueprint match with wood paneling. Comply with requirements in Section 06 42 16 "Flush Wood Paneling."
 - i. Adhesive: Polyurethane Reactive (PUR)
9. Exposed Vertical and Top Edges: Same species as faces - Architectural Woodwork Standards edge Type A.
- a. Fire-Rated Single Doors: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed vertical edges.
 - b. Fire-Rated Pairs of Doors:
 - 1) Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
 - 2) Provide formed-steel edges and astragals with intumescent seals.
 - a) Finish steel edges and astragals with baked enamel same color as doors.
 - b) Finish steel edges and astragals to match door hardware (locksets or exit devices).
 - c. Mineral-Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
 - 1) Screw-Holding Capability: 550 lbf (2440 N) in accordance with WDMA T.M. 10.
10. Core for Non-Fire-Rated Doors:
- a. ANSI A208.1, Grade LD-2 particleboard.
 - 1) Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
 - a) 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
 - b) 5-inch (125-mm) bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
 - c) 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.
 - 2) Provide doors with glued-wood-stave or WDMA I.S. 10 structural-composite-lumber cores instead of particleboard cores for doors scheduled to receive exit devices in Section 08 71 00 "Door Hardware."
 - b. Glued wood stave.
 - c. WDMA I.S. 10 structural composite lumber.
 - 1) Screw Withdrawal, Door Face: 550 lbf (2440 N).
 - 2) Screw Withdrawal, Vertical Door Edge: 550 lbf (2440 N).
 - d. Either glued wood stave or WDMA I.S. 10 structural composite lumber.
11. Core for Fire-Rated Doors: As required to achieve fire-protection rating indicated on Drawings.

- a. Blocking for Mineral-Core Doors: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated on Drawings as needed to eliminate through-bolting hardware.
 - 1) 5-inch (125-mm) top-rail blocking.
 - 2) 5-inch (125-mm) bottom-rail blocking, in doors indicated to have protection plates.
 - 3) 5-inch (125-mm) midrail blocking, in doors indicated to have armor plates.
 - 4) 4-1/2-by-10-inch (114-by-250-mm) lock blocks, in doors indicated to have exit devices.
12. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated.
 1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 2. Comply with NFPA 80 requirements for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied.
 1. Locate hardware to comply with DHI-WDHS-3.
 2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
 3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
 4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
 5. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
- C. Transom and Side Panels:
 1. Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors.
 2. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
 3. Fabricate door and transom panels with full-width, solid-lumber, rabbeted, meeting rails.
 4. Provide factory-installed spring bolts for concealed attachment into jambs of metal door frames.
- D. Openings: Factory cut and trim openings through doors.
 1. Light Openings: Trim openings with moldings of material and profile indicated.
 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 08 80 00 "Glazing."
 3. Louvers: Factory install louvers in prepared openings.
- E. Exterior Doors: Factory treat exterior doors with water repellent after fabrication has been completed but before factory finishing.
 1. Flash top of outswinging doors with manufacturer's standard metal flashing.

2.6 FACTORY PRIMING

- A. Doors for Opaque Finish: Factory prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Section 09 91 13 "Exterior Painting." Section 09 91 23" Interior Painting."

2.7 FACTORY FINISHING

- A. Comply with referenced quality standard for factory finishing.
 - 1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 2. Finish faces, all four edges, edges of cutouts, and mortises.
 - 3. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors.
- C. Factory finish doors that are indicated on Drawings to receive transparent finish.
- D. Factory finish doors where indicated in schedules or on Drawings as factory finished.
- E. Transparent Finish:
 - 1. Architectural Woodwork Standards Grade: Premium.
 - a. System-5, Varnish, Conversion.
 - b. System-9, UV Curable, Acrylated Epoxy, Polyester or Urethane.
 - c. System-10, UV Curable, Water Based.
 - d. System-11, Polyurethane, Catalyzed.
 - 2. ANSI/WDMA I.S. 1A Grade: Premium.
 - a. TR-4 Conversion Varnish.
 - b. TR-6 Catalyzed Polyurethane.
 - c. TR-8 UV Cured Acrylated Polyester/Urethane.
 - 3. Staining: Factory finish should meet or exceed WDMA TR-6 and AWI 1500 standard.
 - 4. Sheen: Satin.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 8 Door Hardware section.
- B. Install doors and frames to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

- C. Install frames level, plumb, true, and straight.
 - 1. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3.2 mm in 2400 mm).
 - 2. Anchor frames to anchors or blocking built in or directly attached to substrates.
 - a. Secure with countersunk, concealed fasteners and blind nailing.
 - b. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - 1) For factory-finished items, use filler matching finish of items being installed.
 - 3. Install fire-rated doors and frames in accordance with NFPA 80.
 - 4. Install smoke- and draft-control doors in accordance with NFPA 105.

D. Job-Fitted Doors:

- 1. Align and fit doors in frames with uniform clearances and bevels as indicated below.
 - a. Do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors.
- 2. Machine doors for hardware.
- 3. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
- 4. Clearances:
 - a. Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors.
 - b. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.
 - c. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
 - d. Comply with NFPA 80 for fire-rated doors.
- 5. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
- 6. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.

E. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

F. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 FIELD QUALITY CONTROL

A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Inspections:

- 1. Provide inspection of installed Work through WI's Certified Compliance Program, certifying that wood doors and frames, including installation, comply with requirements of AWI/AWMCA/WI's "Architectural Woodwork Standards" for the specified grade.
- 2. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, Section 5.2.
- 3. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.

- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
- E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80 and NFPA 101.

3.4 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 00

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SECTION 08 16 13 –

FIBERGLASS DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fiberglass doors and frames

B. Related Requirements:

1. Section 08 71 00 "Door Hardware" for hardware not specified in this Section.

1.2 PREINSTALLATION MEETINGS

- ###### A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings:

1. Include plans, elevations, sections, hardware, accessories, and details of installation, including anchor, flashing, and sealant installation.

- ###### C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish. Submit manufacturer's door sample composed of door face sheet, core, framing and finish.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish.

1. Door Finishes: Manufacturers' standard size.
2. Exposed Hardware: Full-size units.

1.4 INFORMATIONAL SUBMITTALS

- ###### A. Product Test Reports: For each configuration of fiberglass door, for tests performed by a qualified testing agency.

- ###### B. Sample Warranties: For fiberglass doors and frames.

1.5 QUALITY ASSURANCE

- ###### A. Installer Qualifications: An installer acceptable to manufacturer of fiberglass doors for installation of units required for this Project.

1.6 DELIVERY, STORAGE, AND HANDLING

- ###### A. Deliver materials to site in manufacturer's original, unopened, containers and packaging.

- B. Labels clearly identifying opening, door mark, and manufacturer.
- C. Store materials in a clean, dry area, indoors in accordance with manufacturer's instructions.
- D. Protect materials and finish from damage during handling and installation.

1.7 WARRANTY

- A. **Manufacturer's Warranty:** Manufacturer agrees to repair or replace fiberglass doors and frames that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including excessive deflection, water leakage, and air infiltration.
 - b. Deterioration of materials and finishes beyond normal weathering.
 - c. Warranty Period: 10 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. **Thermal Transmittance:** NFRC 100 maximum whole-unit U-factor of 0.30 Btu/sq. ft. x h x deg F (1.70 W/sq. m x K).
- B. **Sound Transmission Class (STC):** Rated for not less than 25 STC when tested for laboratory sound transmission loss in accordance with ASTM E90 and determined by ASTM E413.

2.2 FIBERGLASS DOORS AND FRAMES

- A. **Acceptable Manufacturers:** Subject to compliance with requirements, provide approved products from one of the following manufacturers:
 - 1. Pella Impervia, web: www.pella.com
 - 2. Milgard windows and doors.
 - 3. Substitution: Per Division 01
- B. **Source Limitations:** Obtain doors and frames from single manufacturer.
- C. **Fiberglass Doors:**
 - 1. **Door Thickness:** 1-3/4 inch, otherwise indicated on Drawing.
 - 2. **Core.**
 - a. Polyurethane foam.
 - b. Minimum 6 pcf density.
 - 3. **Color:** As indicated on Drawings.
 - 4. **Top Rail.**
 - a. 6" pultruded tube profile designed to fit flush and be chemically welded inside of door cavity.
 - 5. **Bottom Rail.**
 - a. Standard pultruded inverted U channel designed to fit flush and be chemically welded inside the door which allows doors to be field trimmed.
 - 6. **Physical Properties:**

- a. Surface Burning, ASTM E84: Flame Spread \leq 25, Smoke Developed \leq 450.
- b. Compressive Strength, ASTM D1621: 139 psi.
- c. Shear Strength, ASTM C273: 84 psi.
- d. Shear Modulus, ASTM C273: 788 psi.
- e. Tensile Modulus, ASTM D1623: 136 psi.
- f. Flexural Strength, ASTM C203: 204 psi.
- g. R-Factor, ASTM C518: 6.25 hr·ft²·°F/Btu.
- h. Water Absorption, ASTM C272: < 0.7% by volume.

D. Fiberglass Frames:

1. Perimeter Frame Members.

- a. 1/4" – 3/16" thick pultruded fiberglass open throat with return.
- b. Factory fabricated.
- c. 2" or 4" face available for frame headers.

2. Frame Member to Member Connections.

- a. Corners mitered with 4" x 4" x 3/8" angle reinforcement with interlocking brackets.

3. Physical Properties:

- a. Tensile Strength, ASTM D638: Minimum 30,000 psi.
- b. Compressive Strength, ASTM D695: Minimum 30,000 psi.
- c. Flexural Strength, ASTM D790: Minimum 30,000 psi.
- d. Surface Burning, ASTM E84: Flame Spread \leq 25, Smoke Developed \leq 450.

E. Hardware: Comply with Section 08 71 00.

F. Fasteners: Noncorrosive and compatible with door members, trim, hardware, anchors, and other components.

2.3 FABRICATION

A. Fabricate door assemblies in sizes and configurations indicated. Include a complete system for installing and anchoring door assemblies.

B. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify rough-opening dimensions, levelness of threshold substrate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF DOORS AND FRAMES

- A. Comply with manufacturer's written instructions for installing door assemblies, hardware, accessories, and other components.
- B. Install door assemblies level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

3.3 ADJUSTING

- A. Adjust panels and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

3.4 CLEANING

- A. Clean exposed surfaces immediately after installing door assemblies. Remove excess sealants, dirt, and other substances.
 - 1. Keep protective films and coverings in place until final cleaning.

3.5 PROTECTION

- A. Protect door surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact door surfaces, remove contaminants immediately in accordance with manufacturer's written instructions.

END OF SECTION 08 16 13

SECTION 08 54 13 – FIBERGLASS WINDOWS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fiberglass windows.

1.2 DEFINITIONS

A. Combination Assemblies: Assemblies formed by a combination of two or more separate fenestration products whose frames are mullied together utilizing a combination mullion or reinforcing mullion.

B. Combination Mullions: Horizontal or vertical members formed by joining two or more individual fenestration units together without a mullion stiffener.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review, discuss, and coordinate the interrelationship of fiberglass windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes.

B. Shop Drawings:

1. Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, window rough openings, and details of installation, including anchor, flashing, and sealant installation.

C. Samples for Initial Selection: For units with factory-applied finishes, manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

1. Include Samples of hardware and accessories involving color selection.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish:

1. Exposed Finishes: 2 by 4 inches (50 by 100 mm).

2. Exposed Hardware: Full-size units.

E. Product Schedule: For fiberglass windows. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Test and Evaluation Reports:

1. Product Test Reports: For each fiberglass window, for tests performed by qualified testing agency.

B. Field Quality-Control Reports: For fiberglass windows.

C. Qualification Statements: For manufacturer and Installer.

D. Sample warranties.

1.6 CLOSEOUT SUBMITTALS

A. Warranty Documentation:

1. Manufacturers' special warranties.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer capable of fabricating fiberglass windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.

B. Installer Qualifications: An installer acceptable to fiberglass window manufacturer for installation of units required for this Project.

C. Testing Agency Qualifications: An FGIA- or WDMA-accredited testing agency for testing indicated.

1.8 MOCKUPS

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution. See Section 01 43 39 "Mockups" for additional construction requirements for integrated exterior mockups.

1. Build mockup as indicated on Drawings.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations by Change Order.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver fiberglass windows to Project site in original, unopened packages and store them in accordance with manufacturer's written instructions. Protect fiberglass windows against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Handle fiberglass windows in a manner that prevents damage before, during, and after installation.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install fiberglass windows outside of limits recommended in writing by manufacturer.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fiberglass windows that fail in materials or workmanship within specified warranty period.

- 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures, including excessive deflection, water leakage, and air infiltration.
 - c. Faulty operation of movable sash and hardware.
 - d. Deterioration of materials and finishes beyond normal weathering.
 - e. Failure of insulating glass.
- 2. Warranty Period:
 - a. Window: 10 years from date of Substantial Completion.
 - b. Glazing Units: 10 years from date of Substantial Completion.
 - c. Hardware: Three years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain fiberglass windows from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

- 1. Window Certification: FGIA or WDMA certified with label attached to each window.

- B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

- 1. Minimum Performance:
 - a. Class R.
 - b. Grade 15.
- 2. Muller Window Systems: Evaluate and rate combination assemblies as single systems as determined by AAMA 450 in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 requirements.

- C. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:

- 1. Thermal Transmittance (U-factor): As determined in accordance with NFRC 100 and as indicated on Drawings.

- D. Outdoor-Indoor Transmission Class (OITC): Rated for not less than 26 OITC when tested for laboratory sound transmission loss in accordance with ASTM E90 and determined by ASTM E1332.

2.3 FIBERGLASS WINDOWS

- A. Basis of Design Manufacturer: Pella Impervia, web: www.pella.com
 - 1. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved products from one of the following manufacturers:
 - a. Milgard windows and doors.
 - b. Marvin Windows.
 - c. Substitution: Per Division 01
- B. General: Provide manufacturer's standard fiberglass window assemblies consisting of frames, sashes, glass, hardware, fasteners, and all components and accessories as required for a complete installation.
- C. Operating Types: Provide the following operating types in locations indicated on Drawings:
 - 1. Casement: Project in.
 - 2. Fixed.
- D. Frames and Sashes: Pultruded fiberglass with insulating foam inserts complying with AAMA/WDMA/CSA 101/I.S.2/A440 and with exposed exterior fiberglass surfaces finished with manufacturer's standard enamel coating complying with AAMA 623.
 - 1. Exterior Color: As selected by Architect from manufacturer's full range.
 - 2. Interior Finish: Matching exterior finish, in color selected by Architect from manufacturer's full range.
- E. Glass: Clear annealed glass, ASTM C1036, Type 1, Class 1, q3.
 - 1. Kind: Fully tempered where indicated on Drawings.
- F. Insulating-Glass Units: ASTM E2190.
 - 1. Glass: ASTM C1036, Type 1, Class 1, q3.
 - a. Tint: Clear.
 - b. Kind: Fully tempered where indicated on Drawings.
 - 2. Lites: Two.
 - 3. Filling: Fill space between glass lites with argon.
 - 4. Low-E Coating: As per manufacturers standard coating.
 - 5. Froster privacy glazing: As indicated on Drawings.
- G. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
- H. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock fiberglass windows, and sized to accommodate sash weight and dimensions.
 - 1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.

- I. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
- J. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
 - 1. Exposed Fasteners: Avoid exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.
- K. Mullions: Provide combination and reinforcing mullions and cover plates matching window units, complete with anchors for support to structure. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide reinforcing mullions and cover plates capable of withstanding design wind loads of window units.

2.4 ACCESSORIES

- A. Nail Fins: Manufacturer's standard mounting flanges with holes pre-punched for mechanical fasteners.

2.5 INSECT SCREENS

- A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
 - 1. Type and Location: Full, outside for project-in sashes.
- B. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
 - 1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
 - 2. Finish for Interior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.
 - 3. Finish for Exterior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.
- C. Aluminum Wire Fabric: 18-by-16-inch (1.1-by-1.3-mm) mesh of 0.011-inch- (0.28-mm-) diameter, coated aluminum wire.
 - 1. Wire-Fabric Finish: Black.

