SAN ANTONIO WATER COMPANY
UPLAND, CALIFORNIA

CONTRACT DOCUMENTS

NEW OFFICE AND OPERATIONS YARD FACILITIES

UPLAND, CA

CO#1507

BID DATE

November 5, 2026, at 3:00 p.m.

SECTION 1.1
Of
PROCEDURAL DOCUMENTS

NOTICE INVITING BIDS

NOTICE IS HEREBY GIVEN that San Antonio Water Company, hereinafter referred to as the "Company", on behalf of and as authorized by the Board of Directors of Company, will receive sealed bids for:

***NEW OFFICE AND OPERATIONS YARD FACILITIES**, Upland CA [CO#1507]*

Bids will be received in the office of San Antonio Water Company up to the hour of **3:00 o'clock p.m. on November 5, 2026** and then publicly opened and read aloud. Said bids will thereafter be referred to the Board of Directors for consideration.

Bids should be marked on the outside of the sealed envelope:

RE: Contract Documents and Specifications for New Office and Operations Yard Facilities, *Upland, CA [CO#1507]*

Mailed or dropped off sealed bids may be delivered to:

San Antonio Water Company
139 North Euclid Avenue
Upland, California 91786

Owner reserves the right to reject any and all proposals, to waive any irregularity or to award the contract to other than the lowest responsible bidder. Bidder may not withdraw his/her bid for 30 days after the bid opening.

CONTRACT DOCUMENTS
Copies of the Contract documents may be examined and obtained at the office of San Antonio Water Company, 139 North Euclid Avenue, Upland, California 91786. Full Size plans and specification contract documents may be obtained by downloading at no charge (www.sawaterco.com).

PRE-BID MEETING
A pre-bid meeting / job walk for prospective bidders will be conducted on **October 14th at 2:00 p.m.** at the job site on 20th Street.

PLANS AND SPECIFICATIONS
All of the above work is to be done under Contract with the Company and in accordance with those certain plans specifications and drawings prepared by San Antonio Water Company, hereafter called the "Architect" or "Engineer", and considered and approved by the Board of Directors of Company to which Documents reference is hereby made for a description of said works and improvements.

BONDS

The Contractor will be required to execute a Contract on the Company's standard form; furnish Contract Performance Bond (100% of contract amount) and Payment (Materials) Bond (50% of contract amount) with a corporate surety in conformance with the Contract Documents, or equivalent substitution in lieu of bonds, each for not less than the aforementioned amount of the total bid price; furnish certificates of insurance evidencing that all insurance coverage required by the Contract Documents has been secured.

PAYMENT

Company payments will be made by check to the Contractor in accordance with the provisions of the specifications and on itemized estimates duly certified and approved by the General Manager of the Company and Architect submitted in accordance therewith, based on labor and materials incorporated into said works and improvements during the preceding month by the Contractor, less 10% withholding.

Payment shall not be made more often than once each thirty-(30) days. Final payment shall be made no earlier than thirty-five (35) days subsequent to filing of Notice of Completion.

Contractor is advised that he/she may, at his/her sole cost and expense, substitute securities equivalent to any monies withheld by the Company to insure performance under the Contract. Such securities shall be deposited with a State or Federally Chartered Bank, located in Upland and as approved by the Company, as escrow agent who shall pay such monies to the Contractor upon satisfactory completion of the Contract. The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon. Securities eligible for investment under this section shall include those listed in Government Code Section 16430 or bank or savings and loan certificates of deposit.

BID SECURITY

All proposals or bids shall be accompanied by a cashier's or certified check payable to the order of Company, amounting to ten (10) percent of the bid or by a bond in said amount and payable to Company, signed by the Bidder and a corporate surety. Said check shall be forfeited or said bond shall become payable to Company in case the Bidder depositing the same does not, within ten (10) days after written notice, sign the Contract.

AWARD AND EXECUTION

The Award of Contract, if made, will be within thirty (30) calendar days from the date of the bid opening.

Bidders shall agree that the Bid shall be good and may not be withdrawn for a period of thirty (30) calendar days after the scheduled closing time for receiving Bids.

The Contractor shall execute the Contract within ten (10) working days after he has been notified in writing of the award.

The Company hereby reserves the right to reject any and all proposals, to waive any irregularity, and to award the Contract to the lowest responsive and responsible Bidder.

CONTRACTOR'S LICENSE CLASSIFICATION

The prime Contractor must possess the following California Contractor's License:

> B – General Engineering Contractors license at the time of the scheduled bid opening of this Contract.

DATED: October 8, 2026

SAN ANTONIO WATER COMPANY

Brian C. Lee

Brian Lee, General Manager

INSTRUCTIONS TO BIDDERS

Bids will be received by the San Antonio Water Company hereinafter called the **"Company"**, at 139 North Euclid Avenue, Upland, California 91786, until **3:00 p.m., November 5, 2026**

Each Bid proposal must be submitted along with supporting Documents and bid proposals guarantee, all signed in a sealed envelope, and addressed to the Company at the above referenced address. Each sealed envelope containing a Bid must be plainly marked on the outside as:

Contract Documents and Specifications
for
New Office and Operations Yard Facilities*, Upland, CA*
Project CO-#1507

and the envelope should bear on the outside the name of the Bidder, his address and his license number. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope, labeled as shown in the advertisement for Bid, and addressed to:

San Antonio Water Company
139 North Euclid Avenue
Upland, California 91786

Bidders are advised that in selecting a Contractor, Company reserves the right to consider the financial responsibility and general competency of each Bidder, as well as his/her reputation within the industry. Company expects each Bidder to fully and truthfully disclose all information required of the Bidder by the Bidding Documents. Each Bidder must be properly licensed and must sign and submit with his/her Proposal, Bidding Schedule / Declaration, the Bidder's Statement of Experience and References, Financial Statement (if requested), Plan for Construction, Bidding sheets, list of manufacturers, License Number Statement and other Supporting Documents. All Bidders shall supply the names and addresses of major material Suppliers and subcontractors as set forth in the bid.

All bid proposals shall be opened and read at the time and place set forth in the Notice Inviting Bids herein. Bidders and/or their authorized representatives are invited to be present. The award, if made, will be made within ten (10) days of the opening. The Company's policy is to award to the lowest responsible Bidder who can comply with the projected delivery and/or completion schedules. The Company may make such investigations as he deems necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Company all such information and data for this purpose as the Company may request. The Company reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Company that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the work contemplated therein. The Company reserves the right to reject any and all bids, to waive any irregularity, minor defects, or to award the subject Contract to other than the lowest Bidder. Notice of Award shall be made to a successful Bidder in writing and mailed to the address as set forth on the signature page of the Bidding Documents.

All Bids must be made on the required Bid forms. All blank spaces for Bid prices must be filled in, in ink or typewritten, and the Bid form must be fully completed and executed when submitted. Only one copy of the Bid form is required.

In the event there is more than one bid item in a Bidding Schedule, the Bidder shall furnish a price for all bid items in the schedule, and failure to do so will render the Proposal informal and may cause its rejection. The Bidder shall state in figures, the unit pieces or the specific sums as the case may be, for which he proposes to supply the labor, materials, supplies or machinery, and completely perform the Contract. The total amount of each item bid, and the total amount of the bid shall be stated in words and figures.

If the unit price and total amount named by a Bidder for any items are not in agreement, the unit price alone will be considered, as representing the Bidders intention and the total will be corrected to conform thereto. Quantities set forth in the bidding sheet are estimates of the amount of materials and equipment to be furnished and the amount of work to be done and are given only as a basis for comparison of bids. Final payment shall be made for the actual final quantities of the items at the unit prices bid in the proposal.

Each Bidder shall complete the attached Bid Proposal and Supporting Documents including any addenda or bulletins issued before receipt of bids and public opening of same. Each blank of each page shall be completed in full. The completed forms shall be without interlineations, alterations, or erasures; however, Bidder may correct errors by striking or lining out mistakes, entering corrections immediately there above and initialing the strikeout.

Company may, at its discretion, reject any bid to which the Bidder has added conditions, limitations, provisions, or any interlineations or alterations. Unauthorized conditions, limitations, or provisions attached to the Proposal will render it non-responsive and may cause its rejection. The completed Proposal forms shall be without interlineation, alterations, or erasures. Alternative proposals will not be considered unless specifically requested. **Oral, telephonic proposals or modifications will not be considered.** A person, firm, or corporation shall not be allowed to make or file, or to be interested in, more than one bid, except an alternative bid when specifically requested; provided however, a person, firm, or corporation who has submitted a sub-proposal to a Bidder submitting a Proposal, or who has quoted prices on material to such Bidders, is not thereby disqualified from submitting a sub-proposal or firm quoting prices to other Bidders submitting proposals, or from submitting a Proposal as a prime Contractor. Company may also, at its discretion, reject any bid for which the Bidder has failed to supply all requested information or has misrepresented any of same information. Company will not consider alternative proposals unless they are called for by these instructions or the supplemental proposals on forms other than those bound herein, and those forms shall not be removed from the bound volume.

Separate copies of Bidder's Proposal with Supporting Documents are available for Bidder's use. Bidder shall retain said copies for his/her record. They shall not be submitted as a proposal.

Company will not consider any proposal which is not complete.

Should a Bidder find discrepancies in, or omissions from the Special Provisions, General Provisions, Drawings, or other Documents bound herein, or should he/she be in doubt as to their meaning, he/she should immediately notify the Company who may send a written clarification to all Bidders.

If the Bid Proposal is made by an individual, it shall be signed and his/her full name and address shall be given; if it is made by a co-partnership, it shall be signed with the co-partnership name by one of the partners, who shall sign his/her own name and, in addition, the name and address of each partner shall be given; if it is made by a corporation, the name of the corporation shall be signed by its duly authorized officer, or officers, attested by the corporation seal, and the names and titles of all current officers of the corporation shall be given.

Any bid may be withdrawn prior to the above scheduled time for the opening of Bids or authorized postponement thereof. The Bidder by means of a written request, signed by the Bidder or their properly authorized representative may withdraw the Proposal. Such written request must be delivered to the place stipulated in the Notice Inviting Bids for receipt of proposals prior to the scheduled closing time for receipt of proposals. No Proposal may be withdrawn after the hour fixed for opening bids without making the accompanying certified or cashier's check, or Bidder's bond, subject to forfeiture as liquidated damages in like manner as in the case of failure to execute the Contract of furnish required bonds as hereinafter provided. Any bid received after the time and date specified shall not be considered. No Bidder may withdraw a Bid within sixty (10) days after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Company and the Bidder.

Bidders must satisfy themselves of the character of the work to be performed by examination of the site and review of the Drawings and Specifications, including Addenda. Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to his Bid. After bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the nature of the work to be done.

The Company shall provide to Bidders, prior to Bidding, all information which is pertinent to, and delineates and describes, the land owned, and rights-of-way acquired or to be acquired.

The Contract Documents contain the provisions required for the construction of the Project. Information obtained from an officer, agent, or employee of the Company or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the Contract.

Each Bid must be accompanied by a Bid Bond (on the required form) payable to the Company for ten (10) percent of the total amount of the bid. Each bid proposal shall be accompanied by a certified or cashier's check or bid bond (bid bond shall be submitted on the form attached herein), or equivalent substitution of sureties for an amount of not less than 10 percent of the total bid amount named in the Bidding Sheet. Said check, bond or substitute shall be made payable to the Company and shall be given as a guarantee that the Bidder will enter into the Contract described in the Notice Inviting Bids herein if awarded the work. By submitting a proposal, each Bidder agrees that the Company may retain the bid proposal guarantee as liquidated damages if the Bidder is awarded the work but fails to or refuses to timely enter the Contract except as may otherwise be required by California Government Code Sections 37933-37935. As soon as the Bid prices have been compared, the Company will return the Bonds of all except the three lowest responsive and responsible Bidders. When the Agreement is executed, the bonds of the two remaining unsuccessful Bidders will be retained until all Contract Documents have been executed and approved, after which it will be returned.

Bonds and Insurance Certificates must be in the form required by the Company (substitutions are not permitted) and the Company must be authorized to do business in the State of California. Surety Companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in Section 105 of the California Insurance Code. Surety Companies executing bond must also appear on the "Treasury List" of companies holding a Certificate of Authority as acceptable surety on Federal Bonds and posses an underwriting authority limitation exceeding the contract amount.

The successful Bidder shall, upon receipt of Notice of Acceptance of his/her bid, promptly secure with a responsible corporate surety or sureties approved by the Company, a Payment Bond and a Contract Performance Bond (on the required form), each in the amount of one hundred (100) percent of the Contract Price, will be required for the faithful performance of the Contract. Contractor may, upon written request, and at his sole expense after approval by the Board of Directors, deposit substitute securities referenced in Government Code Section 16430, or bank or savings and loan certificates of deposit, as authorized by Public Contract Code Section 22300 in lieu of retention monies withheld to ensure performance.

Attorneys-in-fact who sign Bid Bonds or Labor and Material Payment Bonds and Contract Performance Bonds must file with each Bond a certified and effective dated copy of the Power of Attorney.

The party to whom the Contract is to be awarded will be required to execute the Agreement and submit the Payment Bond, Contract Performance Bond and Insurance Certificates on the required forms within ten (10) calendar days from the date when the necessary Contract Agreement, Bonds, and Insurance Certificate forms and Notice of Award are delivered to lowest responsive Bidder. A corporation to which an award is made will be required, before the Contract is finally executed, to furnish evidence of its corporate existence and of the authority of the officer signing the Contract and bond for the corporation to so sign. In case of failure of the Bidder to execute the Agreement, the Company may, at its option, consider the Bidder in default; in which case the Bid bond accompanying the proposal shall become the property of the Company.

The Company, within ten (10) days of receipt of acceptable Labor and Material Payment bond, Contract Performance Bond, Insurance Certificate & Special Endorsement, and Agreement signed by the party to whom the Agreement was awarded, shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Company not execute the Agreement within such period, the Bidder may, by Written Notice, withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Company.

A Notice to Proceed will be issued by the Company as a part of this Contract within ten (10) days of the execution of the agreement by the Company. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Company and Contractor. If the Notice to Proceed has not been issued within the above-specified period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

The Company may make such investigations as he deems necessary to determine the ability of the Bidder to perform the Work, and the Bidder shall furnish to the Company all such information and data for this purpose as the Company may request. The Company reserves the

right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Company that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the Work contemplated therein.

The Company reserves the right to reject all bids.

Award, if made, will be made to the lowest responsive and responsible Bidder, as determined by the Company.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout. The Bidder's attention is directed to the Standard Specifications for Public Works construction and modifications of the Special Provisions bound herein for additional requirements of the Proposal and Contract Documents.

Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to his Bid.

All work shall be completed within **Three Hundred and Sixty Five (365) calendar days** from Notice to Proceed.

ADDITIONAL INSTRUCTIONS TO BIDDERS

DEFINED TERMS. Terms used in these Instructions to Bidders and the Notice Inviting Bids which are defined in the General Conditions have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to OWNER, as distinct from a sub-bidder, who submits a price or quote to a Bidder

LOCAL BUSINESS LICENSE. ALL CONTRACTORS, including Subcontractors not already having a local business license for the work contemplated, will be required to secure the appropriate license before a Contract can be executed.

3. INTERPRETATIONS AND ADDENDA.

A. All questions about the meaning or intent of the Contract Documents are to be directed to the PROJECT ARCHITECT in writing. Additions, deletions, or revisions to the Contract Documents considered necessary by the PROJECT ARCHITECT in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by the PROJECT ARCHITECT or OWNER as having received the Contract Documents. Questions received less than 10 days prior to the date of Bids may not be answered. Only answers to such questions issued by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

B. Addenda may also be issued to make other additions, deletions, or revisions to the Contract Documents.

C. Bidders shall make no special interpretation or inference of intent from differing formats in the Technical Specifications.