2.6 FABRICATION

- A. Fabricate fiberglass windows in sizes indicated. Include a complete system for installing and anchoring windows.
- B. Glaze fiberglass windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.
- D. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF FIBERGLASS WINDOWS

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E2112.
- B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Mullions: Install combination and reinforcing mullions for combination assemblies in accordance with manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
 - 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Test and inspect installed windows as follows:
 - 1. Testing Methodology: Testing of windows for air infiltration and water resistance to be performed in accordance with AAMA 502.
 - 2. Air-Infiltration Testing:
 - a. Test Pressure: As required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.
 - b. Allowable Air-Leakage Rate: 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.
 - 3. Water-Resistance Testing:
 - a. Test Pressure: Two-thirds times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
 - b. Allowable Water Infiltration: No water penetration.
 - 4. Testing Extent: Three windows of each type as selected by Architect and a qualified independent testing and inspecting agency. Windows to be tested immediately after installation.
 - 5. Test Reports: Prepared in accordance with AAMA 502.

6. Windows will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.4 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

B. Clean exposed surfaces immediately after installing windows using manufacturer's written instructions. Remove excess sealants, glazing materials, dirt, and other substances.

1. Keep protective films and coverings in place until final cleaning.

C. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.

D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately in accordance with manufacturer's written instructions.

END OF SECTION 08 54 13

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**SECTION 08 71 00 –
DOOR HARDWARE**

PART 1 GENERAL

- A. SEE DRAWING SHEET A2.9 FOR DOOR AND HARDWARE SCHEDULE

END OF SECTION 08 71 00

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SECTION 08 80 00 - GLAZING

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. Glass products.
2. Insulating glass.
3. Glazing sealants.
4. Glazing tapes.
5. Miscellaneous glazing materials.

- B. Related Requirements:

1. Pertinent Division 01 sections for VOC Requirements.
2. Pertinent Division 08 sections for doors requiring view glass in light frames.
3. Section 07 92 00 "Joint sealers"
4. Section 08 41 13 "Aluminum framed entrance and storefronts"

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.
- C. CBC: California Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

1.5 PREINSTALLATION MEETING

- A. Schedule a preinstallation meeting with architect, Owner's representative and general contractor in attendance.

1.6 REFERENCES

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California Amendments.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."

1.7 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.
 - 1. Insulating glass.
- C. Glazing Accessory Samples: For sealants, in 12-inch (300-mm) lengths. Install sealant Samples between two strips of material representative in color of adjoining framing system.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.8 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturers of fabricated glass units.
- B. Product Certificates: For glass.
- C. Product Test Reports: For fabricated glass and glazing sealants, for tests performed by a qualified testing agency.
 - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Preconstruction adhesion and compatibility test report.
- E. Sample Warranties: For special warranties.

1.9 QUALITY ASSURANCE

- A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved and certified by primary glass manufacturer.
- B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors and who employs glazing technicians certified under the Architectural Glass and Metal Technician (AGMT) certification program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

1.10 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
2. Use ASTM C1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.12 MAINTAINANCE MATERIAL SUBMITTAL

- A. Furnish extra material, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing content.
 1. Provide one pane of glass for each glass size on the project.

1.13 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

1.14 WARRANTY

- A. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain tinted and coated glass from single source from single manufacturer.
- B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.
- C. Acceptable Manufacturers:
 1. Vitro Architectural Glass

2. AGC Class company North America Inc.
3. Saint Gobain Glass Corp.
4. Substitution: AS per Division 01

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to 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. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the CBC and ASTM E1300:
 1. 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 (25 mm), whichever is less.
- C. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 1. For laminated-glass lites, properties are based on products of construction indicated.
- D. Energy Efficiency Requirements: The maximum U values, maximum solar heat gain coefficient, and minimum visible transmittance must meet the most current Building Energy Efficiency Standards Prescriptive Requirements of additions or alterations, unless the Performance based Title 24 calculations recommend more stringent values.
- E. GWP Limit for Flat Glass: 2.5 MT CO₂e/MT.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 1. NGA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
- B. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.
- C. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- B. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2.5 INSULATING GLASS

- A. Insulating Glass Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.
 - 1. 1" insulated glass consisting of 6mm clear SB70 (2) +1/2" air gap+ 6 mm laminated glazing with 0.030" PVB CLR. Window sash assemblies to be factory glazed with insulated glass units.
 - 2. Interlayer Thickness: Provide thickness not less than 0.030 inch thick, that indicated and as needed to comply with requirements. Do not tint glazing, Low E coatings should remain as clear and non-reflective as possible.
 - 3. Low-E Glass: Provide hard coat Low-E glass. Low-E coating should be placed on at least one of the glass surfaces facing the air space.

2.6 GLAZING SEALANTS

- A. General:
 - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.

2.7 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks:
 - 1. EPDM with Shore A durometer hardness of 85, plus or minus 5.
 - 2. Type recommended in writing by sealant or glass manufacturer.

D. Spacers:

1. Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
2. Type recommended in writing by sealant or glass manufacturer.

E. Edge Blocks:

1. EPDM with Shore A durometer hardness per manufacturer's written instructions.
2. Type recommended in writing by sealant or glass manufacturer.

2.9 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 2. Presence and functioning of weep systems.
 3. Minimum required face and edge clearances.
 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Training:
 1. Provide two (2), two-hour training sessions on replacing glazing from each type of window frame. Training shall include removal and reinstallation of at least one pane.
 2. Glazing to be installed from inside the building when the top of the panes are over eight feet above grade

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch- (3-mm-) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 GLASS SCHEDULE

- A. Clear Insulating Glass Type:
 - 1. Overall Unit Thickness: 1 inch (25 mm).
 - 2. Minimum Thickness of Each Glass Lite: 6 mm.

3. Interspace Content: Argon.
4. Low-e glass required.

END OF SECTION 08 80 00

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SECTION 08 83 00 - MIRRORS

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. Frameless mirrors with shelves.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Mirrors: Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.
- B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachment details.
- C. Samples: For each type of the following:
 - 1. Mirrors With Shelf: Full size unit, including edge treatment on two adjoining edges.
 - 2. Mirror Trim: 12 inches (300 mm) long.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of mirror, shelf and mirror mastic.
- C. Preconstruction Test Reports: From mirror manufacturer indicating that mirror mastic was tested for compatibility and adhesion with mirror backing and substrates on which mirrors are installed.
- D. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For mirrors to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified Installer, who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing.

1. Testing is not required if data are submitted based on previous testing of mirror mastic products and mirror backing matching those submitted.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect mirrors and shelves in accordance with mirror manufacturer's written instructions and as needed to prevent damage to mirrors from moisture, condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.
 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Source Limitations for Mirrors: Obtain mirrors from single source from single manufacturer.
- B. Source Limitations for Mirror Accessories: Obtain mirror-glazing accessories from single source.

2.2 SILVERED FLAT GLASS MIRRORS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering mirrors that may be incorporated into the Work include, but are not limited to, the following:
 1. Arch Aluminum & Glass Co., Inc.
 2. Gardner Glass Products.
 3. Gilded Mirrors, Inc.
 4. Guardian Industries Corp.
 5. Lenoir Mirror Company.
 6. Messer Industries, Inc.
 7. Stroupe Mirror Co., Inc.
 8. Sunshine Mirror.
 9. Virginia Mirror Company, Inc.
 10. VVP America, Inc.; Binswanger Mirror Products.
- B. Mirrors, General: ASTM C1503.
- C. Tempered Glass Mirrors: Mirror Glazing Quality for blemish requirements and complying with ASTM C1048 for Kind FT, Condition A, tempered float glass before silver coating is applied; clear.

1. Nominal Thickness: 6.0 mm.

D. Shelves: Frameless, stainless steel shelves.

1. Thickness: As indicated on Drawings.
2. Color: As indicated on Drawings.

2.3 MISCELLANEOUS MATERIALS

A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.

1. 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:
 - a. Gunther Mirror Mastics.
 - b. Palmer Products Corporation.
 - c. Pecora Corporation.
2. Primers/Sealers: Types recommended by adhesive manufacturer as required.

D. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

2.4 MIRROR HARDWARE

A. Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover edges of mirrors in a single piece.

1. Bottom Trim: J-channels formed with front leg and back leg not less than 5/16 and 3/4 inch (7.9 and 19 mm) in height, respectively.
2. Top Trim: Formed with front leg with a height of 5/16 inch (7.9 mm) and back leg designed to fit into the pocket created by wall-mounted aluminum cleat.
3. Product: Subject to compliance with requirements, provide the following:
 - a. Bottom Trim: C. R. Laurence Co., Inc.; D638 FHA Type "J" Channel.
 - b. Top Trim: C. R. Laurence Co., Inc.; D 1638 Top Channel.
4. Finish: Clear bright anodized.

B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

C. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield, expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.5 FABRICATION

A. Shop fabricate mirrors to greatest extent possible.

- B. Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts, so they fit closely around penetrations in mirrors.
- C. Mirror Edge Treatment: Flat polished.
 - 1. Seal edges of mirrors with edge sealer after edge treatment to prevent chemical or atmospheric penetration of glass coating.
 - 2. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.
- D. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint, as recommended in writing by film-backing manufacturer, to produce a surface free of bubbles, blisters, and other imperfections.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.
- B. Verify compatibility with and suitability of substrates, including compatibility of existing finishes or primers with mirror mastic.
- C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

- A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

3.3 INSTALLATION

- A. General: Install mirrors and shelves to comply with mirror manufacturer's written instructions and with referenced National Glass Association (NGA) publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
 - 1. NGA Publications: "Glazing Manual" and "Installation Techniques Designed to Prolong the Life of Flat Glass Mirrors."
- B. Provide a minimum airspace of 1/8 inch (3 mm) between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.
- C. Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
 - 1. Aluminum J-Channels: Provide setting blocks 1/8 inch (3 mm) thick by 4 inches (100 mm) long at quarter points. To prevent trapping water, provide, between setting blocks, two slotted weeps not less than 1/4 inch (6.4 mm) wide by 3/8 inch (9.5 mm) long at bottom channel.
 - 2. Install mastic as follows:
 - a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.
 - b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
 - c. After mastic is applied, align mirrors and press into place while maintaining a minimum airspace of 1/8 inch (3 mm) between back of mirrors and mounting surface.

3.4 CLEANING AND PROTECTION

- A. Protect mirrors from breakage and contaminating substances resulting from construction operations.
- B. Do not permit edges of mirrors to be exposed to standing water.
- C. Maintain environmental conditions that prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.
- D. Clean exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Clean mirrors as recommended in writing by mirror manufacturer and NGA's publication "Proper Procedures for Cleaning Flat Glass Mirrors."

END OF SECTION 08 83 00

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SECTION 08 95 16 – WALL VENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall vents.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each type of metal finish required.

1.3 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For flood vents, from ICC-ES.
- B. Sample Warranties: For manufacturer's special warranties.

1.4 WARRANTY

A. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Warranty Period: **[Five]** **[10]** **[20]** **<Insert number>** years from date of Substantial Completion.

B. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, peeling, or chipping.
2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain vents from single source from single manufacturer.

2.2 WALL VENTS

- A. Extruded-Aluminum Wall Vents:

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
2. Extruded-aluminum louvers and frames, not less than 0.125-inch (3.18-mm) nominal thickness, assembled by welding; with 18-by-14- (1.4-by-1.8-mm-) mesh, aluminum insect screening on inside face; incorporating weep holes, continuous drip at sill, and integral waterstop on inside edge of sill; of load-bearing design and construction.
3. Dampers: Aluminum blades and frames mounted on inside of wall vents; operated from exterior with Allen wrench in socket-head cap screw. Fabricate operating mechanism from Type 304 stainless steel components.
4. Finish: [Mill] <Insert finish>.

- B. Cast-Aluminum Wall Vents:

1. <Double click here to find, evaluate, and insert list of manufacturers and products.>
2. One-piece, cast-aluminum louvers and frames; with 18-by-14- (1.4-by-1.8-mm-) mesh, aluminum insect screening on inside face; incorporating integral waterstop on inside edge of sill; of load-bearing design and construction.
3. Dampers: Aluminum blades and frames mounted on inside of wall vents; operated from exterior with Allen wrench in socket-head cap screw. Fabricate operating mechanism from Type 304 stainless steel components.
4. Finish: Mill.

2.3 MATERIALS

- A. Aluminum Extrusions: ASTM B221 (ASTM B221M), Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B209 (ASTM B209M), Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Aluminum Castings: ASTM B26/B26M, Alloy 319.
- D. Stainless Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666 or ASTM A240/A240M, austenitic stainless steel, [Type 304] [Type 316] [Type 304 or 316 as indicated] <Insert type>.

2.4 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, [AA-M12C22A41, Class I, 0.018 mm] [AA-M12C22A31, Class II, 0.010 mm] or thicker.
- B. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
- C. Conversion-Coated Finish: AA-C12C42, nonetched, cleaned with inhibited chemicals, and chemical conversion coated with acid chromate-fluoride-phosphate.
- D. Factory-Primed Finish: AA-C12C42R1x with air-dried primer of not less than 2-mil (0.05-mm) dry film thickness.

- E. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.
- F. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
 - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions [**for seacoast and severe environments**].
- G. Superior-Performance Organic Finish, Three-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat.
 - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions [**for seacoast and severe environments**].
 - 2. Color and Gloss: As selected by Architect from manufacturer's full range.

2.5 STAINLESS STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1. Run grain of directional finishes with long dimension of each piece.
 - 2. When polishing is completed, passivate and rinse surfaces.
 - 3. Remove embedded foreign matter and leave surfaces chemically clean.
- C. Stainless Steel Sheet and Plate Finishes:
 - 1. Cold-Rolled, Bright Finish: ASTM A480/A480M, No. 2B.
 - 2. Directional Satin Finish: ASTM A480/A480M, No. 4.
- D. Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils (0.05 mm).
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install according to manufacturer's written instructions.
- B. Locate and place vents level, plumb, and at indicated alignment with adjacent work.
- C. Attach vents securely in place using fasteners supplied or approved by manufacturer.
- D. Protect unpainted surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- E. Build vents into masonry work as construction progresses; comply with requirements in Section 04 20 00 "Unit Masonry."

- F. Provide perimeter reveals of uniform width for sealants and joint fillers, where indicated.
- G. Use concealed anchorages.

3.2 ADJUSTING AND CLEANING

- A. Adjust flood vents for proper operation.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore vents damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

END OF SECTION 08 95 16

SECTION 09 22 16 -

NON-STRUCTURAL METAL FRAMING

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. Resilient and furring channels.
 - 2. Suspension systems for interior ceilings and soffits.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of code-compliance certification for studs and tracks.

1.5 QUALITY ASSURANCE

- A. Preapproved Acoustical Testing Agencies. Acoustical testing shall be completed by a laboratory located in North America. Acoustical testing (laboratory and field) shall be completed by one of the following laboratories. Compliance with these requirements does not supersede any other requirements herein. Laboratory and field testing can be completed by different agencies.
 - 1. Intertek: York, Pennsylvania
 - 2. Riverbank Acoustical Laboratories; Geneva, Illinois
 - 3. Western-Electro Acoustic Laboratory; Santa Clarita, California

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Notify manufacturer of damaged materials received prior to installation.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Protect metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 by an independent testing agency.

- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.
- C. Design Loads: As indicated on architectural Drawings or 5 lbf/sq. ft. (239 Pa) minimum as required by the IBC.
- D. Design framing systems to accommodate deflection of primary building structure and construction tolerances and to withstand design loads with a maximum deflection as indicated on Drawings.