4. BIDDER'S EXAMINATION OF CONTRACT DOCUMENTS AND SITE.

A. It is the responsibility of each Bidder before submitting a Bid:

1. To examine thoroughly the Contract Documents and other related data identified in the Bidding Documents (including "technical" data referred to below);

2. To visit the site to become familiar with local conditions that may affect cost, progress, or performance, of the WORK.

3. To consider federal, state, and local Laws and Regulations that may affect cost, progress or performance, of the WORK.

4. To study and carefully correlate the Bidder's observations with the Contract Documents; and

5. To notify the PROJECT ARCHITECT of all conflicts, errors, ambiguities, or discrepancies in or between the Contract Documents and such other related data.

B. Reference is made to the Supplementary General Conditions for identification of:

1. Those reports of explorations and tests of subsurface conditions at the site which have been utilized by the PROJECT ARCHITECT in the preparation of the Contract Documents.

Those drawings or videotapes of physical conditions in or relating to existing surface and subsurface conditions (except Underground Utilize) which are at or continuous to the site have been utilized by the PROJECT ARCHITECT in the preparation of the Contract Documents.

The PROJECT ARCHITECT makes no representation as to the completeness of the reports or drawings referred to in Paragraphs 4.B.1 and 4.B.2 or the accuracy of any data or information contained therein. The Bidder may rely upon the accuracy of the technical data contained in such reports and drawings. However, the Bidder may not rely upon any interpretations of such technical data, including any interpretation or extrapolation thereof, or any non-technical data, interpretations and opinions contained therein.

C. Copies of reports and drawings referred to in Paragraph 4.B will be made available by the OWNER to any Bidder upon request, if said reports and drawings are not bound herein. Those reports and drawings are not part of the Contract Documents.

D. Information and data reflected in the Contract Documents with respect to Underground Utilities at or contiguous to the site are based upon information and data furnished to the OWNER and PROJECT ARCHITECT by the owners of such Underground Utilities or others, and the OWNER does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary General Conditions or Section 01530 – Protection of Existing Facilities.

E. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, Underground Utilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 5.1 and 5.3 of the General Conditions.

F. Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface, and Underground and Utilities) at or contiguous to the site or otherwise which may affect cost, progress or performance of the WORK and which the Bidder deems necessary to determine its Bid for performing the WORK in accordance with the time, price and other terms and conditions of the Contract Documents.

G. On request a minimum of 2 days in advance, the OWNER will provide each Bidder access to the site to conduct such examinations, investigations, explorations, tests, and studies as each Bidder deems necessary for submission of a Bid. Location of any excavation or boring shall be subject to prior approval of OWNER and applicable agencies. Bidder shall fill all holes, restore all pavement to match existing structural section, and shall clean up and restore the site to its former condition upon completion of such explorations. OWNER reserves the right to require Bidder to execute an Access Agreement with the OWNER prior to accessing the site.

H. The lands upon which the WORK is to be performed, rights-of-way, and easements for access thereto and other lands designated for use by the CONTRACTOR in performing the WORK area identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by the CONTRACTOR. Easements for permanent structures or permanent changes in

existing structures are to be obtained and paid for by the OWNER unless otherwise provided in the Contract Documents.

The submission of a Bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of this Section 4 and the following:

1. That the Bid is premised upon performing the WORK required by the Contract Documents without exception and such means, methods, techniques, sequences, or procedures of construction (if any) as may be required by the Contract Documents.

2. That Bidder has given the PROJECT ARCHITECT written notice of all conflicts, errors, ambiguities, and discrepancies in the Contract Documents and the written resolution thereof by the PROJECT ARCHITECT is acceptable to the Bidder; and

3. That the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the WORK.

5. BID FORMS. The Bid shall be submitted on the Bid Forms bound herein. All blanks on the Bid Forms shall be completed in ink. All names must be printed below the signatures. The Bid shall be submitted in a sealed envelope which shall be plainly marked in the upper left hand corner with the name and address of the Bidder and shall bear the worlds 'BID FOR" followed by the title of the Contract Documents for the WORK, the name of the OWNER, the address where Bids are to be delivered or mailed, and the date and hour of opening of Bids.

6. CERTIFICATES.

A. Bids by corporations must be executed in the corporate name by the president, a vice-president, or other corporate officer. Such Bid shall be accompanied by the enclosed Certificate of Authority to sign, attested by the secretary or assistant secretary, and with the corporate seal. The corporate ad dress and state of incorporation must appear below the signature.

B. Bids by partnerships must be executed in the partnership name and be signed by a managing partner, accompanied by the enclosed Certificate of Authority to sign, and his/her title must appear under the signature and the official address of the partnership must appear below the signature.

C. Bids by joint ventures must be executed in the joint venture name and be signed by a joint venture managing partner, accompanied by the enclosed Certificate of Authority to sign, and his/her title must appear under the signature and the official address of the joint venture must appear below the signature.

7. DISQUALIFICATION OF BIDDERS. More than one Bid from an individual, firm, partnership, corporation, or association under the same or different names will not be considered. If the OWNER believes that any Bidder is interested in more than one Bid for the WORK contemplated, all Bids in which such Bidder is interested will be rejected. If the OWNER believes that collusion exists among the Bidders, all Bids will be rejected. A party who has quoted prices to a Bidder is not hereby disqualified from quoting prices to other Bidders, or from submitting a Bid directly for the WORK.

8. QUANTITIES OF WORK. The quantities of work or material stated in unit price items of the Bid are supplied only to give an indication of the general scope of the WORK; the OWNER

does not expressly or by implication agree that the actual amount of work or material will correspond therewith and reserves the right after award to increase or decrease the quantity of any unit price item of the WORK by an amount up to and including 25 percent of any Bid item, without a change in the unit price, and shall include the right to delete any Bid item in its entirely or to add additional Bid items up to and including an aggregate total amount not to exceed 25 percent of the Bid price.

SUBSTITUTE OR "OR EQUAL" ITEMS. Whenever materials or equipment re specified or described in the Contract Documents by using the name of a particular Supplier and the name is followed by the word "or equal," the Bidder may write the name of a substitute Supplier (which the Bidder considers as an "or equal") in the Proposed Substitute Equipment/Material Supplier List in the Bid Forms. These substitute Suppliers will only be considered after award of the Contract. The bidder shall have 35 days after the award of the contract for submission of data substantiating a request for a substitution, as set forth in the Public Contract Code, Section 3400. The procedure for the submittal of substitute or "or equal" products is specified in Section 01600 – Products, Materials, Equipment, and Substitutions. The Bidder shall not be relieved of any obligations of the Contract Documents or be entitled to an adjustment in the Contract Price in the event any proposed substitute supplier is not subsequently approved.

10. COMPETENCY OF BIDDERS. In selecting the lowest responsive, responsible Bidder, consideration will be given not only to the financial standing but also to the general competency of the Bidder for the performance of the WORK covered by the Bid. To this end, each Bid shall be supported by a statement of the Bidder's experience as of recent date on the form entitled "INFORMATION REQUIRED OF BIDDER" bound herein.

11. SUBMISSION OF BIDS. The Bid shall be delivered by the time and to the place stipulated in the Notice Inviting Bids. It is the Bidder's sole responsibility to see that its Bid is received in proper time and at the proper place.

12. BID SECURITY, BONDS, AND INSURANCE. Each Bid shall be accompanied by cash, a certified or cashier's check or approved Bid Bond in the amount stated in the Notice Inviting Bids. Said check or bond shall be made payable to the OWNER and shall be given as a guarantee that the Bidder, if awarded the WORK, will enter into an Agreement with the OWNER, and will furnish the necessary insurance certificates, Payment Bond, and Performance Bond; each of said bonds to be in the amount stated in the Supplementary General Conditions. In case of refusal or failure to enter into said Agreement, the check or Bid Bond, as the case may be, shall be forfeited to the OWNER. If the Bidder elects to furnish a Bid Bond as its Bid security, The Bidder shall use the Bid Bond form bound herein, or one conforming substantially to it in form. Bid Bonds shall comply with the requirements applicable to payment and performance bonds in the General Conditions.

13. DISCREPANCIES IN BIDS. In the event there is more than one Bid item in a Bid Schedule, the Bidder shall furnish a price for all Bid items in the Schedule, and failure to do so will render the Bid non-responsive and shall cause its rejection. In the event there are unit price Bid items in a Bidding schedule and the amount indicated for the unit price Bid item does not equal the product of the unit price and quantity, the unit price shall govern, and the amount will be corrected accordingly, and the BIDDER shall be bound by said correction. In the event there is more than one Bid item in a Bid Schedule and the total indicated for the Schedule does not agree with the sum of the prices Bid on the individual items, the prices Bid on the individual items shall govern and the total for the Schedule will be corrected accordingly, and the BIDDER shall be bound by said corrections.

14. MODIFICATIONS AND UNAUTHORIZED ALTERNATIVE BIDS. Unauthorized conditions, limitations or provisos attached to the Bid shall render it informal and may cause its rejection as being non-responsive. The Bid forms shall be completed without interlineations, alterations, or erasures in the printed text. Alternative Bids will not be considered unless called for. Oral, telegraphic, or telephonic Bids or modifications will not be considered.

15. WITHDRAWAL OF BID. The Bid may be withdrawn by the Bidder by means of a written request, signed by the Bidder or its properly authorized representative. Such written request must be delivered to the place stipulated in the Notice Inviting Bids for receipt of Bids prior to the scheduled closing time for receipt of Bids.

16. AWARD OF CONTRACT. Award of the contract, if awarded, will be made to the lowest responsive, responsible Bidder whose Bid complies with the requirements of the Contract Documents. Unless otherwise specified, any such award will be made within the period stated in the Notice Inviting Bids that the bids are to remain open. Unless otherwise indicated, a single award will be made for all the Bid items in an individual Bid Schedule. In the event the WORK is contained in more than one Bid Schedule, the OWNER may award Schedules individually or in combination. In the case of two Bid Schedules which are alternative to each other, only one of such alternative schedules will be awarded.

17. RETURN OF BID SECURITY. Within 14 days after award of the contract, the OWNER will, if requested, return the Bid securities accompanying such Bids that are not being considered in making the award. All other Bid securities will be held until the Agreement has been finally executed. They will then be returned, if requested, to the respective Bidders whose Bids they accompany, within 60 days of the award.

18. EXECUTION OF AGREEMENT. The Bidder to whom award is made shall execute a written Agreement with the OWNER on the form of agreement provided, shall secure all insurance, and shall furnish all certificates and bonds required by the Contract Documents within 10 calendar days after receipt of the agreement forms from the OWNER. Failure or refusal to enter into an Agreement as herein provided or to conform to any of the stipulated requirements in connection therewith shall be just cause for annulment of the award and forfeiture of the Bid security. If the lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the OWNER may award the Contract to the second lowest responsive, responsible Bidder. If the second lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the OWNER may award the contract to the third lowest responsive, responsible Bidder. On the failure or refusal of such second or third lowest Bidder to execute the Agreement, each such Bidder's Bid securities shall be likewise forfeited to the OWNER.

19. LIQUIDATED DAMAGES. The fixed liquidated damages amount is hereby established as Eight Hundred Dollars ($500.00) for each calendar day of unauthorized delay in completion of the Work beyond 365 calendar days as set forth in the Notice Inviting Bids. This figure was calculated based upon a reasonable estimation of prospective damages for this particular project.

20. WORKERS' COMPENSATION REQUIREMENT. The Bidder should be aware that in accordance with Section 3700 of the California Labor Code it will, if awarded the Contract, be required to secure the payment of compensation to its employees and execute the Workers' Compensation Certification in the form contained in these Contract Documents.

21. DESIGNATION OF SUBCONTRACTORS. Pursuant to state law, each bidder must designate the name and location of each subcontractor who will perform work or render services for the prime Bidder in an amount that exceeds one-half of one percent (0.5%) of the Bidder's Total Bid Price, as well as the portion of work each such subcontractor will perform. Bidders must make these designations on the document titled "List of Subcontractors' which has bee included with the Bid Forms (Document 00300).

22. FILING OF BID PROTESTS. Bidders may file a "protest" of a contract award with the Owner. In order for a Bidder's protest to be considered valid, the protest must:

- Be filed timely and in writing within five (5) Calendar Days after the bid opening date.
- Clearly identify the specific accusation involved.
- Clearly identify the specific Owner Staff/Board recommendation being protested.
- Specify, in detail, the grounds of the protest and the facts supporting the protest.
- Include all relevant, supporting documentation with the protest at time of filing.

If the protest does not comply with each and every one of these requirements, it will be rejected as invalid. If the protest is valid the Owner shall review the basis of the protest and all relevant information. The Owner will deny or concur with the protest and provide a written decision to the protestor. The protestor may then appeal the decision to the Owners' Board of Directors.

23. OWNER'S RIGHTS. The owner may investigate the qualifications of any Bidder under consideration, require confirmation of information furnished by the Bidder, and require additional evidence of qualifications to perform the work described in these Bid Documents. The Owner reserves the right to:

- Reject any or all of the Bids if such action is in the best interest of the Owner.
- Issue subsequent Notices Inviting Bids.
- Cancel this entire Notice Inviting Bids.
- Appoint evaluation committees to review any or all Bids.
- Seek the assistance of outside technical experts to validate the Bid(s).
- Approve or disapprove the use of particular subcontractors.
- Waive informalities and irregularities in Bids.

The Notice Inviting Bids does not commit the Owner to enter into a contract, nor does it obligate the Owner to pay any costs incurred in preparation and submission of Bids or in anticipation of a contract.

24. BIDDER'S RESPONSIVENESS. The Owner will evaluate Bids for responsiveness at the time of Bid opening and before award is made. A Bid must be in strict compliance with the commercial and technical specifications, without exception. Only Bids which conform in all material respects to the Bid Documents can be eligible for award. A Bid not meeting the requirements of the responsiveness checklist may be rejected immediately upon opening and returned to the Bidder's representative.

25. RESPONSIBILITY CRITERIA. Responsibility is the apparent ability of the bidder to meet and complete successfully the requirements of the Contract. The Owner reserves the right to consider the financial responsibility and general competency of each Bidder, as well as its reputation within the industry. Owner may request, and apparent low bidder shall provide, a financial statement, audited if necessary, including the Bidder's latest balance sheet and income statement. Owner expects that each Bidder will fully and truthfully disclose all information required of the Bidder by the Bid Documents. The prospective contractor, in order to be evaluated by the Owner as being a responsible contract, must complete the Bid Form to determine that it:

- Has or can secure adequate financial resources to perform the contract.

- Is able to meet the performance or delivery schedule of the contract, taking into consideration other business commitments; and

- Has a satisfactory record of performance. A contractor seriously deficient in current contract performance, considering the number of contracts and extent of the deficiencies, is presumed not to meet this requirement unless the deficiencies are beyond its control or there is evidence to establish its responsibility notwithstanding the deficiencies. Evidence of such satisfactory performance record should show that the contractor: (1) has a satisfactory record of integrity in its dealings with government agencies and with applicable laws and regulations; (2) has the necessary organization, experience, satisfactory safety record, accounting and operational controls and technical skills or the ability to obtain them; and (3) has the necessary production, construction and technical equipment and facilities or the ability to obtain them.

– END OF INSTRUCTIONS TO BIDDERS –

CONTRACTOR'S PROPOSAL

BID PROPOSAL WITH SUPPORTING DOCUMENTS FOR

NEW OFFICE AND OPERATIONS YARD FACILITIES, Upland, CA

CO#1507

FROM:

NAME OF BIDDER: _____

BUSINESS ADDRESS: _____

TELEPHONE NO: _____

TO:

BOARD OF DIRECTORS
SAN ANTONIO WATER COMPANY

BOARD:
Pursuant to your invitation to provide Sealed Bids for the "NEW OFFICE AND OPERATIONS YARD FACILITIES*, Upland, CA* ***[CO#1507]*** ", the undersigned hereby declares that the only persons interested in this Proposal as principals are those named herein, that the Bidder has no connection with any other parties bidding on this project (except for a corporate division of the undersigned which may submit an independent bid), and that this bid has been prepared and submitted independently, without consultation, communication, or agreement with any other Bidder or competitor, without any collusion, fraud, misrepresentation, or deceit.

In submitting this Proposal, the undersigned further declares that he/she has read the Notice Inviting Bids, the Instruction to Bidders, the unexecuted Contract, and all other Documents incorporated by reference, including the Special Provisions, the Basic Specifications, Modifications thereto, and the Construction Plans and Standard Drawings and that he/she has inspected the work site and hereby proposes to furnish all materials, machinery, tools, labor and services, and do all the work necessary to complete the Project in accordance with said plans, specifications and provisions at the below stated item prices.

Bidder shall provide a SCHEDULE OF VALUES with a specific breakdown of tasks and costs

Bidder shall also provide a PROJECT SCHEDULE to establish the project timeline.

In exchange for consideration of this Proposal by the Company, the Bidder agrees that if his/her bid is accepted by the Company, the Bidder will execute said Contract, furnish and provide the items set forth in this Proposal and required by the Contract, the Standard Specifications for Public Works Construction, the Special Provisions and Specifications, and the Construction Plans and Standard Drawings (**Three Hundred and Sixty Five (365) calendar days**), and will accept as full payment the prices set forth in the Bidding Sheet.

The undersigned further agrees that he/she shall execute such Contract within ten days from the date of mailing to him of written notice of the Company's acceptance of this proposal and within the same time shall furnish bond(s), along with the required certificates of insurance, and that upon failure to do so within said time, the proposal guaranty shall become the property of the Company as liquidated damages for such failure or refusal, and shall be deposited as moneys belonging to the Company; provided that if said Bidder shall execute the Contract and furnish the required bonds and certificates of insurance within the time aforesaid, his/her proposal guaranty shall be returned to him within ten days thereafter.

Bidder agrees with the Company that if the project is not fully completed within said time, he will pay as liquidated damages, the sum of *$500* for each consecutive calendar day thereafter as provided in Section 6-9 of the Standard Specifications, and that this amount shall be presumed to be the amount of damages sustained by Company in the event of such a breach by Bidder, as it would be impracticable or extremely difficult to fix the actual damage.

BY: _____

TITLE: _____

PROPOSAL
BIDDING SCHEDULING / DECLARATION

The undersigned agrees that all of the work included in the Proposal shall be completed in **Three Hundred and Sixty Five (365) calendar days** as provided in the Contract Plans and Specifications. The undersigned further agrees that in case of default in executing the required Contract with necessary bonds within ten (10) working days, from the date of mailing of a notice from the Company that the Contract has been awarded, the proceeds of the check or bond accompanying his bid shall become the property of San Antonio Water Company.

Licensed in accordance with an Act providing for the registration of Contractors.

LICENSE NUMBER: _____

CONTRACTOR: _____

BY: _____

TITLE: _____

BUSINESS ADDRESS:

_____

_____

_____

If an individual, so state. If a firm is co-partnership, state the firm name, and give the names and addresses of all individuals, co-partners, composing the firm. If a corporation, state the legal name of corporation; also, the names of President, Secretary, manager, and Treasurer thereof, with their business addresses:

_____

_____

Corporate chartered under the laws of the State of: _____

SAMPLE BID SCHEDULE
FOR
NEW OFFICE AND OPERATIONS YARD FACILITIES
CO#1507

Item #	DESCRIPTION OF WORK	SCHEDULE VALUE
01	Grading	
02	Concrete Foundations and Slabs	
03	Framing	

Total Bid (Items 01 thru 03) = $ _____

(IN WORDS) _____

Bidder hereby acknowledges that all bid prices include any amounts payable by Owner for taxes which may result from this proposal

CONTRACTOR: _____

BY: _____

TITLE: _____

BIDDING SHEET

Fill in the prices at which you propose to furnish the scheduled construction, including all labor, materials, equipment, work and methods necessary to complete the work, and all applicable sales and use taxes imposed pursuant to the laws of the State of California.

Bidders are advised that they must include a proportional amount of overhead, profit, sales tax and all other applicable taxes and fees, etc., within the bid prices for each bid item, since the amount of bid under which award will be made, if made, will be determined by the Company after the bids have been received.

All Bidders must bid on all items.

ADDENDA

Bidder acknowledges receipt of the following Addenda:

_____ DATED _____

_____ DATED _____

_____ DATED _____

The Company's policy is to award to the lowest responsive and responsible Bidder.

However, Bidders are advised that Company reserves the right not to make an award. Bidder agrees to perform all the work described in the Contract Documents for the following unit prices or lump sum:

BIDDER'S STATEMENT OF EXPERIENCE AND REFERENCES

Names and addresses of all members of co-partnership or names and titles of all officers of the corporation:

_____

_____

The bidder declares that the surety (sureties) named in the space provided below have agreed to furnish bonds in the amounts set forth in the Instruction to the Bidders, in the event the Contract is awarded on the basis of this proposal.

Names and addresses of surety or sureties agreeing to furnish bond:

_____

_____

Each Bidder (Contractor) is required to furnish work record for Sub-bidders (Subcontractors). List at least two projects each that the Sub-bidders have completed within the past three- (3) years. Responses must be full and explicit. Use reverse side or additional sheets, as necessary. The Sub-bidder's name should correspond to the names of Subcontractors shown on the following page of Subcontractor performing in excess of one-half of one percent of the total bid price.

PROJECT NAME: _____

DESCRIPTION: _____

CONTRACT AMOUNT: $ _____ DATE COMPLETED: _____

OWNER'S NAME: _____

ADDRESS: _____

TELEPHONE NO: ( ) _____

PROJECT NAME: _____

DESCRIPTION: _____

CONTRACT AMOUNT: $ _____ DATE COMPLETED: _____

OWNER'S NAME: _____

ADDRESS: _____

TELEPHONE NO: ( ) _____

PROJECT NAME: _____

DESCRIPTION: _____

CONTRACT AMOUNT: $ _____ DATE COMPLETED: _____

OWNER'S NAME: _____

ADDRESS: _____

TELEPHONE NO: ( ) _____

FINANCIAL STATEMENT

If requested by the Company, the bidder shall furnish a notarized financial statement, references, and other information, sufficiently comprehensive to permit an appraisal of his current financial condition.

SUBCONTRACTORS

List the name and address of **all subcontractors** who will perform work in or about the work or improvement in excess of five percent of the total bid price and indicate what part of the work will be done by each such Contractor. (Submit additional sheets if required.) Only one sub-bidder shall be listed for each portion of work.

If the Contractor fails to specify a subcontractor for any portion of the work in excess of five (5) percent of the total Bid to be performed under the Contract, he shall be deemed to have agreed to perform such portion himself and he shall not be permitted to subcontract that portion of the work except under conditions permitted by law.

Subletting or subcontracting of any portion of the work as to which no subcontractor was designated in the original Bid shall only be permitted in case of public emergency or necessity, or otherwise permitted by law, and then only after a finding reduced to writing as a public record of the Company.

Item No. of Work	Name of Firm/Contractor	Location of Mill/shop/office	% of Item to be Performed by Subcontractor

Has Bidder, as Contractor, been involved in litigation with any owner of any project within the last ten- (10) years? If so, please describe the projects(s) and the nature and results of any litigation including any lawsuits settled prior to trial.

_____

_____

Has any sub-bidder, as contractor, been involved in litigation with any owner of any project within the last ten (10) years? If so, please describe the project(s) and the nature and results of any litigation including any lawsuits settled prior to trial.

_____

_____

_____

_____

List the name of the person who examined the work site of the proposed work for your firm:

_____

Date of Inspection: _____

In submitting a Bid to a purchasing body, the Bidder offers and agrees that if the Bid is accepted, it will assign to the purchasing 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. Section 15) or under the Cartwright Act (Chapter 2 of Part 2 of Division 7 of the business and Professions Code) arising from purchases of goods, materials, or services by the Bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tender's final payment to the Bidder.

RESPECTFULLY SUBMITTED:

SIGNATURE	TITLE
DATE	ADDRESS
TELEPHONE NUMBER	CITY, STATE, ZIP
CONTRACTOR'S LICENSE NO.	TYPE OF LICENSE AND CLASS
FEDERAL IDENTIFICATION NO.	

SEAL (IF BID IS BY A CORPORATION)

ATTEST

CERTIFICATION
LABOR CODE - SECTION 1861

I, the undersigned Contractor, am aware of the provisions of Section 3700 ET. Seq. of the Labor Code 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, the undersigned Contractor, agree to and will comply with such provisions before commencing the performance of the work of this Contract.

CONTRACTOR:

_____
FIRM NAME

BY: _____

BY: _____
SECOND PARTY

NON-COLLUSION AFFIDAVIT

STATE OF CALIFORNIA)

) SS.

COUNTY OF _____)

_____, being first duly sworn, deposes and
(NAME OF AFFIANT)

and says that he/she is _____
(TITLE)

of _____, the part making the foregoing bid; 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 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.

_____
(SIGNATURE)

_____
(TYPED NAME))

SUBSCRIBED BEFORE ME on this _____ day of_____, 2025_____.

_____
(NOTARY PUBLIC)

My Commission Expires: _____

CONTRACTOR'S LICENSING STATEMENT

I, the undersigned Contractor, am aware of State Business and Professions Code, Section 7028.15 which requires that the information shown below shall be included in the bid. Any bid not containing this information, or if this information is subsequently proven to be false shall be considered non-responsive and shall be rejected.

NAME OF CONTRACTOR: _____

BUSINESS ADDRESS: _____

_____

_____

Corporation organized
under the laws of the State of: _____

STATE LICENSE NO. _____

STATE LICENSE CLASSIFICATION _____

STATE LICENSE EXPIRATION DATE _____

I certify under penalty of perjury under the laws of the State of California that the representations made in this Bid are true and correct.

SIGNED _____

TITLE _____

DATE _____

FORM OF BID BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____

_____

as Principal, and _____

as Surety, are hereby held and firmly bound unto San Antonio Water Company as owner in the penal sum of $_____

_____

(in words)

for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

Signed this _____ day of _____, 2026.

The condition of the above obligation is such that, whereas the Principal has submitted to the San Antonio Water Company a certain bid, attached hereto and hereby made a part hereof, to enter into a Contract in writing for:

NEW OFFICE AND OPERATIONS YARD FACILITIES, UPLAND CA

CO#1507

NOW, THEREFORE,

a. If said Bid shall be rejected, or in the alternate,
b. If said Bid shall be accepted and the Principal shall execute and deliver a Contract in the form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a bond for his/her faithful performance of said Contract and shall in all other respects perform the agreement created by the acceptance of said Bid.

Then this obligation shall be void; otherwise, the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

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 an extension of the time within which the Company may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixes and these presents to be signed by their proper officers, the day and year first mentioned.

SEAL

_____
PRINCIPAL

_____
SURETY

BY: _____

AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor
where the basis of payment is a Stipulated Sum

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

San Antonio Water Company, a private nonprofit mutual water company and California corporation
139 N. Euclid Avenue
Upland, California 91786
Telephone: (909) 982-4107 | Owner's Representative: Brian Lee, General Manager

and the Contractor:
(Name, legal status, address and other information)

« »« »
« »
« »
« »

for the following Project:
(Name, location and detailed description)

New Office and Operations Yard Facilities, CO #1507
400 E. 20th Street, Upland, California 91784
Construction of: (a) a 3,887 s.f. Main Office Building (Occupancy B, Type VB, NFPA 13 sprinklered); and (b) a 4,100 s.f. Maintenance/Storage Building (Occupancy S-2/U, NFPA 13 sprinklered), as more fully described in the Contract Documents.

The Architect:
(Name, legal status, address and other information)

Claremont Environmental Design Group, Inc. (CEDG)
401 E Columbia Avenue
Pomona, CA 91767

The Owner and Contractor agree as follows.

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TABLE OF ARTICLES

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EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

§ 1.2 Order of Precedence. In the event of any conflict or inconsistency among the Contract Documents, the following order of precedence shall govern (highest to lowest priority): (1) this Agreement and any executed Change Orders; (2) the Performance Bond and Payment Bond; (3) the Notice Inviting Bids; (4) the Instructions to Bidders; (5) the Non-Collusion Affidavit; (6) the accepted Bid Proposal and Schedule of Values; (7) the Certifications of Required Insurance Coverage and Endorsements; (8) the Special Provisions; (9) the Plans and Drawings; (10) all Addenda (in reverse chronological order); (11) Exhibit A — Insurance and Bonds (AIA A101-2017 Exhibit A); (12) Supplementary Conditions to AIA A201-2017; (13) AIA Document A201-2017 General Conditions of the Contract for Construction, as modified by the Supplementary Conditions; and (14) the CEDG Project Manual, Divisions 01 through 32, dated March 15, 2026, prepared by Claremont Environmental Design Group, Inc., which constitutes the Specifications and is a Contract Document.

§ 1.3 CEDG Project Manual. The CEDG Project Manual (Divisions 01 through 32, dated March 15, 2026, prepared by Claremont Environmental Design Group, Inc.) is a Contract Document and is incorporated herein by reference. In the event of conflict between the Project Manual and the Plans and Drawings, the more stringent requirement shall govern, subject to the order of precedence set forth in Section 1.2.

§ 1.4 A201 General Conditions. AIA Document A201-2017 General Conditions of the Contract for Construction is incorporated herein by reference and is a Contract Document. The A201 is modified by Supplementary Conditions prepared by Owner's counsel. In the event of conflict between the A201 and the Supplementary Conditions, the Supplementary Conditions shall govern.

§ 1.5 Construction Manager; Commissioning Authority. No Construction Manager has been retained for this Project. References to 'Construction Manager' in Division 01 of the CEDG Project Manual shall be treated as references to Owner's Representative (Brian Lee, General Manager, SAWCO). No Commissioning Authority has been retained for this Project. References to 'Commissioning Authority' in Division 01 of the CEDG Project Manual shall be treated as inapplicable.

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ARTICLE 2 THE WORK OF THIS CONTRACT

§ 2.1The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others. The Work consists of the construction of the New Office and Operations Yard Facilities, CO #1507, at 400 E. 20th Street, Upland, California 91784, including: (a) a 3,887 square-foot Main Office Building (Occupancy B, Type VB, NFPA 13 sprinklered); and (b) a 4,100 square-foot Maintenance/Storage Building (Occupancy S-2/U, NFPA 13 sprinklered), together with all site work, utilities, improvements, and other work described in or reasonably inferable from the Contract Documents.

§ 2.2 Owner-Furnished Items. The following items will be furnished by Owner and are not included in the Contract Sum. Contractor is responsible for coordinating with Owner for the installation of these items at the appropriate time during construction, and for providing all required electrical power, data, and communications conduit, rough-in, and connections to and from these items as required by the Contract Documents: (a) communications cabling and terminations; (b) photocopier (s); (c) televisions; (d) desks and workstations; (e) modular furniture and systems furniture; (f) file cabinets and storage furniture. Contractor shall coordinate the installation schedule for Owner-furnished items with Owner's Representative no later than 60 days before the anticipated installation date.

§ 2.3 Contractor's License. Contractor represents and warrants that it holds, and shall maintain throughout the performance of the Work, a valid Class B — General Building Contractor's license issued by the California Contractors State License Board (Business and Professions Code § 7057), and that such license is in good standing and will remain in good standing throughout the Project. Contractor shall require all Subcontractors to hold and maintain valid California contractor's licenses of the appropriate specialty classification for their respective scopes of work (Business and Professions Code § 7058).