2.2 RESILIENT AND FURRING CHANNELS

- A. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Steel Thickness: Match criteria of steel stud framing.
- B. Cold-Rolled Channel Bridging: Steel, 0.0538-inch (1.367-mm) minimum base-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: As indicated on Drawings
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.
- C. Hat-Shaped, Rigid Furring Channels: ASTM C645.
 - 1. Minimum Base-Steel Thickness: 0.0329 inch (0.836 mm).
 - 2. Depth: As indicated on Drawings .
- D. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
 - 1. Description: 22 mil steel; 1-1/2-inch wide screw flange for gypsum board attachment; predrilled mounting holes at 4 inches on center in mounting flange; dog-bone shaped slot hole in connecting flange approx. 3-1/2-inch in length.
 - 2. Performance: Channel shall provide minimum third-octave band transmission loss (TL) of 27 decibels at 100 Hz, 50 decibels at 250 Hz, and 60 decibels at 500 Hz when installed on one side of a three-layer single-stud 2x4 wood stud partition with batt insulation.
 - 3. Configuration: Asymmetrical single-leg channel.
 - 4. Acceptable Manufacturers:
 - a. CEMCO, California Expanded Metal Products Co., City of Industry, CA; www.cemcosteel.com.
 - b. ClarkDietrich Building Systems, West Chester, OH; www.clarkdietrich.com.
 - c. Or Approved equal
- E. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: As indicated on Drawings.
 - 2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch (0.8 mm).
 - 3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- F. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum uncoated-steel thickness of 0.0179 inch (0.455 mm), and depth required to fit insulation thickness indicated.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 AC193 AC58 or AC308 as appropriate for the substrate.
 - a. Uses: Securing hangers to structure.
 - b. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941 (ASTM F1941M), Class Fe/Zn 5, unless otherwise indicated.
 - c. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless steel bolts, ASTM F593 (ASTM F738M), and nuts, ASTM F594 (ASTM F836M).
 - 2. Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.16 inch (4.12 mm) in diameter.
- D. Flat Hangers: Steel sheet, 1 by 3/16 inch (25 by 5 mm) by length indicated.
- E. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-steel thickness of 0.0538 inch (1.367 mm) and minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: As indicated on Drawings.
- F. Grid Suspension System for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Basis of Design: Armstrong World Industries, Inc; Drywall Grid Systems for Drywall/Stucco/Plaster, www.armstrong.com
 - 2. DONN® Drywall Suspension System; USG, United State Gypsum Company; www.usg.com
 - 3. Chicago Metallic Corporation; www.chicago-metallic.com,

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 - 1. Asphalt-Saturated Organic Felt: ASTM D226/D226M, Type I (No. 15 asphalt felt), nonperforated.
 - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C754.
 - 1. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C1063 that apply to framing installation.
 - 2. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FURRING

- A. Direct Furring:
 - 1. Screw to wood framing.
 - 2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
- B. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.5 INSTALLING RESILIENT CHANNELS

- A. Install channels to framing members using predrilled holes in channel mounting flange.
- B. No contact between the edge of the resilient channel and any structure or perimeter element.
- C. Minimize screw attachment of gypsum board to resilient channel to the minimum number required by code.
- D. Utilize butt joints between channels in lieu of overlapping splice joints.

- E. Utilize screws of appropriate length for gypsum board attachment to avoid screws contacting framing behind channels.
- F. Edge of channel flange shall not be in contact with framing prior to installation of gypsum board.
- G. Mark location of joists prior to installation to ensure channels are not short-circuited by screws.
- H. Channel orientation and remainder of installation methods shall be as described by the manufacturer.

3.6 INSTALLING CEILING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Hangers: 48 inches (1219 mm) o.c.
 - 2. Carrying Channels (Main Runners): 48 inches (1219 mm) o.c.
 - 3. Furring Channels (Furring Members): 16 inches (406 mm) o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 - 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 5. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 - 6. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - 7. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 09 22 16

SECTION 09 24 00 - CEMENT PLASTERING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Metal lath.
 2. Accessories.
 3. Base-coat cement plaster.
 4. Cement plaster finish coats.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data:
1. For each type of product.
- B. Shop Drawings: Locations and installation of control and expansion joints, including plans, elevations, sections, and attachment details.
- C. Samples for Initial Selection: For each type of factory-prepared finish coat and for each color and finish texture specified.
- D. Samples for Verification: For each type of factory-prepared finish coat and for each color and finish texture specified, 12 by 12 inches (305 by 305 mm), and prepared on rigid backing.

1.4 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
1. Build mockups for each substrate and color and finish texture indicated for cement plastering, including accessories.
 - a. Size: 100 sq. ft. (9 sq. m) in surface area.
 2. For interior plasterwork, simulate finished lighting conditions for review of mockups.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

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

1.6 FIELD CONDITIONS

- A. Comply with ASTM C926 requirements.
- B. Exterior Plasterwork:
 - 1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
 - 2. Apply plaster when ambient temperature is greater than 40 deg F (4.4 deg C).
 - 3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.
- C. Factory-Prepared Finish Coats: Comply with manufacturer's written instructions for environmental conditions for applying finish coats.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: Where indicated on Drawings, provide cement plaster assemblies identical to those of assemblies tested for fire resistance in accordance with ASTM E119 by a qualified testing agency.

2.2 METAL LATH

- A. Expanded Metal Lath: ASTM C847; cold-rolled carbon steel sheet, hot-dip galvanized with ASTM A653/A653M G60 (Z180) zinc coating.
 - 1. Acceptable Manufacturers: Subject to compliance with requirements, provide product from one of the following manufacturers:
 - a. ClarkDietrich, web: www.clarkdietrich.com
 - b. Cemco, web: www.cemcosteel.com
 - c. Alabama Metal Industries Company; a Gibraltar Industries company, web: www.amicoglobal.com
 - 2. Flat Diamond-Mesh Lath: 3.4 lb/sq. yd. (1.8 kg/sq. m).
 - 3. Self-Furring Diamond-Mesh Lath: V-grooved.
 - a. Weight: 3.4 lb/sq. yd. (1.8 kg/sq. m).
- B. Wire-Fabric Lath:
 - 1. Acceptable Manufacturers: Subject to compliance with requirements, provide product from one of the following manufacturers:
 - a. ClarkDietrich, web: www.clarkdietrich.com
 - b. Cemco, web: www.cemcosteel.com
 - c. Alabama Metal Industries Company; a Gibraltar Industries company, web: www.amicoglobal.com
 - 2. Woven-Wire Lath: ASTM C1032; self-furring, with stiffener wires, 1.4 lb/sq. yd. (0.8 kg/sq. m), with 1.5-inch (38-mm) openings, and woven from 0.051-inch (1.30-mm) diameter wire.

2.3 ACCESSORIES

- A. General: Comply with requirements in ASTM C1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories:
1. Foundation Weep Screed: Fabricated from hot-dip-galvanized steel sheet with ASTM A653/A653M G60 (Z180) zinc coating.
 2. External- (Outside-) Corner Reinforcement: Fabricated from metal lath, hot-dip galvanized with ASTM A653/A653M [G60 (Z180)] [G90 (Z275)] zinc coating.
 3. Soffit Drip Screed: Fabricated from hot-dip-galvanized steel sheet with ASTM A653/A653M G60 (Z180) zinc coating.
 4. Ventilating Screed for Soffit: Fabricated from hot-dip-galvanized steel sheet with ASTM A653/A653M G60 (Z180) zinc coating.
 5. Cornerbeads: Fabricated from zinc-coated (galvanized) steel.
 - a. Smallnose cornerbead with expanded flanges; use at locations indicated on Drawings.
 - b. Smallnose cornerbead with perforated flanges; use at locations indicated on Drawings.
 - c. Smallnose cornerbead with expanded flanges reinforced by perforated stiffening rib; use at locations indicated on Drawings.
 - d. Bullnose cornerbead, radius 3/4-inch (19-mm) minimum, with expanded flanges; use at locations indicated on Drawings.
 6. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
 7. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on exposed face of control joint.
 8. One-Piece Expansion Joints: Fabricated from zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
 9. Two-Piece Expansion Joints: Fabricated from zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch (6 to 16 mm) wide; with perforated flanges.

2.4 BASE-COAT CEMENT PLASTER

- A. General: Comply with requirements in ASTM C926 for applications indicated.
1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. (0.6 kg of fiber/cu. m) of cementitious materials.
 2. Aggregate:
 - a. Sand: Use unless otherwise indicated.
 - b. Perlite: Use where required by fire-resistance-rated design designations from listing organization and publication indicated on Drawings.
- B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:
1. Portland Cement Mixes:

- a. Scratch Coat: For cementitious material, mix 1 part portland cement and 0 to 3/4 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
- b. Brown Coat: For cementitious material, mix 1 part portland cement and 0 to 3/4 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

2.5 CEMENT PLASTER FINISH COATS

A. Job-Mixed Finish-Coat Mix: Comply with requirements in ASTM C926.

1. Aggregates:

- a. Sand: Use over base coats containing sand.
- b. Perlite: Use over base coats containing perlite.

2. Portland Cement Mix: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.

B. Ready-Mixed Finish-Coat Plaster: Factory-mixed portland cement, aggregates, coloring agents, and proprietary ingredients.

1. Basis of Design Product: Santa Barbara smooth finish as manufactured by LaHabra.

a. Other Acceptable Manufacturers: Subject to compliance with requirements, provide product from one of the following manufacturers:

- 1) Dryvit
- 2) Sherwin Williams
- 3) Omega Products international.
- 4) Substitution: AS per Division 01

2. Color: P-6 El Dorado or otherwise indicated on Drawings.

3. Source Limitations: Obtain ready-mixed finish-coat plaster from single source from single manufacturer.

2.6 PLASTER MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I.

B. Lime: ASTM C206, Type S; or ASTM C207, Type S.

C. Sand Aggregate: ASTM C897.

D. Perlite Aggregate: ASTM C35.

2.7 MISCELLANEOUS MATERIALS

A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in cement plaster.

C. Fasteners for Attaching Metal Lath to Substrates: ASTM C1063.

D. Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch (1.21-mm) diameter unless otherwise indicated.

- E. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- F. Acoustical Sealant: As specified in Section 079219 "Acoustical Joint Sealants."

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Reject plaster materials that are wet or moisture damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare smooth, solid substrates for plaster in accordance with ASTM C926.

3.3 INSTALLATION, GENERAL

- A. Fire-Resistance-Rated Assemblies: Install components in accordance with requirements for design designations from listing organization and publication indicated on Drawings.
- B. Sound-Attenuation Blankets: Where indicated on Drawings, install blankets before installing lath unless blankets are readily installed after lath has been installed on one side.
- C. Acoustical Sealant: Where indicated on Drawings, seal joints between edges of plasterwork and abutting construction with acoustical sealant.

3.4 INSTALLATION OF METAL LATH

- A. Metal Lath: Install in accordance with ASTM C1063.
 - 1. Partition Framing and Vertical Furring: Install lath as indicated on Drawings.

3.5 INSTALLATION OF ACCESSORIES

- A. Install in accordance with ASTM C1063 and at locations indicated on Drawings.
- B. Reinforcement for External (Outside) Corners:
 - 1. Install corner bead at exterior locations.
 - 2. Install cornerbead at interior locations.
- C. Control Joints: Locate as approved by Architect for visual effect and as follows:
 - 1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
 - a. Vertical Surfaces: 144 sq. ft. (13.4 sq. m).

- b. Horizontal and Other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
 - 2. At distances between control joints of not greater than 18 ft. (5.5 m) o.c.
 - 3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
 - 4. Where control joints occur in surface of construction directly behind plaster.
 - 5. Where plastered ceiling framing or furring changes direction.
 - 6. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.
- D. Expansion Joints: Locate where expansion joints occur in supporting construction.

3.6 APPLICATION OF BASE-COAT CEMENT PLASTER

- A. General: Comply with ASTM C926.
- 1. Install so that finished plaster surfaces will not deviate more than plus or minus 1/4 inch in 10 ft. (6 mm in 3 m) from a true plane when measured by a 10-ft. (3-m) straightedge placed on surface.
 - 2. Install so finished plaster surfaces will be flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets.
- B. Wall/Vertical Base Coats:
- 1. Three-Coat Plasterwork Over Metal Lath: Install base-coat mixes for use over metal lath to produce scratch and brown coats having 3/4-inch (19-mm) total thickness.

3.7 APPLICATION OF CEMENT PLASTER FINISH COATS

- A. General: Comply with ASTM C926.
- 1. Do not deviate more than plus or minus 1/4 inch in 10 ft. (6 mm in 3 m) from a true plane in finished plaster surfaces when measured by a 10-ft. (3-m) straightedge placed on surface.
 - 2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, groove finish coat at junctures with metal.
 - 3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.
- B. Plaster Finish Coats: Apply to provide float finish to match Architect's sample.
- C. Concealed Exterior Plasterwork: Where plaster application is used as a base for adhered finishes, omit finish coat.

3.8 REPAIR

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

3.9 CLEANING

- A. Remove temporary protection and enclosure of other work after plastering is complete.
- B. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered.

- C. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 09 24 00

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SECTION 09 29 00 - GYPSUM BOARD

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. Interior gypsum board.
2. Trim and Accessories

- B. Related Requirements:

1. Pertinent Sections specifying Sustainable Design Requirements.
2. Section 03 30 00 "Cast in place concrete"
3. Section 06 16 00 "Sheathing" for sheathing for exterior walls.
4. Section 09 22 16 "Non-Structural Metal Framing" for suspension systems that support gypsum board panels.

1.3 REFERENCES

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:

1. Gypsum wallboard.
2. Gypsum board, Type X.
3. Gypsum ceiling board.
4. Water-resistant gypsum backing board.
5. Interior trim.
6. Joint treatment materials.
7. Laminating adhesive.
8. Acoustical sealant.

- B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.

- C. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

D. Samples for Verification: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

1.7 WARRANTY

- A. Manufacturer Standard Warranty: Manufacturer and Installer agrees to repair and replace any damage or deterioration on gypsum board within 1 year(s) from the time of substantial completion.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of gypsum panel and joint finishing material from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.3 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
- B. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include those specified as Basis-of-Design and those specifically listed for each type as Alternates.

1. CertainTeed Corp. www.certainteed.com
2. Georgia-Pacific Gypsum LLC. www.gp.com/gypsum
3. National Gypsum Company. www.nationalgypsum.com
4. USG Corporation www.usg.com
5. Substitution: As per Division 01

C. All gypsum boards to be mildew and mold resistant, with a score of 10 on ASTM D3273.

2.4 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C1396/C1396M.

1. Thickness: 1/2 inch (12.7 mm).
2. Long Edges: Tapered.

B. Gypsum Board, Type X: ASTM C1396/C1396M.

1. Basis of Design: ToughRock® Fireguard X™ gypsum board as manufactured by GP, Georgia Pacific Gypsum LLC.
2. Alternate products that may be incorporated into the Work include the following:
 - a. National Gypsum, Gold Bond Brand Fire Shield Gypsum Board
 - b. USG, SHEETROCK® FireCode
3. Thickness: 5/8 inch (15.9 mm).
4. Long Edges: Tapered.

C. Gypsum Ceiling Board: ASTM C1396/C1396M.

1. Basis of Design: Gold Bond Brand XP® Gypsum Board, as manufactured by National Gypsum Company.
2. Alternate products that may be incorporated into the Work include the following:
 - a. USG, SHEETROCK® Mold Tough
3. Thickness: 1/2 inch (12.7 mm).
4. Long Edges: Tapered.

D. Water-Resistant Gypsum Backing Board: ASTM C1396/C1396M, with manufacturer's standard edges.

1. Core: As indicated on Drawings.

2.5 TRIM AND ACCESSORIES

A. Interior Trim: ASTM C1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.

- f. Expansion (control) joint.
- g. Base-of-Wall Galvanized Moisture Barrier Trim: Galvanized-steel sheet, 2 inches (50 mm) high.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

- 1. Manufacturer: As noted on drawings.
- 2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B221 (ASTM B221M), Alloy 6063-T5.
- 3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. Joint Tape:

- 1. Interior Gypsum Board: Paper.
- 2. Water Resistant Gypsum Board: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

- 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
- 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
- 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
- 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
- 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

D. Joint Compound for Water Resistant Gypsum Board:

- 1. Use setting-type taping compound and setting-type, sandable topping compound.

E. High Build Drywall Surfer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

- 1. Product recommended by manufacturer for application, or equivalent.

2.7 AUXILIARY MATERIALS

A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

- 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
- 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

- D. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- E. Acoustical Sealant: As specified in Section 07 92 00 "Joint Sealants."
- F. Thermal Insulation: As specified in Section 07 21 00 "Thermal Insulation."
- G. Vapor Retarder: As specified in Division 07.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

- A. Comply with ASTM C840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in locations as indicated on Drawings in the largest pieces possible for any surface.
 - 1. Wallboard Type: Vertical surfaces unless otherwise indicated.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - 3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application:
 - 1. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - 2. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
 - 3. Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.
- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- E. Water-Resistant Backing Board: Install where indicated with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.
- F. Where backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.4 INSTALLATION OF TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners unless otherwise indicated.
 - 2. Bullnose Bead: Use where indicated on Drawings.
 - 3. LC-Bead: Use at exposed panel edges.
 - 4. L-Bead: Use where indicated on Drawings.
 - 5. U-Bead: Use at exposed panel edges.
- D. Aluminum Trim: Install in locations indicated on Drawings.