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date set forth in a Notice to Proceed issued by Owner to Contractor. Owner shall issue the Notice to Proceed within 60 days after execution of this Agreement and satisfaction of all conditions precedent to commencement, including Contractor's delivery of required bonds and insurance.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

[X] Not later than Three Hundred and Sixty Five (365) calendar days from the date of the Notice to Proceed.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor’s performance of the Contract. The Contract Sum shall be « » ($ « »), subject to additions and deductions as provided in the Contract Documents. The Contract Sum is a fixed-price stipulated sum. Contractor bears the risk of cost overruns. Owner's obligation is limited to the Contract Sum as adjusted by written Change Orders executed by both parties or Construction Change Directives issued by Owner. The Contract Sum includes all costs of labor, materials, equipment, overhead, profit, taxes, insurance, bonds, permits, and all other costs and expenses necessary to complete the Work in strict accordance with the Contract Documents.

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§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

If the Contractor fails to achieve Substantial Completion within the Contract Time (as extended by approved Change Orders only), Contractor shall pay to Owner, as liquidated damages and not as a penalty, the sum of $500 per calendar day for each calendar day of delay beyond the required date of Substantial Completion, until Substantial Completion is achieved. Liquidated damages shall accrue automatically without notice. Owner may deduct accrued liquidated damages from any amounts otherwise due Contractor, including retention. Liquidated damages are not capped at or limited to the amount of retention; Owner retains all rights to collect liquidated damages from any source.

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)
None. No bonus or incentive provisions are included in this Agreement.

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« Applications for Payment shall cover Work performed during the calendar month immediately preceding the date of submission. Contractor shall submit each Application for Payment to Architect no later than the 15th day of each calendar month for Work performed through the last day of the preceding month. »

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the 15th day of a month, Owner shall make payment of the undisputed amount certified by Architect to the Contractor not later than 30 days after Architect's receipt of the Application for Payment. If an Application for Payment is received by the Architect after the 15th day of a month, payment of the undisputed amount certified shall be made by Owner not later than 30

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days after the Architect receives the Application for Payment. If Owner disputes any portion of an Application for Payment, Owner shall notify Contractor in writing within 7 days of receipt, identifying the disputed amount and the basis for the dispute, and shall pay the undisputed portion within the 30-day period. [California Civil Code § 8800 (private works prompt payment) requires Owner to pay undisputed amounts within 30 days of receipt. Interest on late payments accrues at the legal rate under Civil Code § 8800.]

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment. Contractor shall submit the Schedule of Values to Architect for approval within 20 days of the date of the Notice to Proceed, organized by CSI MasterFormat division or trade. No Application for Payment shall be processed until the Schedule of Values has been approved by Architect.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. Each Application for Payment shall be submitted on AIA Document G702/G703 (Application and Certificate for Payment and Continuation Sheet) or on such other form as Owner may approve in writing. Each Application for Payment shall be accompanied by the following:

.1 A Conditional Waiver and Release on Progress Payment (California Civil Code § 8132 statutory form) from Contractor, covering the amount of the current Application for Payment;

.2 Conditional Waivers and Releases on Progress Payment (California Civil Code § 8132 statutory form) from each Subcontractor and material supplier who provided labor, materials, or equipment during the period covered by the Application;

.3 Unconditional Waivers and Releases on Progress Payment (California Civil Code § 8134 statutory form) from Contractor and each Subcontractor and material supplier for all prior payment periods for which payment has been received; and

.4 Such other supporting documentation as Owner or Architect may reasonably require.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and

.5 Retainage withheld pursuant to Section 5.1.7.

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§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner shall withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

« Five (5%) of the amount of each approved Application for Payment. »

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

« »

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

Retainage shall not be released at Substantial Completion. Retainage shall be released only as part of Final Payment as provided in Section 5.2, subject to Owner's withholding rights. In addition, Owner may withhold from any progress payment (in addition to retainage) amounts sufficient to protect Owner from loss on account of: (a) defective Work not remedied; (b) third-party claims filed or reasonable evidence indicating probable filing; (c) mechanic's lien claims, stop payment notices, or payment bond claims; (d) failure of Contractor to make payments to Subcontractors or material suppliers; (e) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum; (f) damage to Owner or another contractor; (g) failure to carry out the Work in accordance with the Contract Documents; (h) liquidated damages accrued or accruing; (i) failure to maintain required insurance or bonds; (j) unresolved claims by Owner against Contractor; or (k) failure to provide required lien releases or other closeout documents.

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when all of the following conditions have been satisfied:

.1 Contractor has fully performed the Contract, including completion of all punch list items, in strict accordance with the Contract Documents;

.2 Architect has issued a final Certificate for Payment;

.3 Owner has recorded a Notice of Completion pursuant to California Civil Code § 8182;

.4 Contractor has submitted all of the following closeout documents to Owner:

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(a) Unconditional Waiver and Release on Final Payment (California Civil Code § 8138 statutory form) from Contractor, covering the full Contract Sum;
(b) Unconditional Waivers and Releases on Final Payment (California Civil Code § 8138 statutory form) from all Subcontractors and material suppliers who provided labor, materials, or equipment to the Project;
(c) Consent of Surety to Final Payment (AIA G707 or equivalent form acceptable to Owner);
(d) Certificate of Occupancy or equivalent final inspection approval from the City of Upland Building Department;
(e) Operation and maintenance manuals for all equipment and systems installed in the Work;
(f) Record drawings (as-built drawings) reflecting all changes made during construction;
(g) All warranties and guarantees required by the Contract Documents;
(h) All keys, access cards, security codes, and access devices;
(i) Final accounting of all Change Orders and adjustments to the Contract Sum; and
(j) All other closeout documents required by the Contract Documents, including those required by Division 01 of the CEDG Project Manual.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the later of: (a) Architect's issuance of the final Certificate for Payment; or (b) recordation of the Notice of Completion pursuant to California Civil Code § 8182; provided that all conditions in Section 5.2.1 have been satisfied. [California Civil Code § 8812 provides that for private works, Owner must release retention within 45 days after recordation of the Notice of Completion. The 30-day period proposed here is more favorable to Contractor than the 45-day statutory maximum but is permissible. Owner retains all withholding rights under Section 5.1.7.3.]

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

The legal rate under California law (currently 10 % per annum under California Civil Code § 3289 (b)). [California Civil Code § 8800 provides for interest on late payments on private works at the legal rate.]

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker. Owner reserves the right to replace the Architect as Initial Decision Maker if Architect's authority is terminated or if Architect has a conflict of interest with respect to the dispute at issue.

Notwithstanding the foregoing, if CEDG (Claremont Environmental Design Group, Inc.) is awarded the Contract as Contractor, CEDG shall not serve as Architect or Initial Decision Maker under this Agreement. In that event, Owner shall, prior to issuance of the Notice to Proceed, retain an independent, licensed architect or qualified project management firm (the 'Independent Contract Administrator') to perform all functions assigned to the Architect under the Contract Documents, including without limitation: (a) review and certification of Applications for Payment; (b) issuance of Certificates for Payment; (c) conduct of site visits and preparation of site observation reports; (d) review and approval of submittals; (e) issuance of Architect's Supplemental Instructions; (f) certification of Substantial Completion; and (g) serving as Initial Decision Maker pursuant to Article 15. The Independent Contract Administrator shall be named in a written amendment to this Agreement executed before issuance of the Notice to Proceed. All references in the Contract Documents to 'Architect' in the context of contract administration (as distinguished from design) shall be deemed to refer to the Independent Contract Administrator once named. CEDG's Instruments of Service (design documents) shall remain in effect, and the Independent Contract Administrator shall administer the Contract based on those documents.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

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§ 6.2 Binding Dispute Resolution

Before either party may demand binding dispute resolution under Section 6.3, all disputes, claims, or controversies arising out of or relating to this Agreement, the Contract Documents, or the Work shall first be submitted to non-binding mediation under the American Arbitration Association Construction Industry Mediation Procedures (or such other mediation rules as the parties may agree in writing). The mediation demand must be made within a reasonable time after the dispute arises. If mediation does not resolve the dispute within 60 days of the mediation demand (or such longer period as the parties agree in writing), either party may proceed to binding dispute resolution under Section 6.3. The cost of mediation shall be shared equally by the parties.

§ 6.3 Binding Dispute Resolution. For any Claim subject to, but not resolved by, mediation pursuant to Section 6.2 and Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201-2017, administered by the American Arbitration Association under its Construction Industry Arbitration Rules then in effect. The arbitration shall be conducted in San Bernardino County, California. Number of arbitrators: one (1) for disputes involving amounts of $5,000,000 or less; three (3) for disputes involving amounts exceeding $5,000,001 The arbitrator (s)' decision shall be final and binding and may be entered as a judgment in any court of competent jurisdiction.

[ ] Litigation in the Superior Court of the State of California, County of San Bernardino, or, if federal jurisdiction exists, in the United States District Court for the Central District of California. Each party hereby consents to the personal jurisdiction of such courts and waives any objection to venue in such courts.

§ 6.4 Work Continues. Contractor shall not stop or slow the Work pending resolution of any dispute, claim, or controversy. Contractor's obligation to continue the Work during any dispute is a material term of this Agreement.

§ 6.5 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of California, without regard to its conflict of laws principles.

§ 6.6 Venue. Venue for any litigation or arbitration proceeding arising out of or related to this Agreement shall be in San Bernardino County, California.

§ 6.7 Attorney Fees. The prevailing party in any arbitration or litigation arising out of or related to this Agreement shall be entitled to recover its reasonable attorneys' fees and costs from the non-prevailing party, as determined by the arbitrator or court.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Termination for Cause by Owner. Owner may terminate this Agreement for cause upon 7 days' written notice to Contractor if Contractor: (a) fails to prosecute the Work diligently or persistently refuses or fails to supply enough properly skilled workers or proper materials; (b) fails to correct defective Work within the time required by the Contract Documents; (c) fails to maintain required insurance or bonds; (d) becomes insolvent, makes a general assignment for the benefit of creditors, or has a receiver, trustee, or liquidator appointed; (e) fails to make payments to Subcontractors or material suppliers when due; (f) abandons the Work; (g) persistently disregards applicable laws, ordinances, rules, regulations, or orders of a public authority having jurisdiction; or (h) otherwise materially breaches this Agreement and fails to cure such breach within 7 days of written notice from Owner (or such longer period as is reasonably necessary to cure, provided Contractor commences cure within 7 days and diligently pursues it to completion). Upon termination for cause, Owner may take possession of the Project site and all materials, equipment, tools, and construction equipment thereon and may complete the Work by any lawful means. Contractor shall be liable for all costs of completion in excess of the unpaid Contract Sum, plus all liquidated damages and other damages sustained by Owner as a result of Contractor's default.

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§ 7.2 Termination for Convenience by Owner. Owner may terminate this Agreement for Owner's convenience, without cause, upon 14 days' written notice to Contractor. Upon termination for convenience, Contractor shall be entitled to payment for: (a) Work properly performed and completed in accordance with the Contract Documents prior to the effective date of termination; (b) reasonable, documented costs of demobilization directly attributable to the termination; and (c) a reasonable profit on Work actually performed prior to termination. Contractor shall not be entitled to lost profits on unperformed Work, anticipated overhead on unperformed Work, or any other consequential, special, or punitive damages arising from termination for convenience. Such payment shall constitute Contractor's sole and exclusive remedy for termination for convenience.

§ 7.3 Suspension by Owner. Owner may suspend the Work, in whole or in part, for Owner's convenience upon written notice to Contractor. During any suspension, Contractor shall protect and preserve the Work and shall comply with Owner's instructions regarding the Project site. If a suspension ordered by Owner for Owner's convenience exceeds 90 consecutive days in the aggregate, Contractor may, upon 7 days' written notice to Owner, terminate this Agreement for Owner's convenience, in which case Contractor shall be entitled to the payments described in Section 7.2. Contractor shall not be entitled to any additional compensation for a suspension of 90 days or less.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

Brian Lee, General Manager
San Antonio Water Company
139 N. Euclid Avenue
Upland, California 91786
Telephone: (909) 982-4107
Email: [blee@sawaterco.com

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.]

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.5.3 Contractor shall furnish a 100% Performance Bond and a 100% Payment Bond, each on AIA Document A312-2010 form (with California rider), prior to commencement of the Work. Both bonds shall be executed by a surety company admitted to do business in the State of California and rated no less than 'A-' VIII in the most current

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edition of A.M. Best's Insurance Reports, with power of attorney attached and notarized. Owner shall record the direct contract and the Payment Bond with the San Bernardino County Recorder before commencement of the Work, pursuant to California Civil Code § 8600, to restrict mechanic's lien enforcement.

§ 8.6 Notices. Written notice shall be deemed duly served if: (a) delivered in person to the individual or to an officer of the party for which it was intended; (b) sent by certified mail, return receipt requested, postage prepaid, to the last known business address of the party; or (c) sent by nationally recognized overnight courier (e.g., FedEx, UPS) with tracking confirmation, to the last known business address of the party. Notice by certified mail or overnight courier shall be effective upon delivery or upon the first attempted delivery if delivery is refused. Electronic notice shall be effective only if sent to the email addresses designated in Sections 8.2 and 8.3 of this Agreement and if the sender receives an electronic confirmation of delivery or read receipt. Electronic notice shall not be effective for notices of termination, notices of default, or notices of claim, which shall be given by the methods specified in (a), (b), or (c) above.

§ 8.7 Governing Law; Venue. This Agreement shall be governed by and construed in accordance with the laws of the State of California, without regard to its conflict of laws principles. Venue for any litigation arising out of or related to this Agreement that is not subject to arbitration under Section 6.3 shall be exclusively in the Superior Court of the State of California, County of San Bernardino, or, if federal jurisdiction exists, in the United States District Court for the Central District of California. Each party hereby consents to the personal jurisdiction of such courts and waives any objection to venue in such courts.

§ 8.8 Entire Agreement. This Agreement, together with the other Contract Documents enumerated in Article 9, constitutes the entire agreement between Owner and Contractor with respect to the subject matter hereof and supersedes all prior written or oral understandings, negotiations, representations, and agreements. This Agreement may only be amended, supplemented, modified, or canceled by a duly executed written instrument signed by both parties. No oral modification of this Agreement shall be effective.

§ 8.9 Severability. If any provision of this Agreement is held void, invalid, or unenforceable under any applicable law or regulation, such provision shall be deemed stricken, and all remaining provisions shall continue in full force and effect.

§ 8.10 Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument. Electronic signatures (including PDF signatures) shall be deemed original signatures for all purposes.

§ 8.11 Assignment. Neither party may assign this Agreement, in whole or in part, without the prior written consent of the other party. Any purported assignment without prior written consent is void and of no effect. Notwithstanding the foregoing, Owner may assign this Agreement without Contractor's consent to any successor entity, lender, or governmental authority as required by applicable law or financing arrangements.

§ 8.12 Survival. The following provisions shall survive the expiration or earlier termination of this Agreement: Article 6 (Dispute Resolution), Section 8.7 (Governing Law; Venue), Section 8.13 (Private Work Disclosure), and any other provisions that by their nature are intended to survive termination or expiration.

§ 8.13 Private Work Disclosure. Owner understands that this Project is a private work of improvement and is not subject to California prevailing wage requirements under Labor Code §§ 1720 et seq. Contractor remains solely responsible for determining and complying with all labor, employment, licensing, tax, safety, and wage laws applicable to its Work and the Work of its Subcontractors. Contractor's bid and Contract Sum shall include all costs of compliance with applicable law. If any governmental authority or court later determines that prevailing wage or public works labor compliance requirements apply to this Project, Contractor shall comply with those requirements, and the parties' rights regarding any resulting cost or time impact shall be determined under the Contract Documents and applicable law. Owner makes no representation that prevailing wage requirements do not apply, and Contractor shall not rely on Owner's characterization of the Project as a private work as a defense to any labor compliance obligation.

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§ 8.14 Workers' Compensation. Contractor shall comply with California Labor Code § 3700 et seq. and shall maintain workers' compensation insurance covering all employees performing Work on the Project. Contractor shall execute the Workers' Compensation Certification (Labor Code § 1861) in the form included in the Bid Documents before commencing Work. Contractor shall require all Subcontractors to comply with this requirement.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents, listed in order of precedence as established in Section 1.2 of this Agreement:

.1 This AIA Document A101-2017, Standard Form of Agreement Between Owner and Contractor (Stipulated Sum), as modified;

.2 All executed Change Orders and Construction Change Directives issued after execution of this Agreement;

.3 Performance Bond (AIA A312-2010 or equivalent, 100% of Contract Sum);

.4 Payment Bond (AIA A312-2010 or equivalent, 100% of Contract Sum);

.5 Notice Inviting Bids;

.6 Instructions to Bidders;

.7 Non-Collusion Affidavit;

.8 Accepted Bid Proposal and Schedule of Values;

.9 Certifications of Required Insurance Coverage and Endorsements;

.10 Special Provisions;

.11 Plans and Drawings (see list in Section 9.1.5 below);

.12 All Addenda (in reverse chronological order);

.13 AIA A101-2017 Exhibit A — Insurance and Bonds, as modified;

.14 Supplementary Conditions to AIA A201-2017; see Section 9.1.8 below;

.15 AIA Document A201-2017, General Conditions of the Contract for Construction, as modified by Supplementary Conditions;

.16 CEDG Project Manual, Divisions 01 through 32, dated March 15, 2026, prepared by Claremont Environmental Design Group, Inc.

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[« »] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

« »

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[« »] The Sustainability Plan:

Title	Date	Pages

[X] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
SAWCO_AIA_A201_SupplementaryConditions	Supplementary Conditions to AIA A201-2017 General Conditions of the Contract for Construction	[INSERT]	[INSERT]

.9 Other documents, if any, listed below:
The following documents are incorporated into the Contract Documents pursuant to Section 9.1 above and the order of precedence established in Section 1.2: - Workers' Compensation Certification (Labor Code § 1861); - Bid Security (cashier's check, certified check, or bid bond — 10% of bid amount); - All permits obtained by Contractor for the Work.

« »

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*	CONTRACTOR *(Signature)*
« »« »	« »« »
(Printed name and title)	*(Printed name and title)*

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AIA® Document A312® – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

[TO BE INSERTED AT CONTRACT AWARD]

SURETY:
(Name, legal status and principal place of business)

[TO BE INSERTED AT CONTRACT AWARD]

OWNER:
(Name, legal status and address)
San Antonio Water Company, a private nonprofit mutual water company and California corporation 139 N. Euclid Avenue Upland, California 91786 Attn: Brian Lee, General Manager | Tel: (909) 982-4107

CONSTRUCTION CONTRACT
Date: [TO BE INSERTED — Date of execution of AIA A101-2017 Agreement]
Amount: $[TO BE INSERTED AT CONTRACT AWARD — 100% of the Contract Sum (stipulated sum) as set forth in AIA A101-2017 Agreement, § 4.1. Bond penal sum equals 100% of the Contract Sum.]
Description:
(Name and location)
New Office and Operations Yard Facilities, CO #1507 400 E. 20th Street, Upland, California 91784 Two buildings: (a) 3,887 s.f. Main Office Building (Occupancy B, Type VB, NFPA 13 sprinklered); and (b) 4,100 s.f. Maintenance/Storage Building (Occupancy S-2/U, NFPA 13 sprinklered). Owner: San Antonio Water Company. Architect: Claremont Environmental Design Group, Inc. (CEDG), 480 North Indian Hill Boulevard, Claremont, California 91711 (or Independent Contract Administrator if CEDG is awarded the Contract as Contractor).

BOND
Date:
(Not earlier than Construction Contract Date)

Amount: $[TO BE INSERTED AT CONTRACT AWARD — Same amount as Construction Contract penal sum: 100% of Contract Sum]
Modifications to this Bond: See § 18 (Modifications) on the last page of this Bond. California rider modifications apply.

(Any additional signatures appear on the last page of this Payment Bond.)

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*

Signature: _____
Name and Title:

SURETY
Company: *(Corporate Seal)*

Signature: _____
Name and Title:

(FOR INFORMATION ONLY — Name, address and telephone)

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User Notes: (640e2aedf442e4498d0967ee)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

Claremont Environmental Design Group, Inc. (CEDG) 480 North
401 E Columbia Avenue,
Pomona, California 91767
Attn: Erik Peterson

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

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§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

.1 the name of the Claimant;
.2 the name of the person for whom the labor was done, or materials or equipment furnished;
.3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
.4 a brief description of the labor, materials or equipment furnished;
.5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
.6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
.7 the total amount of previous payments received by the Claimant; and
.8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

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§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:
CALIFORNIA RIDER — PAYMENT BOND MODIFICATIONS

.1. Section 1, line 3, after "as provided in the Contract," insert: "and as required by California Civil Code §§ 8600–8614,".

.2 Section 1, after the first sentence, insert: "This Bond shall inure to the benefit of any person or entity entitled to assert a claim under a stop payment notice under California law, including but not limited to those described in Civil Code §§ 8100 et seq. and 9350 et seq."

.3 Section 12, replace "one year" with "four years" and add: "The limitation period for any action on this Bond shall be four (4) years from the date the cause of action accrues, consistent with California Code of Civil Procedure § 337.

.4 The Surety on this Bond must be admitted to transact surety insurance in the State of California, must have an A.M. Best rating of not less than A-/VIII, and must be the same surety as on the Performance Bond for this Contract.

.5 Nothing in this Bond shall be construed to limit, waive, or impair any rights or remedies of claimants under the California Civil Code, including but not limited to the notice and claim provisions of Civil Code §§ 8100 et seq. and 9000 et seq. To the extent of any conflict between this Bond and California law, California law shall control.

.6 This Bond shall be governed by and construed in accordance with the laws of the State of California. Venue for any action or proceeding arising out of or relating to this Bond shall be in the Superior Court of the State of California, County of San Bernardino.

.7 The Surety acknowledges that, upon recordation of a Notice of Completion pursuant to California Civil Code § 8182, the time periods for claimants to assert claims against this Bond may be shortened as provided by law.

.8 Pursuant to California Civil Code § 8600, the Owner must record this Payment Bond in the office of the county recorder in the county where the real property is located before commencement of work under the Contract.

.9 This Bond is issued in connection with a private works project subject to the requirements of California Civil Code §§ 8000 et seq.

.10 The parties acknowledge that CEDG serves as both Architect/Engineer and Owner's Representative/ Initial Construction Administrator (ICA) for the Project, and the Surety waives any objection to the ICA structure as set forth in the Contract Documents.

(Any additional signatures appear on the last page of this Payment Bond)

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

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AIA® Document A312® – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

[TO BE INSERTED AT CONTRACT AWARD]

SURETY:
(Name, legal status and principal place of business)

TO BE INSERTED AT CONTRACT AWARD]

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date: [TO BE INSERTED — Date of execution of AIA A101-2017 Agreement between Owner and Contractor]
Amount: $[TO BE INSERTED AT CONTRACT AWARD — 100% of the Contract Sum (stipulated sum) as set forth in AIA A101-2017 Agreement, § 4.1. Bond penal sum equals 100% of the Contract Sum.]
Description:
(Name and location)
New Office and Operations Yard Facilities, CO #1507 400 E. 20th Street, Upland, California 91784 Two buildings: (a) 3,887 s.f. Main Office Building (Occupancy B, Type VB, NFPA 13 sprinklered); and (b) 4,100 s.f. Maintenance/Storage Building (Occupancy S-2/U, NFPA 13 sprinklered). Owner: San Antonio Water Company. Architect: Claremont Environmental Design Group, Inc. (CEDG), 480 North Indian Hill Boulevard, Claremont, California 91711 (or Independent Contract Administrator if CEDG is awarded the Contract as Contractor).

BOND
Date: [TO BE INSERTED — Same date as or after the Construction Contract Date. Bond must be dated no earlier than the Construction Contract Date per AIA A312-2010 requirements.]
(Not earlier than Construction Contract Date)

Amount: $[TO BE INSERTED AT CONTRACT AWARD — Same amount as Construction Contract penal sum: 100% of Contract Sum]
Modifications to this Bond: See § 16 (Modifications) on the last page of this Bond.

(Any additional signatures appear on the last page of this Performance Bond.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and		Name and	

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User Notes: (640e2aedf442e4498d0967ef)

Title: _____ Title: _____

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

Claremont Environmental Design
Group, Inc. (CEDG)
401 E Columbia Avenue
Pomona, California 91711
Attn: Erik Peterson

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from

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the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

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.1 This Bond shall be governed by and construed in accordance with the laws of the State of California, without regard to conflict of law principles. Venue for any action or proceeding arising out of or relating to this Bond shall be exclusively in the Superior Court of the State of California, County of San Bernardino.

.2 The Surety must be an admitted surety insurer in the State of California, with a current A.M. Best rating of not less than A-, Class VIII.

.3 The Surety's liability under this Bond expressly includes, and is not limited by, the coverage of liquidated damages as set forth in Section 7.3 of this Bond and as specified in the Contract Documents. The applicable liquidated damages rate is as stated in A101 § 4.5.

.4 Any action on this Bond may be commenced at any time within four (4) years after the date on which the Principal ceased work on the Contract, notwithstanding any shorter period stated in Section 9 of this Bond. This provision is intended to conform to California Code of Civil Procedure § 337.

.5 Nothing in this Bond shall be construed to limit or waive any rights or remedies of the Owner under California law, including but not limited to those provided by California Civil Code §§ 8152, 8600 et seq., and 9550 et seq.

.6 The Surety waives any right to require the Owner to exhaust remedies against the Principal before pursuing the Surety under this Bond, to the extent permitted by California law.

.7 The Surety acknowledges and agrees that CEDG is acting in a dual role as both the Architect/Engineer and the Owner's Representative/Initial Construction Administrator (ICA) under the Contract Documents, and the Surety waives any objection to the ICA structure as set forth in the Contract Documents.

.8 This Bond is issued in connection with a private works project subject to the requirements of California Civil Code §§ 8000 et seq.

.9 Pursuant to California Civil Code § 8600, a copy of this Bond must be recorded with the County Recorder in the county in which the real property is located if required by the Contract Documents.

(Any additional signatures appear on the last page of this Performance Bond)

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

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User Notes: (640e2aedf442e4498d0967ef)

SUPPLEMENTARY CONDITIONS TO AIA DOCUMENT A201-2017
GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

SAN ANTONIO WATER COMPANY
NEW OFFICE AND OPERATIONS YARD FACILITIES
CO#1507 | 400 E. 20TH STREET, UPLAND, CALIFORNIA 91784

PRELIMINARY STATEMENT

These Supplementary Conditions modify, amend, delete, and supplement AIA Document A201-2017, General Conditions of the Contract for Construction ("General Conditions"). Where a provision of these Supplementary Conditions conflicts with a provision of the General Conditions, these Supplementary Conditions shall govern. Where these Supplementary Conditions are silent, the General Conditions shall apply without modification.

These Supplementary Conditions are incorporated into and made a part of the Contract Documents. Capitalized terms used but not defined herein have the meanings given to them in the General Conditions.

All references to "Section" herein refer to sections of the General Conditions (AIA A201-2017) unless otherwise specified.

Governing Law: California. This Project is a private work of improvement. See Section SC-13.8 (Private Work Disclosure) below.

ARTICLE SC-1 — ORDER OF PRECEDENCE AND SUPPLEMENTARY CONDITIONS GOVERNANCE

SC-1.1 Precedence of Supplementary Conditions

In the event of any conflict or inconsistency between these Supplementary Conditions and AIA Document A201-2017, these Supplementary Conditions shall govern. In the event of any conflict or inconsistency among the Contract Documents, the following order of precedence shall govern (highest to lowest priority):

1. The Agreement between Owner and Contractor (AIA A101-2017, as modified) and any executed Change Orders;
2. The Performance Bond and Payment Bond;
3. The Notice Inviting Bids;
4. The Instructions to Bidders;
5. The Non-Collusion Affidavit;
6. The accepted Bid Proposal and Schedule of Values;

7. Certifications of Required Insurance Coverage and Endorsements;
8. The Special Provisions;
9. The Plans and Drawings;
10. All Addenda (in reverse chronological order, with later Addenda taking precedence over earlier Addenda); and
11. Exhibit A — Insurance and Bonds (AIA A101-2017 Exhibit A) (but as modified by item (12 below);
12. These Supplementary Conditions to AIA Document A201-2017 General Conditions of the Contract for Construction, which govern over item (13) in the event of conflict.
13. AIA Document A201-2017 General Conditions of the Contract for Construction (as modified by items (11) and (12) above)

The CEDG Project Manual (Divisions 01 through 32, prepared by Claremont Environmental Design Group, Inc.) constitutes the Specifications and is a Contract Document. In the event of conflict between the Project Manual and the Plans and Drawings, the more stringent requirement shall govern, subject to the order of precedence set forth above.

ARTICLE SC-2 — MODIFICATIONS TO ARTICLE 1 (GENERAL PROVISIONS)

SC-2.1 Section 1.1.1 is amended by adding the following at the end:

The Contract Documents include, in order of precedence, the documents listed in Section SC-1.1 above. The CEDG Project Manual (Divisions 01 through 32) constitutes the Specifications and is a Contract Document. In the event of conflict between the General Conditions and these Supplementary Conditions, these Supplementary Conditions shall govern.

SC-2.2 Section 1.1.3 is amended by adding the following at the end:

For this Project, the Work consists of the construction of the New Office and Operations Yard Facilities, CO#1507, at 400 E. 20th Street, Upland, California 91784, including: (a) a 3,887 square-foot Main Office Building (Occupancy B, Type VB, NFPA 13 sprinklered); and (b) a 4,100 square-foot Maintenance/Storage Building (Occupancy S-2/U, NFPA 13 sprinklered), together with all site work, utilities, improvements, and other work described in or reasonably inferable from the Contract Documents.

SC-2.3 Section 1.6.1 is amended by adding the following at the end:

Notice of Claims shall be provided within 7 calendar days after the event giving rise to the claim first becomes apparent to the notifying party, as a condition precedent to any recovery. See Section 15.1.3 (as modified by Section SC-15.2 below) and Section 13.7 (as modified by Section SC-13.7 below).

ARTICLE SC-3 — MODIFICATIONS TO ARTICLE 2 (OWNER)

SC-3.1 Section 2.1.1 is amended by adding the following at the end:

The Owner's designated representative is Brian Lee, General Manager, San Antonio Water Company, 139 N. Euclid Avenue, Upland, California 91786, Telephone: (909) 982-4107. The Architect does not have authority to bind the Owner to Change Orders exceeding the Board-approval threshold established in Section SC-7.2 below.

SC-3.2 Section 2.2 is amended by adding the following new Section 2.2.5:

§ 2.2.5 Owner-Furnished Items. The following items will be furnished by Owner and are not included in the Contract Sum: (a) communications cabling and terminations; (b) photocopier(s); (c) televisions; (d) desks and workstations; (e) modular furniture and systems furniture; (f) file cabinets and storage furniture. Contractor is responsible for all required electrical power, data, and communications conduit, rough-in, blocking, connections, and coordination work for Owner-furnished items. Contractor shall coordinate the installation schedule for Owner-furnished items with Owner's Representative no later than 60 days before the anticipated installation date.