3.5 FINISHING OF GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile and panels that are substrate for acoustical tile.
 - 3. Level 3: Where heavy wallcovering is installed
 - 4. Level 4: At panel surfaces exposed to view, unless otherwise indicated. Light orange peel finish.
 - a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

3.6 APPLICATION OF TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written instructions.

3.7 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

SECTION 09 50 00 - ACOUSTICAL PANEL CEILINGS

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. Direct Attached Ceiling Panels.
- B. Related Requirements:
 - 1. Pertinent section specifying sustainable design requirements.
 - 2. Section 07 92 00 "Joint Sealants"
 - 3. Section 09 81 00 "Acoustical Insulation"
 - 4. Division 26 - Electrical

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 REFERENCES

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at site with architect, owner's representative, and General Contractor.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- A. Shop Drawings: Submit reflected ceiling plans drawn to scale prescribed by Architect.
 - 1. Include coordinated penetrations and ceiling-mounted items.
 - 2. Include any necessary details or drawings from the manufacturer regarding recommended installation.
- B. Samples: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
 - 1. Acoustical Panels: Set of full-size 6-inch- (150-mm-) square Samples of each type, color, pattern, and texture.

1.7 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Method of attaching ceiling to building structure.
 - 2. Size and location of initial access modules for acoustical panels.
 - 3. Items penetrating finished ceiling and ceiling-mounted items including the following:
 - a. Lighting fixtures.
 - b. Diffusers.
 - c. Grilles.
 - d. Speakers.
 - e. Sprinklers.
 - f. Access panels.
 - g. Perimeter moldings.
 - 4. Show operation of hinged and sliding components covered by or adjacent to acoustical panels.
 - 5. Minimum Drawing Scale: 1/8 inch = 1 foot (1:96).
- B. Qualification Data: For testing agency.
- C. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Field quality-control reports.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Units: Full-size panels equal to or no more than 5 percent of quantity installed.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.11 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.12 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to replace/repair the panels if there is any visible sag, mold, mildew, and bacterial growth on the panel for lifetime.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with the most stringent limited specified in Division 01 and tested and determined compliant per the referenced standards for each material type.
- B. Seismic Performance: Direct attached ceilings shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- C. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Class A according to ASTM E1264.
 - 2. Smoke-Developed Index: 50 or less
- D. Submit test reports showing NRC performance.

2.2 MANUFACTURERS

- A. Source Limitations: Obtain each type of acoustical ceiling panel from single source from single manufacturer.
- B. Available Manufacturers:
 - 1. FSorb, www.fsorb.com
 - 2. Armstrong World Industries, Inc., www.armstrong.com
 - 3. USG, www.usg.com
 - 4. CertainTeed,
 - 5. Substitution: As per Division 01

2.3 ACOUSTICAL PANELS

- A. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
- B. Basis of Desing Product: Product, 1" as manufactured by FSorb, web: www.fsorb.com.
- C. Material: 100% PET plastic fibers.
- D. Product Properties:
 - 1. NRC Rating: 0.70
 - 2. Thickness: 1 inch
 - 3. Modular Size: 48 X 96 inches.
 - 4. Color: As selected by Architect from manufacturers full range.
- E. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold,

mildew, or bacterial growth when tested according to ASTM D3273, ASTM D3274, or ASTM G21 and evaluated according to ASTM D3274 or ASTM G21.

2.4 PANEL ATTACHMENT

- A. Ceiling Tile Adhesive:
1. TiteBond GREENChoice Acoustical Ceiling Tile Adhesive manufactured by Franklin International.
 2. Sikabond Construction Adhesive manufactured by Sika USA.
 3. Substitution: As per Division 01

2.5 SEALANT

- A. Sealant: As specified in Section 07 92 00 "Joint Sealants."

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

- A. Install acoustical panel ceilings in accordance with local code requirements and manufacturer's written instructions.

3.4 CLEANING

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

END OF SECTION 09 50 00

SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

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. Rubber base

1.3 REFERENCES

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches (300 mm) long.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches (300 mm) long.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following periods:

1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 PRODUCTS

2.1 RUBBER BASE

- A. Products: Provide top set cove rubber wall base by one of the following manufacturers:
1. Mannington Mills, web: www.manningtoncommercial.com
 2. Tarkett, web: www.commercial.tarkett.com
 3. Substitution: As per Division 01
- B. Thickness: As indicated on Drawings.
- C. Height: 6" minimum.
- D. Color: As selected by Architect from manufacturers full range.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

- C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required and indicated on Drawings.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
- C. Protect resilient products from marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09 65 13

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SECTION 09 81 00 - ACOUSTICAL INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Acoustical insulation.

1.3 RELATED REQUIREMENTS

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 91 13 "General Commissioning Requirements"
- C. Division 07 Sections specifying thermal and firestopping insulation.
- D. Section 07 21 00 "Thermal Insulation" for thermal insulation applications and perimeter fire-containment systems.

1.4 REFERENCES

- A. Codes and Standards: Comply with the provisions of the documents listed below and with the requirements described in this Section. Use current editions of documents unless earlier editions are specifically referenced by the governing code or are otherwise indicated.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- C. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- D. Acoustical Report.
- E. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.

1.5 SUBMITTALS

- A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.
- B. Product data for each type of insulation product specified. Demonstrate compliance with specified attributes.
 - 1. Submit manufacturer's data sheets, published instructions and other relevant data.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on tests performed by qualified independent testing laboratory evidencing compliance of fire performance characteristics, and other properties, based on comprehensive testing of current products.

1.7 CLOSEOUT SUBMITTALS:

- A. Warranty: Submit specified warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, and undamaged packaging with identification labels intact.
- B. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's recommendations for handling, storage, and protection during installation.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC Limits for adhesives sealants, fillers and primers. Comply with limits specified in related section.
- B. Fire Performance Characteristics: Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per the ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.
 - 1. Surface Burning Characteristic: ASTM E84.
 - 2. Fire Resistance Ratings: ASTM E119.
 - 3. Combustion Characteristics: ASTM E136.

2.2 ACOUSTICAL BATT INSULATION

- A. Description: Pre-formed and flexible plant based insulation for packing and filling large and/or critical openings.
- B. Basis of Design Product: Hempwool as manufactured by Hempitecture, web: www.hempitecture.com.
 - 1. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved products from on of the following manufacturers:
 - a. Rockwool
 - b. Owens Corning
 - c. Substitution: As per Division 01
- C. Physical Properties:
 - 1. Thickness: 3.5 inch
 - 2. Density: 2.81 lbs/ft3.
 - 3. Vapor Permeability: 37 perms/0.647ng/pa.s.m2
 - 4. Substitutions: Per Division 01.

2.3 INSULATION FASTENERS AND ADHESIVES

- A. Mechanical Fasteners: Provide tape, staples, and other devices for fastening insulation as required, recommended, approved, or accepted by the insulation manufacturer.
- B. Other Accessories: Provide other accessories and similar secondary items as supplied, required, recommended, approved, or accepted by the insulation manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions with Installer present, for compliance with requirements of the Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory.
 - 1. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's instructions applicable to products and application indicated.
 - 1. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with installation of insulation.
- B. Acoustically Insulated Walls and Partitions:
 - 1. Extend acoustical construction to 1/8 inch minimum and 1/2 inch maximum of adjacent construction for installation of packing and acoustical sealant.
 - 2. Cut openings accurately in acoustical construction to allow space around electrical boxes, piping, ductwork and other penetrating elements so they remain free of rigid connection with the surrounding construction.
 - 3. Prior to packing and installing acoustical sealant at penetrations, verify that all penetrating elements are free and clear of the opening to be packed and sealed.
 - 4. Remove projections that interfere with placement.
- C. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- D. Provide sizes (widths and thicknesses) to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths.
 - 1. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.
 - 2. Install full lengths whenever possible to fill entire length of wall cavity.
- E. Install acoustical insulation batts in all stud partition walls. Install batts prior to installing gypsum panels unless batts are readily installed after panels have been installed on one side.

3.4 ACOUSTICAL INSULATION INSTALLATION

- A. Apply insulation units to substrate by method indicated, complying with manufacturer's written recommendations.
 - 1. Place insulation at wall construction, and where shown on Drawings in manner to insure continuous acoustic barrier.
- B. Sound Attenuation Wall Insulation Installation:
 - 1. Install unfaced acoustic batts in cavities formed by framing members at all interior wall cavities.
 - a. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Install batts above termination of gypsum wallboard utilizing 18 gauge wire perpendicular to the batt at 18 -inches on center, or attach pin anchor at intervals required by insulation manufacturer.
 - 4. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

3.5 PROTECTION

- A. General: Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- B. Replace damaged installed products.

3.6 INSULATION SCHEDULE

- A. General: When spaces are also scheduled for building thermal insulation, install insulation as specified in Section 07 21 00 "Thermal Insulation".
 - 1. All other locations as indicated on the drawings, or as required to complete an acoustical barrier between two adjacent spaces as indicated.
- B. Interior Partitions: Install Sound Attenuation Batts, from floor to underside of deck as noted on Drawings.

END OF SECTION 09 81 00

SECTION 09 84 00 –

ACOUSTIC WALL AND CEILING SYSTEM

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. Compressed straw panels for wall and ceiling.
- B. Related Sections:
 - 1. Pertinent section specifying the VOC limits and sustainable design requirements.
 - 2. Section 07 92 00 "Joint Sealants" to achieve fire rating.
 - 3. Section 09 29 00 "Gypsum Board".
 - 4. Section 09 91 23 "Interior Painting" for paint to be applied on the paneling.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include data on physical characteristics, durability, fade resistance, and fire-test-response characteristics.
- B. Shop Drawings: Show location and extent of each paneling type. Indicate seams and termination points.
- C. Samples for Initial Selection: For each type of wall and ceiling Paneling.
- D. Samples for Verification: For each type of wall and ceiling paneling and for each color, pattern, texture, and finish specified, full width by 36 inches (914 mm) long in size.
 - 1. Compressed Straw Panel: From same lot to be used for the Work, with specified finish applied.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each wall and ceiling paneling, for tests performed by a qualified testing agency.
- B. Installation Instructions: Submit manufacturer instructions including surface preparation and installation procedures.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For wall and ceiling panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for installation.
 - 1. Build mockups for each type of wall and ceiling panels on each substrate required.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install wall and ceiling panels until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and HVAC system is operating and maintaining ambient temperature and humidity conditions at levels intended for occupants after Project completion during the remainder of the construction period.
 - 1. Compressed Straw Panels: Condition spaces for not less than 48 hours before installation.
- B. Lighting: Do not install wall paneling until lighting that matches conditions intended for occupants after Project completion is provided on the surfaces to receive wall paneling.
- C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall and ceiling-paneling manufacturer for full drying or curing.

1.9 WARRANTY

- A. Manufacturer's Standard Warranty: Provide manufacturer's standard warrant of 10 years for any product failure.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: As determined by testing identical wall and ceiling panels applied with identical adhesives to substrates in accordance with test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 50 or less.

2.2 COMPRESSED STRAW WALL AND CEILING PANELS

- A. Basis of Design Product: Durranel panels as manufactured by Ortech Industries PTY, LTD. 91 Allingham Street, Golden Square VIC 3555, Australia, web: www.durranel.com
 - 1. Substitution: As per Division 01.
- B. Description: Manufactured from agricultural byproducts into a strong and durable construction material with no binding agents or chemical additives, with face laminated with recycled kraft liner.
 - 1. Thickness: Minimum 2 inches, or as indicated in Drawings.
 - 2. Panel Size: As per manufacturer standard size.
 - 3. Colors: As selected by Architect from manufacturer's full range.
 - 4. Installation Method: As per manufacturer's standard.

5. Thermal Resistance: R Value of 0.62 m²K/W
6. Impact Resistance: High
7. Thermal Conductivity: K value of 0.081 W/MK
8. Compressive Strength: 442.38 kPa
9. VOC Emissions Rate: <0.05 mg/m²/hr.
10. Mold Resistant
11. NRC Rating: Min. 0.85

2.3 ACCESSORIES

- A. Manufacturer standard components as required for complete installation.
- B. Concealed Fastening with Plugs: Aluminum J channels, hat channels, screws, caps, drill bits for fixed and floating points.
- C. Tape: Manufacturer standard tape for covering the seams and joints.
- D. Adhesive: Manufacturer recommended.

2.4 CEILING PANEL ATTACHMENT

- A. Ceiling Tile Adhesive:
 1. TiteBond GREENChoice Acoustical Ceiling Tile Adhesive, manufactured by Franklin International.
 2. Sikabond Construction Adhesive manufactured by Sika USA.
 3. Substitution: As per Division 01
- B. Sealant: As specified in Section 07 92 00"Joint Sealants"

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation surfaces being true in plane and vertical and horizontal alignment, maximum moisture content, and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances that could impair bond of wall paneling, including dirt, oil, grease, mold, and mildew.
- C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
 1. Gypsum Board: Apply primer/sealer as recommended in writing by primer/sealer manufacturer and wall-paneling manufacturer.

2. Painted Surfaces:

- a. Check for pigment bleeding. Apply primer/sealer to areas susceptible to pigment bleeding as recommended in writing by primer/sealer manufacturer.
- b. Sand gloss, semigloss, and eggshell finishes with fine sandpaper.

D. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

E. Measure each ceiling area and establish layout of panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

F. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION OF INTERIOR WALL PANELING

A. Install interior wall paneling as per manufacturer's written information.

B. Anchor panels and sub-framing securely per engineering recommendations and approved Shop Drawings to allow for necessary movement and structural support.

C. Cut and drill panels, confirming fixed and floating points, and locate fastener hole spacing according to manufacturer recommendations.

D. Install plumb, level, and accurately spaced according to manufacturer recommendations and approved submittals and Shop Drawings.

E. Fasten panels with fasteners approved for use with supporting substrate.

F. Maintain 3/8 inch (10 mm) minimum air gap clearance behind panels.

G. Maintain perimeter clearance of 1/4 inch (6 mm), minimum between each panel and to adjacent materials.

H. Fastener and hanging hooks to edge distance within manufacturer recommendation.

3.4 INSTALLATION OF INTERIOR CEILING PANELS

A. Install panel ceilings in accordance with local code requirements and manufacturer's written instructions.

3.5 CLEANING

A. Remove excess adhesive at seams, perimeter edges, and adjacent surfaces.

B. Use cleaning methods recommended in writing by panel manufacturer.

C. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

D. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 84 00

SECTION 09 91 13 - EXTERIOR PAINTING

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. Primers.
 - 2. Finish coatings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include preparation requirements and application instructions.
 - 2. Indicate VOC content.
- B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product Schedule: Use same designations indicated on Drawings and in the Exterior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint Products: Provide 1 gal. (3.8 L) of each material and color applied with a label that clearly states the color, color code and mix design.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.

- a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- 1.6 RETAIN SUBPARAGRAPH BELOW IF THE INTENTION IS TO MAKE AN EXCEPTION TO THE DEFAULT REQUIREMENT IN SECTION DELIVERY, STORAGE, AND HANDLING
- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.
- 1.7 FIELD CONDITIONS
- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
 - B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 PRODUCTS

2.1 PERFORMANE REQUIREMENTS

- A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with the most stringent limited specified in Division 01 and tested and determined compliant per the referenced standards for each material type.

2.2 MANUFACTURERS

- A. Basis of Design Products: Dunn Edwards; their components are specified in this Section.
 1. Acceptable Alternate Manufacturers: Subject to compliance with requirements.
 - a. The Sherwin Williams Co., www.sherwilliams.com
 - b. PPG Architectural Coatings, www.ppgpaints.com
 - c. Substitution: As per Division 01
- B. Manufacturer's proprietary names or catalog numbers are indicated for convenience in identifying products. Manufacturer's complete product catalog description and composition for indicated product names or numbers shall constitute requirements for each product specified. Products shall incorporate all attributes set forth in the manufacturer's catalog description for the specified item, except for such modifications thereto as may be indicated in the Contract Documents.
- C. Source Limitations: Provide paints and finishes from the same manufacturer to the greatest extent possible. Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.
 1. If a single manufacturer cannot provide specified products, minor exceptions will be permitted provided Architect's approval is obtained using the specified procedures for substitutions.
 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
 - a. Substitutions: See Section 01 2510 - Substitutions.

3. Provide product data documenting conformance to specified requirements and provide all specified information as listed above in SUBMITTALS article. Failure to include all information specified is grounds for rejection of substitution.

2.3 PAINT PRODUCTS, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturer for use in paint system and on substrate indicated.

B. Colors: Match Architect's samples.

2.4 PRIMERS

- ### A. Water-Based Bonding Primer: Pigmented, water-based-emulsion primer formulated for exterior use and to promote adhesion of subsequent specified coatings.

2.5 FINISH COATINGS

- ### A. Exterior Latex Paint, Gloss: Water-based, pigmented, acrylic-copolymer-emulsion coating formulated for alkali, mold, microbial, scrub, blocking (sticking of two painted surfaces), and water resistance and for use on exterior, primed, wood and metal trim, sashes, frames, and doors.

1. Gloss Level: As selected by the Architect..

PART 3 EXECUTION

3.1 EXAMINATION

- #### A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- #### B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
 2. Masonry (Clay and Concrete Masonry Units): 12 percent.
 3. Wood: 15 percent.
 4. Portland Cement Plaster: 12 percent.
 5. Gypsum Board: 12 percent.
- #### C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.
- #### D. Exterior Gypsum Board Substrates: Verify that finishing compound is dry and sanded smooth.
- #### E. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers.
- #### F. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 7/NACE No. 4.
 - 4. SSPC-SP 11.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.
- J. Wood Substrates:
 - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
 - 2. Sand surfaces that will be exposed to view, and remove sanding dust.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- K. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 INSTALLATION

- A. Apply paints in accordance with manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Paint entire exposed surface of window frames and sashes.
5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in the Exterior Painting Schedule may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written instructions, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written instructions.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
3. Allow empty paint cans to dry before disposal.
4. Collect waste paint by type and deliver to recycling or collection facility.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE, CEMENTITIOUS SUBSTRATES

- A. Portland Cement Plaster (Stucco) Substrates:
 - 1. Latex System:
 - a. Prime Coat: Matching topcoat.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Exterior latex paint, flat.

3.7 EXTERIOR PAINT SCHEDULE - METAL

- A. If products in this schedule are discontinued or unavailable, submit latest alternate products by the same manufacturer, with letter signed by manufacturer's representative describing the reason for change.
- B. Metal Surfaces: Non-Ferrous Metals and Zinc-Coated (Galvanized) Steel.
 - 1. Semi-Gloss Acrylic-Enamel Finish: Two finish coats over a primer.
 - a. Primer Coat (3.0 mils DFT):
 - b. Intermediate (3.0 mils DFT):
 - c. Final Coats (3.0 mils DFT):
 - 2. Dunn-Edwards Products:
 - a. Krud Kutter Metal Clean and Etch
 - b. ULTRASHIELD ULGM00 Galvanized Metal corrosion inhibitive primer, 2.0 mils D.T.M.
 - c. ARISTOSHIELD Semi-Gloss ASHL50 semi-gloss, 2 coats, 1.5 mils D.T.M. per coat.
 - d. ARISTOSHIELD High-Gloss ASHL70 gloss, 2 coats, 1.5 mils D.T.M. per coat.
 - e. ARISTOSHIELD Interior/Exterior Eggshell Paint ULSH30, 2 coats 1.5 mils D.T.M. per coat.

3.8 EXTERIOR PAINT SCHEDULE – CONCRETE MASONARY UNITS

- A. Latex System :
 - 1. Prime Coat: Exterior, latex block filler.
 - 2. Intermediate Coat: Matching topcoat.
 - 3. Topcoat: Exterior latex paint, As indicated on Drawing.

END OF SECTION 09 91 13

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Primers.
 2. Water-based finish coatings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
1. Include preparation requirements and application instructions.
 2. Indicate VOC content.
- B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 2. Apply coats on Samples in steps to show each coat required for system.
 3. Label each coat of each Sample.
 4. Label each Sample for location and application area.
- C. Product Schedule: Use same designations indicated on Drawings and in the Interior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Paint Products: Provide 1 gal. (3.8 L) of each material and color applied with a label that clearly states color, color code and mix design..

1.4 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with the most stringent limited specified in Division 01 and tested and determined compliant per the referenced standards for each material type.

2.2 MANUFACTURERS

- A. Basis of Design Products: Dunn Edwards; their components are specified in this Section.
 1. Acceptable Alternate Manufacturers: Subject to compliance with requirements.
 - a. The Sherwin Williams Co., www.sherwilliams.com
 - b. Vista Paints, www.vistapaint.com
- B. Manufacturer's proprietary names or catalog numbers are indicated for convenience in identifying products. Manufacturer's complete product catalog description and composition for indicated product names or numbers shall constitute requirements for each product specified. Products shall incorporate all attributes set forth in the manufacturer's catalog description for the specified item, except for such modifications thereto as may be indicated in the Contract Documents.
- C. Source Limitations: Provide paints and finishes from the same manufacturer to the greatest extent possible. Obtain block fillers, primers, and undercoat materials for each system from the same manufacturer as the finish coats.
 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided Architect's approval is obtained using the specified procedures for substitutions.
 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
 - a. Substitutions: See Section 01 25 00 - Substitutions.
 3. Provide product data documenting conformance to specified requirements and provide all specified information as listed above in SUBMITTALS article. Failure to include all information specified is grounds for rejection of substitution.

2.3 PAINT PRODUCTS, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

2.4 PRIMERS

- ### A. Interior/Exterior Latex Block Filler: Water-based, high-solids, emulsion coating formulated to bridge and fill porous surfaces of exterior concrete masonry units in preparation for specified subsequent coatings.

2.5 WATER-BASED FINISH COATS

- ### A. Interior, Latex, Eggshell: Pigmented, water-based paint for use on primed/sealed interior plaster and gypsum board, and on primed wood and metals.

1. Gloss and Sheen Level: Manufacturer's standard eggshell finish.

- ### B. Interior, Latex, Satin: Pigmented, water-based paint for use on primed/sealed interior plaster and gypsum board, and on primed wood and metals.

1. Gloss and Sheen Level: Manufacturer's standard low-sheen finish.

PART 3 EXECUTION

3.1 EXAMINATION

- #### A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- #### B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
 2. Masonry (Clay and CMUs): 12 percent.
 3. Wood: 15 percent.
 4. Gypsum Board: 12 percent.
 5. Plaster: 12 percent.
- #### C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- #### D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- #### E. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- #### A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.

- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 7/NACE No. 4.
 - 4. SSPC-SP 11.
- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

3.3 INSTALLATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in equipment rooms:
 - a. Equipment, including panelboards and switch gear.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.

- d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
2. Paint the following work where exposed in occupied spaces:
- a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

F. Do Not Paint or Finish the Following Items:

1. Items that are factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
2. Items indicated to receive other finishes.
3. Items indicated to remain unfinished.
4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead items.
6. Marble, granite, slate, and other natural stones.
7. Ceramic and other types of tiles.
8. Pre-finished wall, ceiling and floor materials or coverings, unless specifically scheduled for field painting.
9. Floors, unless specifically indicated.
10. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco unless specifically indicated.
11. Glass.
12. Concealed pipes, ducts, and conduits.

3.4 FIELD QUALITY CONTROL

- A. Dry-Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry-film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry-film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional

coats as needed to provide dry-film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 - 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 - 3. Allow empty paint cans to dry before disposal.
 - 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINT SCHEDULE – METAL

- A. If products in this schedule are discontinued or unavailable, submit latest alternate products by the same manufacturer, with letter signed by manufacturer's representative describing the reason for change.
- B. AESS fabrications, handrails, guards, and similar items for high performance finish: Refer to Section 09 96 00 "High Performance Coatings".
- C. Metal Surfaces, All – Catalyzed Epoxy (Gloss Sheen):
 - 1. Acrylic Epoxy Coating "Low VOC" Finish (Gloss Sheen): Two finish coats.
 - a. Clean with phosphoric acid or water based cleaner, remove all oil and debris.
 - b. First Coat: 5 mils DFT.
 - c. Top Coat: 5.0 mils DFT.
 - 2. Dunn-Edwards Products:
 - a. Galvanized Metal Primer: Ultrashield Galvanized Metal Primer USGM00, 2.0 mils DTM.
 - b. All Other Metals, Primer: Bloc-Rust Rust Preventive Primer BRPR00-1 WH or BRPR00-1 RO, 2.0 mils DTM.
 - c. Endura-Coat Low VOC Single Component Industrial Coating ENCT60, 1.5 mils DTM.
 - d. Endura-Coat Low VOC Single Component Industrial Coating ENCT60, 1.5 mils DTM.
- D. Metal Surfaces: Non-Ferrous Metals and Zinc-Coated (Galvanized) Steel.
 - 1. Semi-Gloss Acrylic-Enamel Finish: Two finish coats over a primer.
 - a. Primer Coat: 5.0 - 10.0 mils WFT, 2.0 – 4.0 mils DFT.
 - b. Intermediate: 6.0 - 12.0 mils WFT, 2.5 – 4.0 mils DFT.
 - c. Final Coat: 6.0 - 12.0 mils WFT, 2.5 – 4.0 mils DFT.

2. Dunn-Edwards Products:
 - a. Ultra-Grip Multi-Surface Primer UGPR00 2.0 mils D.T.M.
 - b. Aristoshield Interior/Exterior Urethane Alkyd Semi-Gloss ASHL50 1.5 mils D.T.M.
 - c. Aristoshield Interior/Exterior Urethane Alkyd Semi-Gloss ASHL50 1.5 mils D.T.M.

E. Metal Surfaces: Ferrous Metals- Uncoated:

1. Gloss Acrylic-Enamel Finish (Gloss Level 6): Two finish coats over a primer.
 - a. Primer Coat: 5.0 - 10.0 mils WFT, 2.0 – 4.0 mils DFT.
 - b. Intermediate: 4.0 mils WFT, 1.5 mils DFT.
 - c. Final Coat: 4.0 mils WFT, 1.5 mils DFT.
2. Dunn-Edwards Products:
 - a. Bloc-Rust Rust Preventive Primer BRPR00-1 WH or BRPR00-1 RO, 2.0 mils DTM.
 - b. Endura-Coat Low VOC Single Component Industrial Coating ENCT60, 1.5 mils DTM.
 - c. Endura-Coat Low VOC Single Component Industrial Coating ENCT60, 1.5 mils DTM.

3.7 INTERIOR PAINT SCHEDULE – WOOD

- A. If products in this schedule are discontinued or unavailable, submit latest alternate products by the same manufacturer, with letter signed by manufacturer's representative describing the reason for change.
- B. Interior Wood Glu-lam Beams, Heavy Timbers, Ceiling Planks and similar items for transparent finish: Refer to Section 09 93 00 "Wood Stains & Transparent Finishes".
- C. Wood Substrates: Including wood trim and plywood backboards (Semi-Gloss):
 1. Acrylic-Latex System Finish: Two finish coats over a primer.
 - a. Primer Coat: 4.0 mils WFT, 1.4 mils DFT.
 - b. Intermediate: 4.0 mils WFT, 1.6 mils DFT.
 - c. Final Coat: 4.0 mils WFT, 1.6 mils DFT.
 2. Dunn-Edwards Products:
 - a. Ultra-Grip Multi-Surface Primer UGPR00 2.0 mils D.T.M.
 - b. Spartawall Zero VOC Interior Latex Semi-Gloss, SWLL50, 1.5 mils DTM.
 - c. Spartawall Zero VOC Interior Latex Semi-Gloss, SWLL50, 1.5 mils DTM.

3.8 INTERIOR PAINT SCHEDULE – PLASTER AND GYPSUM BOARD

- A. If products in this schedule are discontinued or unavailable, submit latest alternate products by the same manufacturer, with letter signed by manufacturer's representative describing the reason for change.
- B. Plaster & Gypsum Wallboard (Eggshell Sheen):
 1. Vinyl Acrylic - "Low VOC" Finish: Two finish coats over a primer, verify sheen with Architect.
 - a. Primer Coat*: 4.0 mils WFT, 1.0 mils DFT.
 - b. Intermediate: 4.0 mils WFT, 1.7 mils DFT.
 - c. Final Coat: 4.0 mils WFT, 1.7 mils DFT.
 2. * Dunn-Edwards Products:
 - a. Vinylastic Select Zero VOC Interior Latex Wall Sealer VNLSL00, 2.0 mils DTM.

- b. Spartawall Zero VOC Interior Latex Eggshell, SWLL30, 1.5 mils DTM.
- c. Spartawall Zero VOC Interior Latex Eggshell, SWLL30, 1.5 mils DTM.

Note:* Surfaces that were prepared to a Level 5 Finish, using the Level 5 Primer/Prep Coat (as specified in related section "Gypsum Board) may omit primer coat noted above. Verify with paint manufacture that this primer is compatible with the finish coats as specified.

- C. Gypsum Wallboard/ Compressed Straw Panels and Concrete– Catalyzed Epoxy (Gloss Sheen):
 - 1. Acrylic Epoxy Coating "Low VOC" Finish (Gloss Sheen): Two finish coats over a primer.
 - a. Primer Coat: 4.0 mils WFT, 1.0 mils DFT.
 - b. Intermediate: 2-3.0 mils DFT.
 - c. Top Coat: 2-5.0 mils DFT.
 - 2. Dunn-Edwards Products:
 - a. Primer: Vinylastic Wall Sealer VNPR00 2.0 mils D.T.M.
 - b. Enduracat Pre-Catalyzed, Single Component Epoxy, ENPX60, 1.5 mils DTM.
 - c. Enduracat Pre-Catalyzed, Single Component Epoxy, ENPX60, 1.5 mils DTM.

END OF SECTION 09 91 23

SECTION 09 93 00 -

STAINING AND TRANSPARENT FINISHING

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes surface preparation and the application of wood finishes on indicated substrates:
 - 1. Interior Substrates:
 - a. Interior wood surfaces as designated on Drawings.
- B. Related Requirements
 - 1. Section 09 91 13 "Exterior Painting" for conventional paint systems on exterior substrates.
 - 2. Section 09 91 23 "Interior Painting" for surface preparation and application of conventional paint systems on interior substrates.

1.2 REFERENCES

- A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- B. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California Amendments.

1.3 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- D. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- E. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Samples for Verification: For each type of finish system and in each color and gloss of finish indicated.
 - 1. Architect will select from these options and approve color(s) prior to materials being ordered. Provide number of coats on sample as specified:
 - a. Interior Trim: Two 2-foot long samples of standing or running trim of each profile indicated, in sizes indicated, one for each scheduled species.

- b. Interior Wood: Two 12 inch square samples of panel trim of each type indicated, one for each scheduled species.
 2. All material shall be prepared as required and shall be representative of finished installed work.
 3. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:
1. Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 2. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials from the same production run that match products installed. Package coating materials in unopened, factory-sealed containers for storage and identify with labels describing contents.
1. Coatings Quantity: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.
 - a. Provide two copies of the mixing formula to the Architect in addition to the instructions attached to paint containers.

1.6 CLOSEOUT SUBMITTAL

- A. Submit under provisions of Section 01 77 00.
- B. Warranty: Submit specified warranty.
- C. At completion of Work of this Section, submit manufacturer's or distributor's numbered invoices showing type and quantity of products used on this Project.
- D. Coating Maintenance Manual: Upon conclusion of the project, the contractor and paint manufacturer/supplier for each paint manufacturer used shall furnish a Coating Maintenance Manual.
1. Manual shall include the following.
 - a. Area Summary with Finish Schedule.
 - b. Area Detail designating where each product, color and finish was used.
 - c. Product Data pages.
 - d. Material Safety Data Sheets (MSDS).
 - e. Care and Cleaning instructions.
 - f. Touch-up procedures.
 - g. Color samples of each color and finish used.

1.7 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each finish system indicated and each color selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each type of finish system and substrate.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 2. Final approval of stain color selections will be based on mockups.

- a. If preliminary stain color selections are not approved, apply additional mockups of additional stain colors selected by Architect at no added cost to Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.9 PROJECT CONDITIONS

- A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 deg F and 95 deg F (10 and 35 deg C).
- B. Do not apply finishes when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior finishes in rain, fog, or mist.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles for the category indicated.
 1. Substitutions: See Section 01 25 10.