SC-3.3 Section 2.3 is amended by adding the following new Section 2.3.7:

§ 2.3.7 Construction Manager; Commissioning Authority. No Construction Manager has been retained for this Project. References to "Construction Manager" in Division 01 of the CEDG Project Manual shall be treated as references to Owner's Representative (Brian Lee, General Manager, SAWCO). SAWCO has confirmed no Construction Manager will be retained. CEDG shall revise Division 01 accordingly before bid issuance to replace all "Construction Manager" references with "Owner's Representative."

No Commissioning Authority has been retained for this Project. References to "Commissioning Authority" in Division 01 of the CEDG Project Manual shall be treated as inapplicable. SAWCO has confirmed no CA will be retained. CEDG shall remove or bracket all "Commissioning Authority" references in Division 01 before bid issuance.

SC-3.4 Section 2.4 is amended by adding the following at the end:

Owner's right to stop the Work under this Section 2.4 is in addition to, and not in lieu of, Owner's right to terminate the Contract for cause under Section 14.2. Owner's exercise of the right to stop the Work shall not constitute a waiver of any other right or remedy available to Owner.

SC-3.5 Section 2.5 is amended as follows:

Delete "ten-day period" and replace with "seven (7) day period." Add the following at the end of Section 2.5: Owner's right to carry out the Work under this Section 2.5 is in addition to, and not in lieu of, Owner's right to terminate the Contract for cause under Section 14.2. Contractor shall be liable for all costs incurred by Owner in carrying out the Work, including Owner's administrative costs and the Architect's additional services fees.

ARTICLE SC-4 — MODIFICATIONS TO ARTICLE 3 (CONTRACTOR)

SC-4.1 Section 3.1.1 is amended by adding the following after the sentence "The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located.":

Contractor represents and warrants that it holds, and shall maintain throughout the performance of the Work, a valid Class B — General Building Contractor's license issued by the California Contractors State License Board (Business and Professions Code § 7057), and that such license is in good standing and will remain in good standing throughout the Project. Under Business and Professions Code § 7031, an unlicensed contractor is barred from recovering compensation for its work. Contractor's failure to maintain a valid license shall constitute a material breach of this Contract.

SC-4.2 Section 3.2.2 is amended by adding the following at the end:

Contractor shall also promptly report any such errors, inconsistencies, or omissions directly to Owner's Representative in addition to reporting to the Architect. Contractor's obligation to review and report is a continuing obligation throughout the performance of the Work.

SC-4.3 Section 3.5.1 is amended by adding the following at the end:

Contractor's warranty obligations shall survive Final Completion and termination of this Contract. The one-year correction period under Section 12.2.2 shall commence upon Substantial Completion. Contractor's warranty obligations do not limit Owner's rights under longer manufacturer or Subcontractor warranties, or under applicable California law, including any implied warranties that cannot be waived by contract.

SC-4.4 Section 3.7.1 is amended by adding the following at the end:

Contractor shall hold and maintain, throughout the performance of the Work, a valid Class B — General Building Contractor's license (Business and Professions Code § 7057). All Subcontractors shall hold and maintain valid California contractor's licenses of the appropriate specialty classification for their respective scopes of work (Business and Professions Code § 7058). Contractor shall verify the license status of all Subcontractors before entering into any subcontract and shall re-verify license status before each Subcontractor commences work.

SC-4.5 Section 3.9.1 is amended by adding the following at the end:

The superintendent shall be present at the Project site at all times during the performance of the Work. The superintendent shall not be replaced without Owner's prior written consent, which shall not be unreasonably withheld or delayed. Contractor shall not assign the superintendent to any other project during the performance of the Work without Owner's prior written consent.

SC-4.6 Section 3.10.1 is amended by adding the following at the end:

The construction schedule shall be prepared using critical path method (CPM) scheduling software and shall identify the critical path and all near-critical activities. The schedule shall be updated monthly and submitted to Owner and Architect with each Application for Payment. Failure to maintain and submit an updated schedule shall be grounds for withholding certification of payment.

SC-4.7 Section 3.11 is amended by adding the following at the end:

Contractor shall maintain a complete set of record documents (as-built drawings) at the Project site, updated on a weekly basis to reflect all field changes, substitutions, and deviations from the Contract Documents. Record documents shall be delivered to Architect in electronic format (PDF and CAD/BIM native format) as a condition of Final Completion and release of retention.

SC-4.8 Section 3.12 is amended by adding the following new Section 3.12.11:

§ 3.12.11 Submittal Procedures. All submittals shall be made in accordance with Division 01 Section 013300 (Submittal Procedures) of the CEDG Project Manual.

SC-4.9 Section 3.15.1 is amended by adding the following at the end:

Contractor shall maintain the Project site in a clean, orderly, and safe condition at all times during construction. Contractor shall remove all waste materials, debris, and surplus materials from the site on a daily basis. At Substantial Completion, Contractor shall perform a thorough cleaning of all interior and exterior surfaces, including removal of all construction debris, dust, and protective coverings, and shall leave the Project in a condition ready for immediate occupancy and use by Owner.

SC-4.10 Section 3.18.1 is deleted in its entirety and replaced with the following:

§ 3.18.1 To the fullest extent permitted by law, Contractor shall defend (with counsel reasonably acceptable to Owner), indemnify, and hold harmless Owner and its officers, directors, agents, and employees from and against any and all claims, demands, causes of action, losses, damages, liabilities, costs, and expenses (including reasonable attorneys' fees and court costs) arising out of or relating to the Work, to the extent caused by the negligent acts or omissions or willful misconduct of Contractor, its Subcontractors, or anyone directly or indirectly employed by them. Contractor's indemnity obligation shall not extend to claims to the extent caused by the sole negligence, active negligence, or willful misconduct of Owner or its design professionals. The defense obligation is separate from and independent of the indemnity obligation and shall arise upon tender of defense by Owner, regardless of any reservation of rights by Contractor. This indemnity is intended to comply with California Civil Code § 2782 and shall be construed accordingly.

ARTICLE SC-4A — CEDG DUAL ROLE; INDEPENDENT CONTRACT ADMINISTRATOR

SC-4A.1 Bidding by Design Architect.

SAWCO has authorized Claremont Environmental Design Group, Inc. (CEDG), the design architect for this Project, to submit a bid as General Contractor on this Project. All bidders, including CEDG, are required to submit bids on an equal basis. CEDG's status as the design architect does not give CEDG any competitive advantage in the bidding process; all bidders have equal access to the Contract Documents and bid materials.

SC-4A.2 Conflict of Interest; Mandatory Separation of Roles.

If CEDG is the successful bidder and is awarded the Contract as Contractor, CEDG shall not serve in any Architect or contract administration capacity under the Contract Documents. The following separation of roles is mandatory:

(a) CEDG as Contractor: CEDG shall perform the Work as Contractor in strict accordance with the Contract Documents, including CEDG's own Instruments of Service (design documents).

(b) Independent Contract Administrator: Owner shall retain, prior to issuance of the Notice to Proceed, an Independent Contract Administrator ("ICA") — a separate, independent, licensed California architect or qualified construction management firm — to perform all functions assigned to the Architect under the Contract Documents, including without limitation:

(i) Review and certification of Applications for Payment;

(ii) Issuance of Certificates for Payment;

(iii) Conduct of site visits and preparation of site observation reports;

(iv) Review and approval of shop drawings, product data, samples, and other submittals;

(v) Issuance of Architect's Supplemental Instructions, Proposal Requests, and Construction Change Directives;

(vi) Certification of Substantial Completion;

(vii) Issuance of the final Certificate for Payment; and

(viii) Serving as Initial Decision Maker pursuant to Article 15 of the General Conditions.

(c) ICA Qualifications: The ICA must be: (i) a licensed California architect or a qualified construction management firm with demonstrated experience administering AIA A201 construction contracts for projects of similar scope and value; (ii) completely independent of CEDG, with no financial relationship, shared ownership, or other affiliation with CEDG; and (iii) reasonably acceptable to Owner.

(d) ICA Identification: The identity of the ICA shall be confirmed in a written amendment to the Agreement, executed by Owner and Contractor (CEDG), before issuance of the Notice to Proceed. If Owner cannot identify and retain a qualified ICA within 30 days after contract award to CEDG, Owner may (but is not required to) terminate the award to CEDG for convenience, in which case Owner may re-award the Contract to the next lowest responsive and responsible bidder.

SC-4A.3 References to "Architect."

If CEDG is awarded the Contract as Contractor: (a) all references in the Contract Documents to "Architect" in the context of contract administration shall be deemed to refer to the ICA; (b) all references in the Contract Documents to "Architect" in the context of design or Instruments of Service shall be deemed to refer to CEDG in its capacity as design architect; and (c) CEDG in its capacity as Contractor shall have no authority to make determinations, certifications, or decisions that would otherwise be made by the Architect under the Contract Documents.

SC-4A.4 Bonds and Insurance.

CEDG, if it bids and is awarded the Contract as Contractor, shall be required to furnish the same 100% Performance Bond and 100% Payment Bond required of all other bidders, as set forth in Section SC-11.2. CEDG's status as design architect does not exempt it from any bond or insurance requirement.

SC-4A.5 If CEDG Does Not Bid or Is Not the Successful Bidder.

If CEDG does not submit a bid, or if CEDG submits a bid but is not the successful bidder, CEDG shall continue to serve as Architect and contract administrator under the Contract Documents as provided in Article 4 of the General Conditions and these Supplementary Conditions, without modification.

ARTICLE SC-5 — MODIFICATIONS TO ARTICLE 4 (ARCHITECT)

SC-5.1 Section 4.2.1 is amended by adding the following at the end:

Architect has authority to issue Architect's Supplemental Instructions (AIA G710), Proposal Requests, Change Orders (AIA G701), and Construction Change Directives (AIA G714), subject to the Board-approval threshold established in Section SC-7.2 below. Architect does not have authority to waive any provision of the Contract Documents, to authorize extra work without Owner's prior written approval.

SC-5.2 Section 4.2.6 is amended by adding the following at the end:

Architect's authority to reject Work under this Section 4.2.6 is in addition to, and not in lieu of, Owner's right to stop the Work under Section 2.4 or to terminate the Contract for cause under Section 14.2. Architect's failure to reject nonconforming Work shall not constitute acceptance of such Work or a waiver of Owner's right to require correction.

SC-5.3 Section 4.2.9 is amended by adding the following at the end:

Architect shall issue a Certificate for Payment or written notice of withholding within 7 days of receiving a complete Application for Payment from the Contractor. If Architect determines that any portion of the Application is not properly due, Architect shall issue a Certificate for Payment for the undisputed amount and provide written notice of the basis for withholding the disputed amount, identifying each item withheld and the specific reason for withholding.

ARTICLE SC-6 — MODIFICATIONS TO ARTICLE 5 (SUBCONTRACTORS)

SC-6.1 Section 5.2.1 is amended by adding the following at the end:

All Subcontractors shall hold and maintain valid California contractor's licenses of the appropriate specialty classification for their respective scopes of work (Business and Professions Code § 7058). Contractor shall verify the license status of all proposed Subcontractors before submitting the list of proposed Subcontractors to Owner and Architect, and shall re-verify license status before entering into any subcontract. Contractor shall flow down all applicable Contract Document requirements to all Subcontractors, including insurance, indemnity, warranty, lien

waiver, and safety requirements. If CEDG is awarded the Contract as Contractor, all flow-down requirements applicable to Contractor apply to CEDG in its capacity as Contractor. CEDG's status as design architect does not exempt CEDG from any flow-down obligation.

SC-6.2 Section 5.3 is amended by adding the following at the end:

Contractor is responsible for all acts and omissions of its Subcontractors and sub-subcontractors as if performed by Contractor directly. Contractor shall require each Subcontractor to: (a) maintain insurance in amounts and with endorsements consistent with the requirements applicable to Contractor under the Contract Documents, including naming Owner as an additional insured on a primary and non-contributory basis; (b) provide lien waivers on California statutory forms (Civil Code §§ 8132-8138) as required by the Contract Documents; (c) comply with all safety requirements applicable to the Work, including Cal/OSHA requirements; and (d) provide warranties to Owner as required by the Contract Documents, in Owner's name or transferable to Owner.

ARTICLE SC-7 — MODIFICATIONS TO ARTICLE 7 (CHANGES IN THE WORK)

SC-7.1 Section 7.1 is amended by adding the following new Section 7.1.4:

§ 7.1.4 No-Oral-Changes; No Waiver by Course of Dealing. No change in the Work shall be authorized or effective unless made by written Change Order signed by Owner or Construction Change Directive issued by Owner. Contractor shall not perform any changed or extra work without a written Change Order or Construction Change Directive executed by Owner in advance. Contractor's proceeding with any changed work without a written Change Order or Construction Change Directive shall constitute a waiver of any claim for additional compensation or time arising from such work. Owner's failure to object to any course of dealing, practice, or conduct by Contractor shall not constitute a waiver of Owner's right to require strict compliance with the Contract Documents.

SC-7.2 Section 7.2 is amended by adding the following new Section 7.2.2:

§ 7.2.2 Board Approval Threshold. Change Orders exceeding **$10,000** or that would cause the cumulative total of all Change Orders to exceed ten percent (10%) of the original Contract Sum, require prior written approval of the Owner's Board of Directors before execution. The Architect does not have authority to execute Change Orders exceeding this threshold on behalf of Owner. Where changes are necessary due to emergency conditions that pose an immediate threat to life, safety, or property, and the cumulative total exceeds the threshold above, the Change Order shall be approved by the Owner's authorized representative with subsequent ratification by the Board at its next regularly scheduled meeting; the Contractor shall document the emergency conditions in writing as soon as practicable.

SC-7.3 Section 7.2 is further amended by adding the following new Section 7.2.3:

§ 7.2.3 Change Order Pricing. Change Order pricing shall be determined by one of the following methods, in order of preference: (1) lump sum by mutual agreement, supported by a detailed cost breakdown; (2) unit prices established in the Contract Documents or agreed upon by the parties; or (3) cost plus a markup not to exceed fifteen percent (15%) combined on

Contractor's own direct labor and materials costs, and ten percent (10%) on subcontracted work. No other markups, fees, overhead charges, or other costs shall be allowed beyond those expressly permitted by this Section 7.2.3. Contractor shall submit a detailed cost breakdown and time-impact analysis for any proposed Change Order within ten (10) calendar days of Owner's written request. Failure to submit the required cost breakdown and time-impact analysis within the ten (10) day period shall constitute a waiver of any claim for additional compensation or time arising from the proposed change, unless Owner grants an extension in writing.

SC-7.4 Section 7.3.1 is amended by adding the following at the end:

Contractor shall proceed with Work directed by a Construction Change Directive pending resolution of any pricing dispute. Contractor's failure to proceed with directed Work shall constitute a material breach of the Contract. Contractor's right to dispute the pricing of a Construction Change Directive shall not excuse Contractor from proceeding with the directed Work.

ARTICLE SC-8 — MODIFICATIONS TO ARTICLE 8 (TIME)

SC-8.1 Section 8.1.3 is deleted in its entirety and replaced with the following:

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8. "Substantial Completion" means the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that Owner can occupy or utilize the Work for its intended use, as evidenced by **all** of the following conditions being satisfied: (a) a Certificate of Substantial Completion issued by Architect; (b) a Certificate of Occupancy or equivalent final inspection approval issued by the City of Upland Building Department; and (c) completion of all life-safety systems, including NFPA 13 sprinkler systems, to the satisfaction of the applicable authority having jurisdiction. The Work shall not be deemed Substantially Complete unless and until all three conditions are satisfied. The Architect shall not issue a Certificate of Substantial Completion unless and until all three conditions have been satisfied.

SC-8.2 Section 8.2.1 is amended by adding the following at the end:

Time is of the essence of the Contract. The Contract Time is a material term of the Contract. Contractor acknowledges that Owner will suffer damages if the Work is not Substantially Complete within the Contract Time, and that the liquidated damages specified in the Agreement are a reasonable estimate of Owner's damages for delay and are not a penalty. The Contract Time for Substantial Completion is

SC-8.3 Section 8.3.1 is deleted in its entirety and replaced with the following:

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, or of an employee of either, or of a Separate Contractor employed by the Owner; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending dispute resolution; or (5) by other causes that the

Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine. **As a condition precedent to any extension of the Contract Time or additional compensation for delay**, Contractor shall provide written notice of the delay claim to Owner and Architect within **seven (7) calendar days** after the event giving rise to the delay first becomes apparent to Contractor. Written notice must be accompanied by a written time-impact analysis demonstrating the effect of the delay on the critical path of the construction schedule. Failure to provide timely written notice and time-impact analysis shall constitute a **waiver** of any claim for extension of time or additional compensation for delay, regardless of whether Owner or Architect had actual knowledge of the delay event.

SC-8.4 Section 8.3.3 is deleted in its entirety and replaced with the following:

§ 8.3.3 No Damages for Delay. Except as expressly provided in this Section 8.3.3, Contractor shall have no claim for damages, compensation, or additional payment of any kind for any delay, disruption, hindrance, or interference with the Work, whether caused by Owner, Owner's representatives, Architect, or any other cause, and Contractor's sole remedy for any excusable delay shall be an extension of the Contract Time as provided in Section 8.3.1. This limitation shall not apply to delays caused by: (i) Owner's active interference with the Work (as distinguished from Owner's exercise of its rights under the Contract Documents); (ii) Owner-ordered suspension of the Work for Owner's convenience under Section 14.3 exceeding ninety (90) consecutive days in the aggregate; or (iii) Owner's failure to make timely payment as required by the Contract Documents. Owner's failure to object to any course of dealing shall not constitute a waiver of this no-damages-for-delay provision.

SC-8.5 Section 8.3 is further amended by adding the following new Section 8.3.4:

§ 8.3.4 Liquidated Damages. If the Contractor fails to achieve Substantial Completion within the Contract Time (as the same may be extended by written Change Order), Owner shall be entitled to assess liquidated damages against Contractor in the amount of **$[INSERT]** per calendar day for each calendar day of delay beyond the Contract Time until Substantial Completion is achieved. Liquidated damages shall be deducted from amounts otherwise due Contractor under the Contract Documents. The parties acknowledge that Owner's actual damages for delay would be difficult or impossible to ascertain with certainty, and that the liquidated damages amount is a reasonable estimate of Owner's damages and is not a penalty.

ARTICLE SC-9 — MODIFICATIONS TO ARTICLE 9 (PAYMENTS AND COMPLETION)

SC-9.1 Section 9.2 is amended by adding the following at the end:

Contractor shall submit the Schedule of Values to Architect for approval within twenty (20) calendar days of the date of the Notice to Proceed, organized by CSI MasterFormat division or trade, in sufficient detail to allow meaningful evaluation of each Application for Payment. No Application for Payment shall be processed or certified by Architect, and no payment shall be due from Owner, until the Schedule of Values has been approved in writing by Architect. An unbalanced Schedule of Values will not be acceptable.

SC-9.2 Section 9.3.1 is amended as follows:

Delete the first sentence of Section 9.3.1 and replace with: "Each Application for Payment shall be submitted on AIA Document G702/G703 (Application and Certificate for Payment and Continuation Sheet) or on such other form as Owner may approve in writing. Applications for Payment shall be submitted to Architect no later than the 1st day of each calendar month for Work performed through the last day of the preceding month."

SC-9.3 Section 9.3 is amended by adding the following new Section 9.3.4:

§ 9.3.4 Lien Waiver Requirements. Each Application for Payment shall be accompanied by the following: (a) a Conditional Waiver and Release on Progress Payment (California Civil Code § 8132 statutory form) from Contractor, covering the amount of the current Application for Payment; (b) Conditional Waivers and Releases on Progress Payment (California Civil Code § 8132 statutory form) from each Subcontractor and material supplier who provided labor, materials, or equipment during the period covered by the Application for Payment; (c) Unconditional Waivers and Releases on Progress Payment (California Civil Code § 8134 statutory form) from Contractor and each Subcontractor and material supplier for all prior payment periods for which payment has been received; and (d) such other supporting documentation as Owner or Architect may reasonably require. No Application for Payment shall be certified by Architect or paid by Owner unless and until all required lien waivers and releases have been submitted. Lien waivers not on the California statutory forms prescribed by Civil Code §§ 8132 and 8134 are void and unenforceable under Civil Code § 8122 and will not be accepted.

SC-9.4 Section 9.5.1 is amended by deleting items .1 through .7 and replacing with the following:

The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, because of: (a) defective Work not remedied; (b) third-party claims filed or reasonable evidence indicating probable filing of such claims; (c) mechanic's lien claims, stop payment notices, or payment bond claims filed or threatened against the Project or Owner's property; (d) failure of the Contractor to make payments properly to Subcontractors or material suppliers for labor, materials, or equipment; (e) damage to Owner or another contractor; (f) failure to maintain required insurance or bonds in full force and effect; (g) liquidated damages accrued or accruing due to Contractor's failure to achieve Substantial Completion within the Contract Time; (h) unresolved claims by Owner against Contractor under the Contract Documents; (i) failure to provide required lien releases, lien waivers, or other closeout documents required by Section 9.3.4 or elsewhere in the Contract Documents; (j) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum; or (k) failure to carry out the Work in accordance with the Contract Documents.

SC-9.5 Section 9.6.1 is amended by adding the following at the end:

Owner shall pay undisputed amounts certified by Architect within thirty (30) days of Architect's receipt of the Application for Payment, in compliance with California Civil Code § 8800 (private works prompt payment). If Owner disputes any portion of an Application for Payment, Owner shall notify Contractor in writing within seven (7) days of receipt of the Application, identifying the disputed amount and the specific basis for the dispute, and shall pay the undisputed portion

within the thirty (30) day period. Interest on late payments of undisputed amounts shall accrue at the legal rate under California Civil Code § 8800 from the date payment was due until the date payment is made. Progress payments made after the scheduled completion date shall not constitute a waiver of liquidated damages.

SC-9.6 Section 9.6.2 is amended by adding the following at the end:

Owner shall retain five percent (5%) of each progress payment as retention, in accordance with California Civil Code § 8812. Contractor shall retain the same percentage from each Subcontractor's payment as is retained from Contractor's payment.

SC-9.7 Section 9.7 is amended by adding the following at the end:

Notwithstanding the foregoing, Contractor's right to stop the Work under this Section 9.7 is subject to the dispute resolution and work-continuation provisions of the Contract Documents. Contractor may not stop the Work pending resolution of any payment dispute unless Owner has failed to pay an undisputed amount for more than thirty (30) days after the due date established in Section 9.6.1 and has failed to cure within seven (7) days of written notice from Contractor identifying the specific undisputed amount and the basis for Contractor's assertion that the amount is undisputed. Contractor's right to stop the Work does not apply to disputed amounts.

SC-9.8 Section 9.8.1 is deleted in its entirety and replaced with the following:

§ 9.8.1 Substantial Completion is the stage in the progress of the Work described in Section 8.1.3 of these General Conditions (as modified by Section SC-8.1 of these Supplementary Conditions). The conditions for Substantial Completion include all of the following: (a) a Certificate of Substantial Completion issued by Architect; (b) a Certificate of Occupancy or equivalent final inspection approval issued by the City of Upland Building Department; and (c) completion of all life-safety systems, including NFPA 13 sprinkler systems, to the satisfaction of the applicable authority having jurisdiction. The Work shall not be deemed Substantially Complete unless and until all three conditions are satisfied.

SC-9.9 Section 9.10.2 is amended by adding the following conditions to the list of final payment conditions:

Final payment is conditioned on all of the following: (a) full performance of the Contract by Contractor; (b) Architect's final Certificate for Payment; (c) recordation of Notice of Completion by Owner pursuant to California Civil Code § 8182; (d) Contractor's submission of all of the following to Architect: (i) Unconditional Waiver and Release on Final Payment (California Civil Code § 8138 statutory form) from Contractor and all Subcontractors and material suppliers of every tier; (ii) Consent of Surety to Final Payment (AIA Document G707 or equivalent); (iii) Certificate of Occupancy from the City of Upland Building Department; (iv) operation and maintenance manuals for all equipment and systems installed in the Work; (v) record drawings (as-built drawings) reflecting all changes made during construction, in electronic format (AutoCAD and PDF); (vi) all warranties and guarantees required by the Contract Documents; (vii) keys, access cards, security codes, and other access devices for all systems installed in the Work; (viii) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect; (ix) an affidavit that payrolls, bills for

materials and equipment, and other indebtedness connected with the Work have been paid or otherwise satisfied; and (x) all other closeout documents required by the Contract Documents.

ARTICLE SC-10 — MODIFICATIONS TO ARTICLE 10 (PROTECTION OF PERSONS AND PROPERTY)

SC-10.1 Section 10.1 is amended by adding the following at the end:

Contractor is solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work, in compliance with all applicable federal, state, and local safety laws, regulations, and requirements, including Cal/OSHA requirements (California Code of Regulations, Title 8). Contractor shall designate a qualified safety officer who shall be present at the Project site at all times during the performance of the Work. Owner's exercise of any right to observe or inspect safety conditions shall not create any duty or liability on the part of Owner for safety.

SC-10.2 Section 10.3.1 is amended by adding the following at the end:

For purposes of this Section 10.3, "hazardous material or substance" includes, without limitation, asbestos, asbestos-containing materials (ACM), lead-based paint, polychlorinated biphenyls (PCBs), petroleum hydrocarbons, chlorinated solvents, heavy metals, and any other substance regulated under CERCLA, RCRA, the California Hazardous Waste Control Law (Health & Safety Code § 25100 et seq.), or any other applicable federal, state, or local environmental law.

SC-10.3 Section 10.3 is amended by adding the following new Sections 10.3.7 and 10.3.8:

§ 10.3.7 Environmental Conditions.

§ 10.3.8 Discovery of Hazardous Materials. If Contractor encounters or discovers any material reasonably believed to be a hazardous material or substance not indicated in the Contract Documents, Contractor shall immediately stop Work in the affected area and notify Owner and Architect in writing. Owner shall have the right to stop the Work in the affected area upon discovery of suspected hazardous materials. Owner shall retain a qualified environmental consultant to investigate and remediate any hazardous materials discovered during construction. Contractor shall not resume Work in the affected area until authorized in writing by Owner. Contractor shall be entitled to an equitable adjustment in the Contract Sum and Contract Time for delays caused by Owner-directed hazardous materials remediation, subject to the notice requirements of Section 15.1.3 and the claims procedure of Article 15. Contractor's obligation to stop Work and notify Owner upon discovery of hazardous materials is a condition precedent to any claim for equitable adjustment under this Section 10.3.8.

ARTICLE SC-11 — MODIFICATIONS TO ARTICLE 11 (INSURANCE AND BONDS)

SC-11.1 Section 11.1.1 is deleted in its entirety and replaced with the following:

§ 11.1.1 Contractor shall purchase and maintain, at its sole cost and expense, in a form and content satisfactory to Owner, during the entire term of the Contract including any extension

thereof, the following policies of insurance with insurers admitted to do business in the State of California and rated no less than "A-" VII in the most current edition of A.M. Best's Insurance Reports:

(a) **Commercial General Liability Insurance** (occurrence form), including premises and operations, products and completed operations, personal and advertising injury, and contractual liability coverage, with limits of not less than $2,000,000 per occurrence and $4,000,000 general aggregate. The products and completed operations coverage shall be maintained for a period of not less than three (3) years following Substantial Completion of the Work.

(b) **Commercial Automobile Liability Insurance** covering all owned, non-owned, and hired vehicles, with a combined single limit of not less than $1,000,000 per occurrence.

(c) **Workers' Compensation Insurance** as required by the laws of the State of California (Labor Code § 3700), and **Employer's Liability Insurance** with limits of not less than $1,000,000 per occurrence for bodily injury by accident, $1,000,000 per employee for bodily injury by disease, and $1,000,000 policy limit for bodily injury by disease.

(d) **Umbrella/Excess Liability Insurance** (following form) providing coverage in excess of the Commercial General Liability, Commercial Automobile Liability, and Employer's Liability policies listed above, with limits of not less than $5,000,000 per occurrence and $5,000,000 aggregate.

All policies (except Workers' Compensation) shall name Owner, its officers, directors, agents, and employees as additional insureds on a primary and non-contributory basis, using ISO endorsement CG 20 10 (ongoing operations) and CG 20 37 (completed operations) or equivalent. All policies shall include a waiver of subrogation in favor of Owner. Contractor shall provide Owner with certificates of insurance and **actual endorsements** (not certificates alone) evidencing the required coverage at least ten (10) days prior to commencement of the Work and upon each policy renewal. All policies shall provide for thirty (30) days' prior written notice to Owner of cancellation or material modification (ten (10) days for non-payment of premium).

SC-11.2 Section 11.1.2 is deleted in its entirety and replaced with the following:

§ 11.1.2 Prior to commencement of the Work, Contractor shall furnish to Owner: (a) **Performance Bond:** 100% of the Contract Sum, on AIA Document A312-2010 Performance Bond form (with California rider), executed by a surety company admitted to do business in the State of California and rated no less than "A-" VIII in the most current edition of A.M. Best's Insurance Reports, with power of attorney attached and notarized. (b) **Payment Bond:** 100% of the Contract Sum, on AIA Document A312-2010 Payment Bond form, executed by the same surety as the Performance Bond, for the benefit of Owner and all claimants under California Civil Code § 8600 et seq. (private works payment bond). The Payment Bond shall include stop payment notice beneficiary language as required by California Civil Code § 8600 et seq. Owner shall record the direct contract and the Payment Bond with the San Bernardino County Recorder before commencement of the Work, pursuant to California Civil Code § 8600, to restrict mechanic's lien enforcement and to permit Owner to elect not to withhold after a properly served stop payment notice upon timely notification to the claimant. The bond requirement applies uniformly to all Contractors, including any entity that also serves as the design architect for the Project.

SC-11.3 Section 11.1 is amended by adding the following new Section 11.1.5:

§ 11.1.5 Builder's Risk Insurance.

OPTION A (Owner carries builder's risk): Owner shall purchase and maintain builder's risk insurance on an "all-risk" or "special form" basis, covering the full replacement value of the Work, including materials stored on-site and off-site, with no coinsurance penalty. Owner's builder's risk policy shall name Contractor and Subcontractors as additional insureds.

OPTION B (Contractor carries builder's risk): Contractor shall purchase and maintain builder's risk insurance on an "all-risk" or "special form" basis, covering the full replacement value of the Work, including materials stored on-site and off-site, with no coinsurance penalty. Contractor's builder's risk policy shall name Owner as loss payee and additional insured. If Owner elects Option B, Sections 11.2 and 11.3 must be modified to reflect that Contractor (not Owner) carries builder's risk.

SC-11.4 Section 11.2.1 is amended by adding the following at the end:

Owner's insurance (if any) shall apply in excess of and not contribute with Contractor's insurance. Owner is not required to carry any insurance beyond what is specifically described in the Contract Documents. Owner's failure to carry any particular insurance shall not relieve Contractor of its obligation to carry the insurance required by Section 11.1.