2.2 MATERIALS, GENERAL

- A. Material Compatibility:
 1. Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.
- B. VOC Content of Field-Applied Interior Stains and Transparent Finishes: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to primers, stains, and transparent finishes that are applied in a fabrication or finishing shop:
 1. Stains: VOC not more than 100 g/L.
 2. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
 3. Shellacs, Clear: VOC not more than 730 g/L.
 4. Flat Primers: VOC content of not more than 50 g/L.

2.3 WOOD FILLERS

- A. Wood Filler Paste: MPI #91, or similar, compatible with the water repellent wood stain.
 1. VOC Content: E Range of E2.
 2. Match color of wood species.
 3. Shop-applied products as recommended by staining manufacturer

2.4 STAINS

- A. Stain, Water-Based, Semi-Transparent, for Interior Wood :
 - 1. OKON Weather Pro; OK-128.
 - 2. Minwax® Wood Finish™.
 - 3. ZENITH™ LWS0750 by Valspar.
 - 4. Technical Properties:
 - a. VOC Content: Equal to or < 250g/L.
 - b. Generic Type: Modified Acrylic Emulsion.
 - c. Product Type: Water based.
 - d. Pigment Quantity: 1.2 percent minimum by weight.
 - e. Volume Solids: 15 percent, minimum by weight.
 - f. Breathable: Yes, ASTM 1653.
 - g. Flash Point: N/A.

2.5 LACQUER

- A. Lacquer, Water-Based, Transparent, for Interior Wood.
 - 1. SafeCoat Acrylacq manufactured by AFM
 - 2. Properties:
 - a. VOC Content: 99 g/L.
 - b. Product Type: Water-based.
 - c. Gloss: Satin.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Maximum Moisture Content of Interior Wood Substrates: 13 percent, when measured with an electronic moisture meter.
- C. Proceed with finish application only after unsatisfactory conditions have been corrected.
 - 1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be finished. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 - 1. After completing finishing operations, reinstall items that were removed; use workers skilled in the trades involved. Remove surface-applied protection if any.
- C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Remove surface dirt, oil, or grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps exposed to view and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.

D. Interior Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.
3. Before priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
4. Sand surfaces that will be exposed to view and dust off.
5. Prime edges, ends, faces, undersides, and backsides of wood.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions.
 1. Use applicators and techniques suited for finish and substrate indicated.
 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

END OF SECTION 09 93 00

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SECTION 09 97 23 -

CONCRETE SEALERS AND COATINGS

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. Provide a complete sealed concrete floor system that meet the requirements for specific use indicated in the contract documents.
 - 2. Include all applicable substrate testing, surface preparation, and detail work.

1.3 RELATED SECTIONS

- A. Section 03 30 00 "Cast-In-Place Concrete".

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product data sheets on each product and system to be used including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Selection Samples: For each system specified, provide two samples, representing manufacturer's full range of colors.

1.5 QUALITY ASSURANCE

- A. All materials used on the sealed concrete floor system shall be manufactured and provided by a single manufacturer to ensure compatibility and proper bonding.
- B. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this section.
- C. Contractor shall have a minimum of 3 years experience installing concrete floor coatings similar to that which is required for this project and who is acceptable to the manufacturer.
 - 1. Applicator shall designate a single individual as project foreman who shall be on site at all times during installation.
 - 2. Contractor must show and have QCA Qualified Contractor/Applicator paperwork from the manufacturer of the coating system.

- D. Convene a pre-application meeting before the start of application of coating system. Require attendance of parties directly affecting work of this section, including: Architect, contractor, applicator, and authorized representative of the coating system manufacturer and interfacing trades. Review the following:
1. Drawings and specifications affecting work of this section.
 2. Protection of adjacent surfaces.
 3. Surface preparation and substrate conditions.
 4. Application.
 5. Field quality control.
 6. Cleaning.
 7. Protection of coating system.
 8. Repair of coating system.
 9. Coordination with other work.

1.6 DELIVERY, STORAGE & HANDLING

- A. Materials shall be delivered to the job site in sealed, undamaged containers. Each container shall be clearly marked with manufacturer's label showing type of material, color, and lot number.
- B. Store all materials in a clean, dry place with a temperature range in accordance with manufacturer's instructions
- C. Handle products carefully to avoid damage to the containers. Read all labels and Material Safety Data Sheets prior to use.

1.7 PROJECT SITE CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended by the manufacturer.
- B. Schedule coating work to avoid excessive dust and airborne contaminants. Protect work areas from excessive dust and airborne contaminants during coating application.
- C. All concrete should be tested for moisture before applying a seamless coating. If moisture emissions exceed 5 lbs/1000 square feet (ASTM F1869) or if the relative humidity (RH) exceeds 75% (ASTM F2170), contact the manufacturer before application.
- D. Concrete must be at least 2500 psi.
- E. Concrete must be cured for a minimum of 28 days before coating is applied
- F. Before any work is started, the applicator shall examine all surfaces for any deficiencies. Should any deficiencies exist, the architect, owner or general contractor shall be notified in writing and any corrections necessary shall be made.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Type: Water-based acrylic polymer sealer/lacquer.
- B. Finish: High-gloss, clear "wet look."
- C. VOC Content: < 50 g/L.

- D. Slip Resistance: Coefficient of friction ≥ 0.6 (ASTM D2047).
- E. Color: Clear

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions.
 - 1. Inspect all surfaces to receive sealed concrete flooring. Concrete must be clean, dry and free of grease, paint, oil, dust, curing agents, laitance or any foreign material that will prevent proper adhesion.
 - 2. Before starting work, report in writing to the authority having jurisdiction any unsatisfactory conditions.

3.2 SURFACE PREPARATION

- A. Prepare surfaces using methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- B. Create a surface profile by mechanically diamond grinding the surface with 60-80 grit tools to achieve a clean uniform surface.
- C. Sweep and vacuum surfaces entirely prior to installation.
- D. Rout and clean moving cracks and joints: patch with manufacturer's recommended concrete patch material.
- E. Repair any non-moving surface deviations with manufacturer's recommended patching material.

3.3 INSTALLATION

- A. Install coatings in accordance with manufacturer's instructions.
- B. Mix multi-component materials in accordance with manufacturer's instructions.
- C. Use application equipment, tools, and techniques in accordance with manufacturer's instructions.
- D. Uniformly apply coatings at spread rates and in number of coats to achieve specified coverage rates recommended by the manufacturer.
- E. Adhere to all limitations, instructions, and cautions for sealed concrete floor coating as stated in the manufacturer's published literature.

3.4 FIELD QUALITY CONTROL

- A. Verify coatings and other materials are as specified.
- B. Verify coverages of the system as work progresses. Areas found not to meet the required coverage rates shall receive additional material until specified coverage is attained.
- C. Manufacturer's representative shall provide technical assistance and guidance for surface preparation and application of coating systems.

3.5 PROTECTION AND CLEAN-UP

- A. Installation areas must be kept free from traffic and other trades during the application procedure and cure time.

- B. Protect finished surfaces of coating system from damage during construction.
- C. Touch-up, repair or replace damaged flooring system after substantial completion.
- D. Clean area and remove all debris upon completion of work. Dispose of empty containers properly according to current Local, State and Federal regulations.

3.6 MAINTENANCE

- A. Contractor shall provide to owner, maintenance and cleaning instructions for the floor system upon completion of work. Owner is required to clean and maintain the surfaces to maintain manufacture's warranty.

END OF SECTION 09 97 23

SECTION 10 14 00 - SIGNAGE

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. Room identification.
 - 2. Accessibility signage.
 - 3. Directional and informational signage.
 - 4. Fabricating and furnishing non-illuminated traffic, directional, and ADA sign panels for exterior use on the site.
 - 5. Installation of signs including sign panels, fastening hardware, and metal posts.
- B. Related Requirements:
 - 1. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
 - 2. Section 06 10 53 "Miscellaneous Rough carpentry"
 - 3. Section 08 14 00 "Wood Doors"
 - 4. Section 09 22 16 "Non-Structural Metal Framing" for backing to support signage at metal framing.
 - 5. Section 09 29 00 "Gypsum Board"

1.3 REFERENCES

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code with California Amendments.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."
- C. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; Federal Register, July 26, 1991; updated 2010.
- D. Standard Specifications for the Department of Transportation, State of California (Caltrans), 2018 Section 82, Signs and Markers.
- E. Regulatory requirements for accessibility signage: California Code of Regulations, California Building Code, Title 24, Part 2, Chapter 11.

1.4 DEFINITIONS

- A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
1. Manufacturer's standard construction details, including materials, dimensions of individual components, profiles, and finishes for each type of sign required. Provide manufacturer's recommendations for maintenance and cleaning requirements for interior sign surfaces.
- B. Shop Drawings: Submit for each type of sign. Include the following:
1. Signage Plan: Contractor-generated building plans showing the locations of signs. The exact final locations of signs shall be directed by the Owner and as required by code. Contractor shall arrange for meeting at the Project site to accommodate the Owner's direction of final locations.
 - a. Use same sign designations in submittals as indicated on Contractor's Sign Types Drawing.
 2. Sign Elevations.
 3. Details of fabrication, attachment and erection.
 4. Include materials, shapes, dimensions, finishes, wind loads, anchorage, and method of connections.
 5. Show letter spacing and dimensions of letter heights.
 6. Anchors, accessories, layout, and installation details.
 7. Submit message list for each sign to be provided, including large-scale details of wording and layout of lettering.
 8. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
- C. Samples: Provide three sets, nonreturnable, of the following samples of each sign type for verification of compliance with requirements indicated.
1. Material Samples: For verification of color, pattern, and texture selected, and compliance with requirements indicated.
 - a. Acrylic Sheet: Provide a sample panel not less than 8-1/2-inches by 11-inches with a representative sample of graphic image required, showing graphic style, and colors and finishes of letters, numbers, and other graphic devices.
 - b. Vinyl Film: Samples of each decal type, not less than 4-inches square.
 2. Submit full-size patterns of each sign type with solid black letterforms and graphic elements of a white background with sign face outlined. Typography must be represented in exact typeface and letter spacing specified either as film positives to photocopies produced from camera-ready artwork or typesetting or as pen plots when computer-cut lettering is specified. Graphic elements must be represented either by film positives or photocopies produced from camera-ready artwork.
 3. Submit non-returnable samples of each lettering type, finish, color and exposed material to be used in the Work.
- D. Qualification Data:
1. For fabricator and installer.

- E. Operations and Maintenance Data: Submit instructions for maintenance tasks, including cleaning and repair, within the capabilities of Owner's maintenance staff.
- F. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

- A. Installer's Qualifications: Installer shall be either the fabricator or a firm approved by the fabricator which specializes in installation of interior signage, having a minimum of 5 years full time experience installing signage of similar scope and complexity.
- B. Fabricators Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for the Project and whose products have a record of successful in-service performance.
- C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.
- D. Regulatory Requirements: Comply with applicable provision in Chapter 11 of the latest version of the California Building Code

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

1.8 PROJECT COORDINATION

- A. Meet with Owner and confirm in writing all room numbers, copy and layout, and sign quantities prior to production.

1.9 WARRANTY

- A. Signing Warranty:
 - 1. Submit a 5-year written warranty, effective the date of Completion of the Work, signed by the sign subcontractor and installer, agreeing to repair or replace work at no cost to the Client that has failed as a result of defects in materials or workmanship or installation. Upon notification of such defects, within the warranty period, make necessary repairs or replacement at the convenience of the Client or client's design consultant.
- B. Polyurethane Acrylic Paint Factory Finish Warranty:
 - 1. Submit a 5-year written warranty, warranting that the factory-applied linear polyurethane finishes will not develop excessive fading or excessive non-uniformity of color or shade, and will not crack, peel, pit, corrode or otherwise fail as a result of defects in materials or workmanship within the following defined limits. Upon notification of such defects, within the warranty period, make necessary repairs or replacement at no cost to the Client at the convenience and approval of the Client or client's design consultant.
- C. The Sign Fabricator shall strictly adhere to the fabrication and application specifications of all applied materials of manufacturer to ensure the full five (5) year contractual warranty and the full five (5) year manufacture warranty.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in related section.
- B. Regulatory Requirements: Comply with applicable provisions in the following:
 - 1. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; Federal Register, July 26, 1991; updated 2010.
 - 2. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
 - 3. ICC/ANSI A117.1.
 - 4. In case of conflict, follow the more stringent requirements.

2.2 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Products described below and identified by product name, model number, or other manufacturer designation, are Basis of Design Products. Basis of Design Products establish the standards of type, function, dimension, in-service performance, physical properties, appearance, warranty, cost, and other characteristics required by the Project. The Project's design is based on the Basis-of-Design Products specified.
 - 2. Substitutions: As approved by Architect in writing.
 - a. The burden of proof of equality of proposed products is on the Contractor.
 - 3. If "No Substitutions" is indicated next to the product name, provide only products of listed manufacturers.

2.3 SIGN MATERIALS

- A. Cast Acrylic Sheet: ASTM D4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).
- B. Colored Coatings for Acrylic Plastic Sheet: As recommended by acrylic manufacturers, including inks and paints for copy and background colors, for optimum adherence to acrylic surface and that are non-fading for application indented.
- C. Vinyl Film: Opaque non-reflective vinyl film, 0.0036-inch minimum thickness, with pressure-sensitive adhesive backing, suitable for exterior as well as interior applications.

2.4 ACRYLIC PLAQUE SIGNS

- A. Acrylic Signage: Signs complying with requirements of CBC Section 11B
- B. Acceptable Manufacturers:
 - 1. ASI Sign Systems, Inc.; www.asisignage.com
 - 2. Toji www.4adasigns.com
 - 3. Gemini Signs www.geminisigns.com
 - 4. Vomar Products www.vomarproducts.com
 - 5. Mohawk Sign Systems, www.mohawksign.com .
 - 6. A Good Sign www.agoodsign.com
 - 7. Or Approved Equal

- C. Toilet Room Door Signage: Shop fabricated signs with pictograms as indicated on the Drawings.
 - 1. Sizes: As indicated on Drawings.
 - a. At Gender Neutral, provide circle and inscribed equilateral triangle with international male and female figures.

- D. Room Occupancy Signage: Shop fabricated signs with maximum occupancy numbers as indicated on Drawings.
 - 1. Size: As indicated on Drawings.
 - 2. Colors: As indicated on Drawings.

2.5 APPLIED VINYL SYMBOLS

- A. Basis of Design: ADA signage on glass surface using Scotchcal ElectroCut Graphic Vinyl Film, Series 7725, manufactured by 3M, or equal.
 - 1. Code-Required Decals on or Adjacent to Doors: Stock, preprinted decal, complying with CBC Section 11B requirements, with International Symbol of Accessibility.
 - 2. Size: As indicated on Drawings.
 - 3. Color: As indicated on Drawings.
 - 4. Adhesive type: Pressure sensitive.

2.6 SIGN PANELS EXTERIOR:

- A. Single Sheet Aluminum: Shall comply with ASTM B209 and be pretreated for corrosion resistance under ASTM B449. Aluminum must be aluminum alloy 6061-T6 or 5052-H38.
- B. Finish:
 - 1. Parking Lot Signage: reflectorized, code-compliant, heavy-duty vinyl or similar sheeting
 - 2. Other Site Locations: baked enamel finish
- C. Mounted to galvanized steel post set in 36-inch by 12-inch, 2500 PSI concrete footing.
- D. Obtain tow away phone numbers from District.

2.7 SIGNAGE CHARACTERS

- A. Character (Letter and Number) Style: Characters size as indicated on the Drawings or, if not indicated, comply with CBC. Character style shall be Sans Serif uppercase letters, accompanied by Contracted Grade 2 Braille. Lettering to be raised minimum 1/32 inches (0.794 mm) above sign surface.

2.8 BRAILLE

- A. Braille Indicators: On surface of signs where required, provide Braille symbols corresponding to sign text, in compliance with CBC Section 11B. Braille symbols to be Contracted Grade 2, with dots 1/10 inch (2.54 mm) on centers within each cell and 2/10 inch (5.08 mm) space between cells. Dots to be raised a minimum of 1/40 inch (0.635 mm) above background, domed or rounded.

2.9 FABRICATION

- A. Fabricate all work in accordance with the approved Shop Drawings.
- B. All cutting, fabrication and assembly to be done in the factory and shipped to the job site as one complete unit, unless approved by the Owner.

- C. All priming, surface preparation and paint application to be in accordance with the manufacturer's written data, description and instructions for that type of material.
- D. All signs to be flat, true and free of waviness.

2.10 FINISHES, GENERAL

- A. All finishes, including coatings, shall be non-glare to meet requirements of CBC 11B.
- B. Metal Finishes:
 - 1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 2. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work:
 - 1. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.

2.11 FINISHING MATERIALS

- A. Acrylic Polyurethane Paints: Factory applied baked acrylic polyurethane enamel paint that is UV resistant.
 - 1. Basis-of-Design Manufacturer: Matthews Paint (MPC); www.mathewspaint.com.
 - a. Substitutions: Refer to Section 01 25 10.
- B. Silk Screening Materials:
 - 1. Provide photo processed screening, arranged to furnish sharp and solid images without edge build-up or bleeding of the coating. Pattern-cut screens may be used for non-repeat copy, provided that final image copy is equal to photo screen quality. Provide only non-glare weather-resistant coating materials, compatible with the intended substrates.
- C. Vinyl Die-Cut and Pattern Cut-out Graphics:
 - 1. Use pressure-sensitive, non-yellowing, non-peeling and weather resistant vinyls as specified.

2.12 ACCESSORIES

- A. Mounting Methods:
 - 1. Use concealed fasteners or other products for attachment indicated fabricated from materials that are not corrosive to sign material and mounting surface.
- B. Adhesive: Provided or recommended by manufacturer; compatible with substrates.
 - 1. Comply with VOC content limits specified in related section.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with installer present, for compliance with requirements for levelness, wall plumbness, and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Perform work in cooperation with other trades and verify size, location and placement of all signage. Coordinate field measurements and Shop Drawings with fabrication and shop assembly.
- B. Where adhesive is specified, only adhesives specifically recommended by the manufacturer for compatibility with the base materials and adhesive strength shall be used.
- C. Sign faces and material shall utilize proper adhesives and shall be smooth, consistent, free of bubbles, bulging and foreign matter.
- D. All finished work shall be non-glare, smooth, free of scratches, gouges and other imperfections. Sign edges shall be straight, smooth, free of cutting marks and other defects.
- E. Restore all adjoining structures and surfaces of finishes where damaged or soiled by the sign installation. Restoration shall be performed by the Sign Fabricator or by original Trades if requested by the Owner.
- F. Repair and replace materials or signs damaged during installation.
- G. Retain protective coverings on signage and remove only when there is no possibility of damage from other work to be performed at the same location.

3.3 SIGNAGE INSTALLATION

- A. Locate signage and accessories as indicated on the Drawings and as directed by Owner. Install signage using mounting methods of the type described and in compliance with the manufacturer's instructions and recommendations.
 - 1. Layout: Conform to layout information on reviewed shop drawings and as generally indicated on the Drawings. Locate signage to coordinate with joints and panel edges of substrate construction.
 - 2. Fastening: Secure signage to substrate with anchoring method and fasteners as specified and as recommended by signage manufacturer. Make all penetrations of building envelope watertight.
 - 3. Alignment: Install signage level, plumb, and at the height indicated, with sign surfaces free from distortion or other effects in appearance.
 - 4. All signage is to be clean and free of all glue, tape and other extraneous materials.
 - 5. All signage is to be free of fabricator's logo or identification.
- B. Wall-Mounted Signs:
 - 1. Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
 - 2. Interior Sign Anchorage:
 - a. Two-Sided Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
 - b. Silicone Adhesive Mounting: Attach signs to irregular, porous, or vinyl-covered surfaces.
 - 3. Signs Mounted on Glass: Provide black opaque decal, matching in size, on opposite side of glass to conceal mounting materials.

3.4 CLEANING

- A. All debris relating to signage installation must be removed from the areas of the project after completion of the installation phase.
- B. Provide in writing any specific signage maintenance specifications or up keep instructions to the Client. This information relates specifically to the needs of all provided sign types contained in this document.

3.5 SIGNAGE SCHEDULE

- A. Actual room names and numbers to be used by school will change from the construction documents. The contractor is to update, at no additional cost, any submittal and or shop drawings necessary to reflect this change. This include but is not limited to fire alarm, electrical, signage, HVAC, telecom, and any other applicable discipline.
- B. Primary Room Identification Signs: Acrylic plaques.
- C. Exit Identification Signs: Acrylic plaques.
- D. Toilet Room Identification Signs: Acrylic plaques.
- E. Toilet Room Door Signs: Acrylic plaques.
- F. Maximum Occupancy Signs: Acrylic plaques.
- G. Accessible Entry Identification Signs: Vinyl film.
- H. Refer to Drawings for additional signage.

END OF SECTION 10 14 00

SECTION 10 28 00 –

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Public-use washroom accessories.
 - 2. Private-use bathroom accessories.
- B. Related Requirements:
 - 1. Section 08 83 00 "Mirrors" for frameless mirrors.

1.2 COORDINATION

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

1.3 ACTION SUBMITTALS

- A. Product Data: For each product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
- B. Samples: For each exposed product and for each finish specified, full size.
 - 1. Approved full-size Samples will be returned and may be used in the Work.
- C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For manufacturer's special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For accessories to include in maintenance manuals.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design accessories and fasteners to comply with the following requirements:
 - 1. Grab Bars: Installed units are able to resist 250 lbf (1112 N) concentrated load applied in any direction and at any point.
 - 2. Shower Seats: Installed units are able to resist 360 lbf (1601 N) concentrated load applied in any direction and at any point.

2.2 MANUFACTURERS

- A. Basis of Design Manufacturer: Bobrick, web: www.bobrick.com.
- B. Other Acceptable Manufacturers: Subject to compliance with requirements, provide acceptable product form one of the following manufacturers:
 - 1. Bradley Corporation
 - 2. American Specialties, Inc.
 - 3. Substitution: As per Division 01

2.3 PUBLIC-USE WASHROOM ACCESSORIES

- A. Source Limitations: Obtain each type of public-use washroom accessory from single source from single manufacturer.
- B. Toilet Tissue (Roll) Dispenser:
 - 1. Description: Single-roll dispenser.
 - 2. Mounting: Recessed.
 - 3. Operation: Noncontrol delivery with theft-resistant spindle.
 - 4. Capacity: Designed for 4-1/2- or 5-inch- (114- or 127-mm-) diameter tissue rolls.
 - 5. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
- C. Grab Bar:
 - 1. Mounting: Flanges with concealed fasteners.
 - 2. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
 - a. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin) on ends and slip-resistant texture in grip area.
 - 3. OD: 1-1/4 inches (32 mm).
 - 4. Configuration and Length: As indicated on Drawings.
- D. Seat-Cover Dispenser:
 - 1. Mounting: Recessed.
 - 2. Minimum Capacity: 250 seat covers.
 - 3. Exposed Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
 - 4. Lockset: Tumbler type.
- E. Shelf:

1. Description: Fixed rectangular unit.
2. Nominal Size: As indicated on Drawings.
3. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

F. Hook:

1. Description: Coat hook
2. Mounting: Exposed.
3. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

2.4 PRIVATE-USE BATHROOM ACCESSORIES

A. Source Limitations: Obtain each type of private-use bathroom accessory from single source from single manufacturer.

B. Private-Use Toilet Tissue Dispenser:

1. Description: Single-roll dispenser with the following features:
 - a. Hood.
2. Mounting: Recessed.
3. Capacity: Designed for 4-1/2- or 5-inch- (114- or 127-mm-) diameter tissue rolls.
4. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

C. Grab Bar:

1. Mounting: Flanges with concealed fasteners.
2. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
 - a. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin) on ends and slip-resistant texture in grip area.
3. OD: 1-1/4 inches (32 mm).
4. Configuration and Length: As indicated on Drawings.

D. Private-Use Roll-In Shower

1. Description: Barrier free, one piece shower area, with slip resistant floor and smooth wall finish. Unit shall be ADA compliant.
2. Accessories:
 - a. Shower seat.
 - b. Curtain rod and shower curtain.
 - c. Grab bar.
 - d. Floor drain.
3. Dimensions: As indicated on Drawings.
4. Material and Finish: As per manufacturers standard finishes.

E. Private-Use Hook:

1. Description: Single-prong unit.
2. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

F. Private-Use Shelf:

1. Description: Surface-mounted shelf
2. Length: As indicated on Drawings.
3. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

2.5 MATERIALS

- A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.031-inch- (0.8-mm-) minimum nominal thickness unless otherwise indicated.
- B. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.

2.6 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of [six] <Insert number> keys to Owner's representative.

PART 3 EXECUTION

3.1 INSTALLATION OF TOILET, BATH, AND LAUNDRY ACCESSORIES

- A. Install accessories in accordance with manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
 1. Remove temporary labels and protective coatings.
- B. Grab Bars: Install to comply with specified structural-performance requirements.
- C. Shower Seats: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Clean and polish exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION 10 28 00

SECTION 10 44 13 – FIRE PROTECTION CABINETS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-protection cabinets for the following:
 - a. Portable fire extinguisher.

B. Related Requirements:

1. Section 10 44 16 "Fire Extinguishers" for portable, hand-carried fire extinguishers accommodated by fire-protection cabinets.

1.2 REFERENCES

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."
- C. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; Federal Register, July 26, 1991; updated 2010.

1.3 PREINSTALLATION CONFERENCE

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to fire-protection cabinets, including, but not limited to, the following:
 - a. Schedules and coordination requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.
2. Include fire rated listing information for fire rated, fire protected cabinets.

B. Shop Drawings: For fire-protection cabinets.

1. Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Initial Selection: For each type of exposed finish required.

- D. Samples for Verification: For each type of exposed finish required, prepared on samples 6 by 6 inches (150 by 150 mm) square.
- E. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semirecessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.6 COORDINATION

- A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain fire-protection cabinets, accessories, and fire extinguishers from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

2.3 FIRE-PROTECTION CABINET

- A. Fire-Protection Cabinet Type: Suitable for fire extinguisher.
- B. Cabinet Construction: One-hour fire rated.
 - 1. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch- (1.09-mm-) thick cold-rolled steel sheet lined with minimum 5/8-inch- (16-mm-) thick fire-barrier material. Provide factory-drilled mounting holes.
- C. Cabinet Material: Cold-rolled steel sheet.
 - 1. Shelf: Same metal and finish as cabinet.
- D. Surface-Mounted Cabinet: Cabinet box fully exposed and mounted directly on wall with no trim.
- E. Cabinet Trim Material: Same material and finish as door.
- F. Door Material: Steel sheet.
- G. Door Style: Fully glazed, frameless, backless, acrylic panel.
- H. Door Glazing: Acrylic sheet.
 - 1. Acrylic Sheet Color:
 - a. Clear transparent acrylic sheet.
- I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide projecting lever handle with cam-action latch.
2. Provide continuous hinge, of same material and finish as trim,, permitting door to open 180 degrees.

J. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect.
 - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet door.
 - 2) Lettering Color: Red.
 - 3) Orientation: As indicated on Drawings.

K. Materials:

1. Cold-Rolled Steel: ASTM A1008/A1008M, Commercial Steel (CS), Type B.
 - a. Finish: Baked enamel, TGIC polyester powder coat, HAA polyester powder coat, epoxy powder coat, or polyester/epoxy hybrid powder coat, complying with AAMA 2603.
 - b. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - c. Color: As selected by Architect from manufacturer's full range.
2. Transparent Acrylic Sheet: ASTM D4802, Category A-1 (cell-cast sheet), 3 mm thick, with Finish 1 (smooth or polished).

2.4 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
1. Weld joints and grind smooth.
 2. Miter corners and grind smooth.
 3. Provide factory-drilled mounting holes.
 4. Prepare doors and frames to receive locks.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.
1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
 2. Fabricate door frames of one-piece construction with edges flanged.
 3. Miter and weld perimeter door frames and grind smooth.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.5 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish fire-protection cabinets after assembly.
- D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where cabinets will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for **[recessed]** **[and]** **[semirecessed]** fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION OF FIRE-PROTECTION CABINETS

- A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
 - 1. Fire-Protection Cabinet Mounting Height: 42 inches (1067 mm) above finished floor to top of fire extinguisher.
- B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semirecessed fire-protection cabinets.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.
- E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 44 13

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SECTION 10 44 16 – FIRE EXTINGUISHERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.
- B. Related Requirements:
 - 1. Section 10 44 13 "Fire Protection Cabinets."

1.2 REFERENCES

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."
- C. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; Federal Register, July 26, 1991; updated 2010.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to fire extinguishers including, but not limited to, the following:
 - a. Schedules and coordination requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.
- B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.7 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

- 1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
 - b. Faulty operation of valves or release levers.
- 2. Warranty Period: Six years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 - 1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Larsen's Manufacturing Company
 - b. Ansul.
 - c. J. L. Industries, Inc.; a division of Activar Construction Products Group.
 - d. Amerex Corporation.
 - e. Substitution: Per Division 01
 - 2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
 - 3. Valves: Manufacturer's standard.
 - 4. Handles and Levers: Manufacturer's standard.
 - 5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.
- B. Multipurpose Dry-Chemical Type in Steel Container : UL-rated 2-A:10-B:C, 5-lb (2.3-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

- C. Carbon Dioxide Type : UL-rated 10-B:C, 15-lb (6.8-kg) nominal capacity, with carbon dioxide in manufacturer's standard enameled-metal container.

2.3 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Larsen's Manufacturing Company
 - b. Ansul.
 - c. J. L. Industries, Inc.; a division of Activar Construction Products Group.
 - d. Amerex Corporation.
 - e. Substitution: Per Division 01
- 2. Source Limitations: Obtain mounting brackets and fire extinguishers from single source from single manufacturer.

- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

- 1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
 - a. Orientation: Vertical.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
- B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.
 - 1. Mounting Height: Top of fire extinguisher to be at 42 inches (1067 mm) above finished floor.

END OF SECTION 10 44 16

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SECTION 10 81 13 - BIRD CONTROL SYSTEMS

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. Open metal lathe

1.3 RELATED SECTIONS

- A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 04 20 00 "Unit Masonry" for the metal lathe to go on top of unit masonry.
- C. Section 07 41 13.13 "Formed Metal Roof Panels".

1.4 REFERENCES

- A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".
- B. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions, recommendations and other descriptive material.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Shop Drawings: Include;
 - 1. Plans
 - 2. Elevations
 - 3. Sections
 - 4. Details
 - 5. Attachments to other work.
- C. Samples: For each type of hardware, wire, fastener, etc. and finish specified, two samples, representing actual product, color, and patterns.
- D. Closeout Submittals:
 - 1. Warranty: Submit specified warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.
- B. Installer Qualifications:
 - 1. All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
 - 2. Utilize labor or specific installed manufacturers authorized installers who are knowledgeable in the manufacturer's product.
 - 3. Installer shall visit site to gather all information of existing site conditions.
 - 4. Shall be a certified installation company.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.8 PROJECT CONDITIONS

- A. Furnish all anchoring devices required to fasten system to and around building structure.
 - 1. Coordinate installation with existing conditions and site tolerances.
- B. Visit site and field measure prior to fabrication and delivery of materials.

1.9 WARRANTY

- A. Provide executed copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.
 - 1. Installation Warranty: Two (2) years.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. VOC Limits for adhesives sealants, fillers, coatings and primers. Comply with limits specified in referenced Section.

2.2 MANUFACTURERS

- A. Source Limitations: Provide products from one manufacturer for entire project.

2.3 BIRD CONTROL SYSTEMS

- A. Acceptable Manufacturers:
 - 1. Bird Barrier.
 - 2. Bird B Gone
 - 3. Substitution: As per Division 01.
- B. Material: 19 gauge, A606 steel wire mesh, U.V. stabilized.
 - 1. Color: Black.
 - 2. Sizes: ½ inch square wire mesh.
 - 3. Roll Size: As per manufactures standard.

- C. Posts: Stainless steel, 316 marine grade, 4 mm diameter, with ends beveled to aid with installation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Visually inspect the surfaces that will receive the mesh and all areas that will end up behind or inside the installation. Note damaged surfaces or incomplete construction that could compromise the bird mesh control installation.
- B. Note any objects or conditions that could damage the installed bird control system.
- C. Do not begin installation until substrates have been properly prepared.
- D. Notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Surface should be thoroughly cleaned and free of bird droppings, nesting materials, rust, peeling paint or other debris.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Field Measurements: Verify the dimensions for each area specified for enclosure.

3.3 INSTALLATION

- A. Make sure the installation surfaces are clean, dry and free of any debris or obstructions.
- B. Install the mesh as per manufacturers written instructions.
- C. Mesh should be secured to the posts and the roofing above.
- D. Use adhesives or other attaching systems as recommended by manufacturer to attach the mesh to CMU surface.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 10 81 13

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SECTION 11 30 13 – APPLIANCES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Refrigeration appliances.
 - 2. Cleaning appliances.
- B. Related Requirements:
 - 1. Section 22 41 00 "Residential Plumbing Fixtures" for kitchen sinks, dishwasher air-gap fittings, under sink disposal, shower units, and instant hot-water dispensers.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.
- C. Product Schedule: For appliances. Use same designations indicated on Drawings.
- D. Qualification Data: For manufacturer.
- E. Product Certificates: For each type of appliance.
- F. Field quality-control reports.
- G. Sample Warranties: For manufacturers' special warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Maintains, within reasonable limits of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

1.6 WARRANTY

- A. Special Warranties: Manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- B. Refrigerator, Freezer, Sealed System: Full warranty, including parts and labor, for on-site service on the product.
 - 1. Warranty Period for Sealed Refrigeration System: Five years from date of Substantial Completion.
 - 2. Warranty Period for Other Components: Two years from date of Substantial Completion.
- C. Dishwasher: Full warranty, including parts and labor, for on-site service on the product.
 - 1. Warranty Period for Deterioration of Tub and Metal Door Liner: 10 years from date of Substantial Completion.
 - 2. Warranty Period for Other Components: Two years from date of Substantial Completion.
- D. Clothes Washer: Full warranty, including parts and labor, for on-site service on the product.
 - 1. Warranty Period: Three years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain residential appliances from single source manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design and ICC A117.1.

2.3 MANUFACTURES

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide product from one of the following manufacturers:
 - 1. True Manufacturing Co., Inc., web: www.truemfg.com.
 - 2. Speed queen, web: www.speedqueencommercial.com.
 - 3. Moyer Diebel, web: www.moyerdiebel.com
 - 4. LG, web: www.lg.com
 - 5. Bosch, web: www.bosch-home.com

2.4 REFRIGERATION APPLIANCES

- A. Refrigerator: Dual door refrigerator and complying with AHAM HRF-1. Retain subparagraphs below to suit Project; available characteristics, options, and features vary with manufacturer and product.
 - 1. Basis of Desing Product: TS series, Model number TS-49-HC as manufactured by True Manufacturing Co., Inc., web: www.truemfg.com

- a. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers:
 - 1) LG
 - 2) Bosch
 - 3) Substitution: As per Division 01.
 2. Type: Freestanding.
 3. Dimensions: As indicated on Drawings.
 4. Storage Capacity:
 - a. Refrigeration Compartment Volume: As per manufacturer's standard volume.
 - b. Shelf Area: Six adjustable, heavy duty PVC coated gray wire shelves, 24 9/16" by 22 3/8".
 5. Features:
 - a. Cabinet Construction:
 - 1) Exterior - Stainless steel doors, front and sides. Corrosion resistant GalFan coated steel back.
 - 2) Interior - Stainless steel liner and floor.
 - 3) Insulation - entire cabinet structure and solid doors are foamed-in-place using a high density, polyurethane insulation
 - 4) Welded, heavy duty steel frame rail, black powder coated for corrosion protection.
 - b. Door:
 - 1) Stainless steel exterior and liners.
 - 2) Each door fitted with 12" (305 mm) long recessed handle.
 - 3) Removeable, magnetic door gaskets of one piece construction.
- B. Freezer: Two freezer compartment(s) with door(s) and complying with AHAM HRF-1.
1. Basis of Desing Product: T series, Model number T-49F-HC as manufactured by True Manufacturing Co., Inc., web: www.truemfg.com
 - a. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers:
 - 1) LG
 - 2) Bosch
 - 3) Substitution: As per Division 01.
 2. Type: Freestanding.
 3. Dimensions: As indicated on Drawings.
 4. Storage Capacity:
 - a. Volume: As per manufacturer's standard volume.
 - b. Shelf Area: Six adjustable, heavy duty PVC coated wire shelves, 24 9/16" by 22 3/8".
 5. Features:
 - a. Interior light in compartment.
 - b. Temperature display
 - c. Lock with key.

- d. Cabinet Construction:
 - 1) Exterior - Stainless steel front. Anodized quality aluminum ends. Corrosion resistant GalFan coated steel back.
 - 2) Interior - attractive, clear coated aluminum liner. Stainless steel floor with coved corners.
 - 3) Insulation - entire cabinet structure and solid door are foamed-in-place using a high density, polyurethane insulation.
 - 4) Welded, heavy duty steel frame rail, black powder coated for corrosion protection.
- e. Doors:
 - 1) Stainless steel exterior with clear aluminum liner to match cabinet interior.
 - 2) Each door fitted with 12" (305 mm) long formed-in place recessed handle.
 - 3) Removeable, magnetic door gaskets of one piece construction.
- 6. Energy Star: Provide appliances that qualify for the EPA/DOE Energy Star product-labeling program.
- 7. Appliance Color/Finish: Stainless steel.

2.5 CLEANING APPLIANCES

A. Dishwasher: Complying with AHAM DW-1.

- 1. Basis of Design Product: Model number 383HT undercounter high temperature overflow type dishwashing machine with built in booster heater, as manufactured by Moyer Diebel, web: www.moyerdiebel.com.
 - a. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers:
 - 1) LG
 - 2) Bosch
 - 3) Whirlpool
 - 4) Substitution: As per Division 01.
- 2. Type: Built-in undercounter.
- 3. Dimensions: As indicated on Drawings.
- 4. Capacity:
 - a. Water Consumption for Full Load: 20.1 US gal.
- 5. Sound Level: Maximum 42 dB.
- 6. Tub and Door Liner: Manufacturer's standard with sealed detergent and automatic rinsing-aid dispensers.
- 7. Controls: Touch-pad controls with four wash cycles and hot-air and heat-off drying cycle options.
- 8. Features:
 - a. Self-cleaning food-filter system.
 - b. Hot-water booster heater for 140 deg F (60 deg C) wash water with incoming water at 100 deg F (38 deg C).
 - c. Lock-out feature.
 - d. Digital display panel.

9. Energy Star: Provide appliances that qualify for the EPA/DOE Energy Star product-labeling program.
 10. Front Panel: Manufacturer's standard.
 11. Appliance Color/Finish: Stainless steel.
- B. Clothes Washer : Complying with AHAM HLW-1.
1. Basis of Design Product: Quantum gold pro Front load washer as manufactured by Speed queen, web: www.speedqueencommercial.com.
 - a. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers:
 - 1) LG
 - 2) Bosch
 - 3) Whirlpool
 - 4) Substitution: As per Division 01.
 2. Type: Freestanding, front-loading unit.
 3. Dimensions: As indicated in Drawings.
 4. Drum: Perforated stainless steel.
 - a. Capacity: 21.5 lb (9.5 kg)
 5. Controls: Touch-pad controls for water-fill levels, wash/rinse water temperatures, and variable-speed and fabric selectors.
 - a. Wash Cycles: Three wash cycles, including regular, delicate, and permanent press.
 - b. Wash Temperatures: Three settings.
 6. Electrical Power: 120 V, 60 Hz, 1 phase, 15 A.
 7. Motor: Manufacturer's standard with built-in overload protector.
 8. Features:
 - a. Self-cleaning lint filter.
 - b. Unbalanced-load compensator.
 - c. Inlet Hoses: Minimum length 60 inches (1525 mm).
 - d. Drain Hoses: Minimum length 48 inches (1220 mm).
 - e. Self-leveling legs.
 - f. Automatic dispenser for bleach fabric softener and detergent.
 - g. End-of-cycle signal.
 - h. Electronic temperature control.
 - i. Water levels automatically set.
 - j. Card reader, mobile pay and single coin drop payment options.
 9. Energy Star: Provide appliances that qualify for the EPA/DOE Energy Star product-labeling program.
 10. Water-Efficient Clothes Washer: Provide clothes washer with modified energy factor greater than or equal to 2.0 and water factor less than 5.5.
 11. Appliance Finish: Manufacturers standard finish

a. Color: White.

C. Clothes Dryer : Complying with AHAM HLD-1.

1. Basis of Design Product: Quantum gold pro Front load dryer as manufactured by Speed queen, web: www.speedqueencommercial.com.
 - a. Other Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers:
 - 1) LG
 - 2) Bosch
 - 3) Whirlpool
 - 4) Substitution: As per Division 01.
2. Type: Freestanding, frontloading, electric unit.
3. Dimensions: As indicated in Drawings.
4. Drum: Manufacturer's standard.
 - a. Capacity: 18 lb (8.2 kg)
5. Controls: Touch-pad controls for drying cycle, temperatures, and fabric selectors.
6. Electric-Dryer Power: 208-24040 V, 60 Hz, 1 phase, 30 A.
7. Features:
 - a. Lint filter.
 - b. Electronic temperature and moisture-level-sensor controls.
 - c. End-of-cycle signal.
 - d. Integrated meter case
 - e. High efficiency exhaust blower with superior airflow 220 cfm (105 liters/sec).
 - f. Card reader, mobile pay and single coin drop payment options.
8. Appliance Finish: Manufacturer standard finish.
 - a. Color: White.

2.6 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.

- B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF RESIDENTIAL APPLIANCES

- A. Install appliances according to manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
 - 2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After installation, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

END OF SECTION 11 30 13

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SECTION 12 36 23.13 -

PLASTIC LAMINATE CLAD COUNTERTOPS

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. Plastic-laminate-clad countertops.
2. Accessories.

B. Related Requirements:

1. Section 01 8113 "Sustainable Design Requirements."
2. Section 05 50 00 "Metal Fabrication"
3. Section 06 10 53 "Miscellaneous Rough Carpentry"
4. Division 22 Plumbing for non-integral sinks and plumbing fittings.

1.3 REFERENCES

- A. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International Building Code, with California Amendments.
- B. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."
- C. Americans with Disabilities Act 2010 Standards.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Plastic-laminate-clad countertops.
2. Accessories.

B. Product Data Submittals: For each product.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

C. Shop Drawings:

1. Include plans, sections, details, and attachments to other work. Detail fabrication and installation, including field joints.
2. Show locations and sizes of cutouts and holes for items installed in plastic-laminate-clad countertops.
3. Apply AWI Quality Certification Program label to Shop Drawings.

- D. Samples: Plastic laminates in each type, color, pattern, and surface finish required in manufacturer's standard size.
- E. Samples for Initial Selection: For plastic laminates.
- F. Samples for Verification: As follows:
 - 1. Plastic Laminates: For each type, color, pattern, and surface finish required, 8 by 10 inches (200 by 250 mm) in size.
 - 2. Fabrication Sample: For each type and profile of countertop required, provide one sample applied to core material with specified edge material applied to one edge.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and fabricator.
- B. Product Certificates: For the following:
 - 1. Composite wood products.
 - 2. High-pressure decorative laminate.
 - 3. Chemical-resistant, high-pressure decorative laminate.
 - 4. Adhesives.
- C. Quality Standard Compliance Certificates: AWI Quality Certification Program.
- D. Qualification Statements: For Installer.
- E. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
 - 1. Shop Certification: AWI's Quality Certification Program accredited participant.
- B. Installer Qualifications: AWI's Quality Certification Program accredited participant.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.
- B. Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
- C. Keep surfaces of countertops covered with protective covering during handling and installation.

1.8 FIELD CONDITIONS

- A. Environmental Limitations with Humidity Control: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.
- B. Field Measurements: Where countertops are 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.

PART 2 PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD COUNTERTOPS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of plastic-laminate-clad countertops indicated for construction, finishes, installation, and other requirements.
 - 1. Provide inspections of fabrication and installation together with labels and certificates from AWI certification program indicating that countertops comply with requirements of grades specified.
 - 2. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.
- B. Grade: Premium.
- C. High-Pressure Decorative Laminate: ISO 4586-3, Grade HGS.
 - 1. Acceptable Manufacturers: Subject to compliance with requirements, provide approved product from one of the following manufacturers:
 - a. Wilsonart
 - b. Formica.
 - c. Panolam Industries International, Inc.
- D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. Match Architect's sample.
- E. Edge Treatment: Bullnose edge
- F. Core Material: MDF.
- G. Core Material at Sinks: MDF made with exterior glue.
- H. Core Thickness: 3/4 inch (19 mm) .
 - 1. Build up countertop thickness to 1-1/2 inches (38 mm) at front, back, and ends with additional layers of core material laminated to top.
- I. Backer Sheet: Provide plastic-laminate backer sheet, ISO 4586-3, grade to match exposed surface, on underside of countertop substrate.
- J. Paper Backing: Provide paper backing on underside of countertop substrate.

2.2 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
 - 1. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of countertop and quality grade specified unless otherwise indicated.
 - 1. Core Material: Industrial Grade Medium Density Fiberboard (MDF) manufactured with a formaldehyde-free adhesive system, ANSI A208.2, Grade 130.
 - a. Basis of Design: Medite II MDF as manufactured by Roseburg, Springfield, OR; tel: (800) 245-1115, web: www.roseburg.com .

- b. Substitutions: Per Section 01 2500.
2. Core Material at Sinks and Interior High Moisture Areas: Industrial Grade Medium Density Fiberboard (MDF) manufactured with a formaldehyde-free adhesive system.
 - a. Medex MDF as manufactured by Roseburg, Springfield, OR; tel: (800) 245-1115, web: www.roseburg.com .SCS certified for pre-consumer recycled wood fiber content.
 - b. Substitutions: Per Section 01 2500.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products in accordance with test method indicated by a qualified testing agency.
 1. Use treated materials that comply with requirements of referenced quality standard. Do not use materials that are warped, discolored, or otherwise defective.
 2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
 3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.
- B. Fire-Retardant-Treated Lumber and Plywood: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent, respectively.
 2. For items indicated to receive a stained or natural transparent finish, use organic resin chemical formulation.
 3. Mill lumber before treatment and implement procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of exposed treated woodwork.
- C. Fire-Retardant MDF: Medium-density fiberboard panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 200 or less in accordance with ASTM E84.

2.4 ACCESSORIES

- A. Wire-Management Grommets: Circular, molded-plastic grommets and matching plastic caps with slot for wire passage.
 1. Outside Diameter: 2 inches (51 mm).
 2. Color: Black,

2.5 MISCELLANEOUS MATERIALS

- A. Adhesive for Bonding Plastic Laminate: Type I, waterproof type as selected by fabricator to comply with requirements.
 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.6 FABRICATION

- A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- B. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch (25 mm) over base cabinets. Ease edges to radius indicated for the following:
 - 1. Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.
- C. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times countertop fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended, and check measurements of assemblies against field measurements before disassembling for shipment.
- D. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. 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.
 - 1. Seal edges of cutouts by saturating with varnish.

PART 3 EXECUTION

3.1 PREPARATION

- A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.
- B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing.

3.2 INSTALLATION

- A. Grade: Install countertops to comply with same grade as item to be installed.
- B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
 - 1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items. 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.
 - 2. Seal edges of cutouts by saturating with varnish.
- C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
 - 1. Secure field joints in countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten in accordance with manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

- D. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical-treatment manufacturer's written instructions, including those for adhesives used to install woodwork.
- F. Countertop Installation: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops level and true in line. Use concealed shims as required to maintain not more than a 1/8-inch-in-96-inches (3-mm-in-2400-mm) variation from a straight, level plane.
 - 2. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and to walls with adhesive.
 - 3. Seal joints between countertop and backsplash, if any, and joints where countertop and backsplash abut walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.3 FIELD QUALITY CONTROL

- A. Inspections: Provide inspection of installed Work through AWI's Quality Certification Program certifying that woodwork, including installation, complies with requirements of the referenced standard for the specified grade.
 - 1. Inspection entity is to prepare and submit report of inspection.

3.4 ADJUSTING AND CLEANING

- A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace countertops. Adjust joinery for uniform appearance.
- B. Clean countertops on exposed and semiexposed surfaces.
- C. Protection: Provide Kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of 48 inches (1220 mm) o.c. Remove protection at Substantial Completion.

END OF SECTION 12 36 23.13