ARTICLE SC-12 — MODIFICATIONS TO ARTICLE 12 (UNCOVERING AND CORRECTION OF WORK)

SC-12.1 Section 12.2.2.1 is amended by adding the following at the end:

If Contractor fails to correct defective Work within a reasonable time after written notice from Owner or Architect, Owner may correct such Work at Contractor's expense, including Owner's reasonable administrative costs and the Architect's additional services fees incurred in connection with the correction. The warranty period for corrected Work shall be extended by the period during which the defect existed, commencing from the date the defect was first discovered by Owner. The one-year correction period does not limit Owner's rights under longer manufacturer or Subcontractor warranties or applicable law, including California Code of Civil Procedure § 337.15 (ten-year statute of repose for latent construction defects). Contractor's warranty and correction obligations shall survive Final Completion and termination of the Contract.

SC-12.2 Section 12.2.2.3 is deleted in its entirety and replaced with the following:

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2, except that the warranty period for any specific item of corrected Work shall be extended by the period during which the defect in that item existed, as provided in Section 12.2.2.1 (as modified by Section SC-12.1 of these Supplementary Conditions).

ARTICLE SC-13 — MODIFICATIONS TO ARTICLE 13 (MISCELLANEOUS PROVISIONS)

SC-13.1 Section 13.1 is deleted in its entirety and replaced with the following:

§ 13.1 This Contract shall be governed by and construed in accordance with the laws of the State of California, without regard to its conflict of laws principles. Any litigation arising out of or related to this Contract that is not subject to arbitration under Section 15.4 shall be brought exclusively in the Superior Court of the State of California, County of San Bernardino, or, if federal jurisdiction exists, in the United States District Court for the Central District of California. Each party hereby consents to the personal jurisdiction of such courts and waives any objection to venue in such courts.

SC-13.2 Section 13.3 is amended by adding the following new Section 13.3.3:

§ 13.3.3 No Waiver by Course of Dealing. Owner's failure to insist upon strict performance of any provision of the Contract Documents, or to exercise any right or remedy available to Owner, shall not constitute a waiver of Owner's right to require strict performance or to exercise such right or remedy in the future. No waiver of any provision of the Contract Documents shall be effective unless in writing and signed by Owner.

SC-13.3 Section 13.7 is deleted in its entirety and replaced with the following:

§ 13.7 As a condition precedent to any recovery, Contractor shall provide written notice of any claim for additional compensation, additional time, or damages within 7 calendar days after the event giving rise to the claim first becomes apparent to Contractor. Written notice must describe the event, the nature of the claim, and Contractor's preliminary estimate of the impact on the Contract Sum and Contract Time. Failure to provide timely written notice constitutes a waiver of the claim. This notice requirement is in addition to, and not in lieu of, any other notice requirements in the Contract Documents. No course of dealing, practice, or conduct by Owner shall waive this notice requirement.

SC-13.4 Section 13 is amended by adding the following new Section 13.8:

§ 13.8 Private Work Disclosure. This Project is a private work of improvement. See Section 8.9 of the Owner-Contractor Agreement (AIA A101-2017, as modified) for the complete Private Work Disclosure. The Contract Documents do not include prevailing wage requirements as operative obligations. Contractor remains solely responsible for determining and complying with all applicable labor, employment, licensing, tax, safety, and wage laws.

ARTICLE SC-14 — MODIFICATIONS TO ARTICLE 14 (TERMINATION OR SUSPENSION)

SC-14.1 Section 14.2.1 is deleted in its entirety and replaced with the following:

§ 14.2.1 The Owner may terminate the Contract if the Contractor: (a) fails to prosecute the Work diligently or persistently refuses or fails to supply enough properly skilled workers or proper materials; (b) fails to correct defective Work as required by Section 12.2; (c) fails to maintain

required insurance or bonds; (d) becomes insolvent, makes a general assignment for the benefit of creditors, or has a receiver appointed; (e) fails to make payments properly to Subcontractors or material suppliers; (f) abandons the Work; (g) persistently disregards applicable laws, ordinances, rules, regulations, or orders of a public authority having jurisdiction; or (h) otherwise materially breaches the Contract and fails to cure within 7 days of written notice from Owner (or such longer period as is reasonably necessary, provided Contractor commences cure within 7 days and diligently pursues it to completion). Upon termination for cause, Owner may take possession of the site and all materials, equipment, tools, and construction equipment thereon and complete the Work by any lawful means. Contractor shall be liable for all costs of completion in excess of the unpaid Contract Sum, plus liquidated damages and other damages.

SC-14.2 Section 14.3 is amended by adding the following at the end:

If Owner suspends the Work for convenience and the aggregate period of suspension exceeds ninety (90) consecutive days, Contractor may terminate the Contract for Owner's convenience under Section 14.4. Contractor is not entitled to additional compensation for a suspension of 90 days or less. Owner shall provide written notice of suspension to Contractor.

SC-14.3 Section 14.4 is amended by adding the following at the end:

Upon termination for convenience, Contractor is entitled to: (a) payment for Work properly performed prior to the effective date of termination; (b) reasonable, documented demobilization costs; and (c) reasonable profit on Work actually performed. Contractor is not entitled to lost profits on unperformed Work, anticipated overhead on unperformed Work, or any other consequential, special, or punitive damages. Such payment constitutes Contractor's sole and exclusive remedy for termination for convenience.

ARTICLE SC-15 — MODIFICATIONS TO ARTICLE 15 (CLAIMS AND DISPUTES)

SC-15.1 Section 15.1.2 is deleted in its entirety and replaced with the following:

§ 15.1.2 Claims by either party must be initiated by written notice to the other party and to the Initial Decision Maker within 7 calendar days after the event giving rise to the claim first becomes apparent to the claimant. Written notice must describe the event, the nature of the claim, and the claimant's preliminary estimate of the impact. Failure to provide timely written notice constitutes a waiver of the claim. Contractor shall not stop or slow the Work pending resolution of any claim or dispute. No course of dealing, practice, or conduct by Owner shall waive the notice requirement.

SC-15.2 Section 15.2.1 is amended by adding the following at the end:

Architect serves as Initial Decision Maker unless the parties mutually agree in writing to appoint another individual. Owner reserves the right to replace the Architect as Initial Decision Maker if Architect's authority is terminated or if Architect has a conflict of interest.

SC-15.3 Section 15.3.1 is deleted in its entirety and replaced with the following:

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4 and 9.10.5, shall be subject to mediation as a condition precedent to binding dispute resolution. All disputes must first be submitted to non-binding mediation under AAA Construction Industry Mediation Procedures before either party may demand binding dispute resolution. Mediation demand must be made within a reasonable time after the dispute arises. If mediation does not resolve the dispute within 60 days of the mediation demand (or such longer period as the parties agree in writing), either party may proceed to binding dispute resolution under Section 15.4.

SC-15.4 Section 15.4.1 is deleted in its entirety and replaced with the following:

§ 15.4.1 DISPUTE RESOLUTION

OPTION A — ARBITRATION: If the parties have selected arbitration as the method of binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration administered by the American Arbitration Association (AAA) under its Construction Industry Arbitration Rules then in effect. The arbitration shall be conducted in San Bernardino County, California. For disputes involving amounts of $[INSERT THRESHOLD] or less, one neutral arbitrator shall be appointed. For disputes involving amounts exceeding $[INSERT THRESHOLD], three neutral arbitrators shall be appointed. The arbitrator's decision shall be final and binding and may be entered as a judgment in any court of competent jurisdiction.

OPTION B — LITIGATION: If the parties have selected litigation as the method of binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be resolved by litigation in the Superior Court of the State of California, County of San Bernardino, or, if federal jurisdiction exists, in the United States District Court for the Central District of California. Each party consents to the personal jurisdiction of such courts and waives any objection to venue.

ATTORNEY FEES: The prevailing party in any arbitration or litigation shall be entitled to recover reasonable attorneys' fees and costs from the non-prevailing party, as determined by the arbitrator or court.

PROJECT MANUAL

Headquarters & Maintenance Buildings

San Antonio Water Company

400 e. 20th Street
Upland, California 91784

ARCHITECT:
Claremont Environmental Design Group, Inc.
480 North Indian Hill Boulevard
Claremont, California 91711
TEL. 909.625.3916 FAX. 909.625.4282
CONTACT: Erik Peterson

June 2026

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Upland, CA 91784

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work with the San Antonio Water Company and their personnel.
4. Access to site.
5. Work restrictions.
6. Specification and drawing conventions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Identification: San Antonio Water Company: New Offices & Operations Yard Facilities

1. Project Location: 20th Street, Upland

B. Owner: San Antonio Water Company
139 N. Euclid Avenue, Upland, CA 91786
Beaumont, CA 92223

1. Owner's Representative: Brian Lee, phone: 909-982-4107.

C. Architect: CEDG, Erik Peterson, 909-973-7282

D. Contractor: TBD

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Construction of a new 3,887 s.f. Main Office Building. Occupancy: B, Type of Construction: VB, Sprinklered per NFPA 13 and new 4,100 s.f. Maintenance/Storage Building, Occupancy S-2/U, Sprinklered per NFPA 13. The structures consist of a slab on grade, dimensional lumber walls and dimensional lumber and TJI framing from loft floor and roof frame.

B. Type of Contract.

1. Project will be constructed under a single prime contract.

Note: As part of the prime contract with the Owner, the selected prime contractor shall provide all electrical power, piping, plumbing to (and from) the above equipment. Contractor shall also provide all foundations and other structure to support and anchor the above equipment as part of the prime contract with the Owner.

a. The selected prime contractor shall coordinate with the San Antonio Water Company to facilitate the installation of San Antonio Water Company furnished and installed equipment, fixtures and furniture at the appropriate time:

i. Communications Cabling and Antennas
ii. Photocopier
iii. TV’s
iv. Desks and Desk Chairs
v. Modular Furniture
vi. File Cabinets

Note: The prime contractor shall provide all electrical power, data and communications conduits to and from the above equipment. Contractor shall also provide all foundations and other structure to support and anchor the above equipment as part of the prime contract with the Owner.

b. Cooperate fully with San Antonio Water Company personnel so work may be carried out smoothly, without interfering with or delaying work under this Contract.

1.4 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during the construction period. Construction Access to and from the site shall be limited to the north east corner of the site and entered from the corner of 20th Street and Campus Drive. Offsite work will be required to create a construction access road, that will later become the permanent driveway access for the project. from 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.

1.5 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours as codified by the City of Upland.

C. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes.

1.6 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. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. 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 published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 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 AIA Document G710, "Architect's Supplemental Instructions" or forms acceptable to the Owner.

1.3 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 Construction Manager are not instructions either to stop work in progress or to execute the proposed change.

2. Within time specified in Proposal Request or 10 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 or forms acceptable to Architect and Owner.

B. Contractor-Initiated Work Change 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 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Work Change Proposal Request Form: Use form provided by Owner or form acceptable to Architect and Owner.

1.4 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

1.5 CHANGE ORDER PROCEDURES

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

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Work Change Directive: Architect may issue a Work Change Directive on AIA Document G714 or forms acceptable to the Owner. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Application for Payment forms with Continuation Sheets Submittals Schedule and 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: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

B. Format and Content: Use the 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. Name of Architect.
    c. Architect's project number.
    d. Contractor's name and address.
    e. Date of submittal.

2. Submit draft of AIA Document G703 Continuation Sheets or forms acceptable to the Owner.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training in the amount of 5 percent of the Contract Sum.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
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.
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. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Progress payments shall be submitted to Architect by the fifthteenth day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

D. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment or those forms acceptable to the Owner.

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 of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

F. Transmittal: Submit 3 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.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is 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 final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

H. 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. Schedule of unit prices.
5. Submittals Schedule (preliminary if not final).
6. List of Contractor's staff assignments.
7. List of Contractor's principal consultants.
8. Copies of building permits.
9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
10. Initial progress report.
11. Report of preconstruction conference.
12. Certificates of insurance and insurance policies.

I. Application for Payment at Substantial Completion: After issuing 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.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: 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. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.

4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims" or forms acceptable to Owner.
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens" or forms acceptable to Owner.
6. AIA Document G707, "Consent of Surety to Final Payment" or forms acceptable to Owner.
7. Evidence that claims have been settled.
8. 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.
9. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Coordination drawings.
2. Requests for Information (RFIs).
3. Project meetings.

B. Related Requirements:

1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 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, and telephone number 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.

1.4 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 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.

1.5 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, where installation is not completely shown 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. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

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.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
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. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility.

1.6 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. RFI Forms: AIA Document G716 or forms acceptable to Owner.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five 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.

1. The following RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.

c. Requests for coordination information already indicated in the Contract Documents.
d. Requests for adjustments in the Contract Time or the Contract Sum.
e. Requests for interpretation of Architect's actions on submittals.
f. 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 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 012600 "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 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 biweekly. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.

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 within seven days if Contractor disagrees with response.

1.7 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.
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: 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, 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. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    e. Procedures for processing field decisions and Change Orders.
    f. Procedures for RFIs.
    g. Procedures for testing and inspecting.
    h. Procedures for processing Applications for Payment.
    i. Distribution of the Contract Documents.
    j. Submittal procedures.

    k. Preparation of record documents.
    l. Use of the premises.
    m. Work restrictions.
    n. Working hours.
    o. Owner's occupancy requirements.
    p. Responsibility for temporary facilities and controls.
    q. Procedures for moisture and mold control.
    r. Procedures for disruptions and shutdowns.
    s. Construction waste management and recycling.
    t. Parking availability.
    u. Office, work, and storage areas.
    v. Equipment deliveries and priorities.
    w. First aid.
    x. Security.
    y. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, and Owner's Commissioning Authority (as needed) of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

    a. Contract Documents.
    b. Options.
    c. Related RFIs.
    d. Related Change Orders.
    e. Purchases.
    f. Deliveries.

g. Submittals.

h. Review of mockups.
i. Possible conflicts.
j. Compatibility problems.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written instructions.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

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.

D. Progress Meetings: Conduct progress meetings at biweekly or as needed.

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 meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. 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) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Progress cleaning.
10) Quality and work standards.
11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.
14) Status of proposal requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

3. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - 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. Contractor's construction schedule.
2. Construction schedule updating reports.
3. Daily construction reports.
4. Site condition reports.

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. 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 when activities can be performed and the critical path of Project.

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

D. 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.

1.3 INFORMATIONAL SUBMITTALS

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

1. Working electronic copy of schedule file, where indicated.

2. PDF electronic file.

B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

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

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, 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 all 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 all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from commencement of the Work 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. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate Contractor's construction schedule with the schedule of values, 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.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for commencement of the Work to date of Substantial Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story 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 30 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for long lead 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.

3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
5. 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.
6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

C. 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 Restrictions: Show the effect of the following items on the schedule if applicable:
   a. Seasonal variations.
   b. Environmental control.

3.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to Substantial Completion, and final completion and interim milestones as requested by the Owner at the pre-construction meeting.

E. 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 Contract Time.

F. 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.

G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 20 days of date established for commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. Startup Network Diagram: Submit diagram within 14 days of date established for commencement of the Work. 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 **30** days after date established for commencement of the Work.

a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.

2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

3. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order 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. Delivery.
d. Fabrication.
e. Installation.

f. Testing and commissioning.
g. Punch list and final completion.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall 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.

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.

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.

2.4 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. Approximate count of personnel at Project site.

3. Equipment at Project site.
4. Material deliveries.
5. High and low temperatures and general weather conditions, including presence of rain or snow.
6. Accidents.
7. Meetings and significant decisions.
8. Unusual events.
9. Stoppages, delays, shortages, and losses.
10. Emergency procedures.
11. Orders and requests of authorities having jurisdiction.
12. Change Orders received and implemented.
13. Work Change Directives received and implemented.
14. Services connected and disconnected.
15. Equipment or system tests and startups.
16. Partial completions and occupancies.
17. Substantial Completions authorized.

B. 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.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. 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.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, 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.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
2. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.

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.

1.3 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule 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.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. 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. Coordinate transmittal of different types of submittals for related parts of the Work 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.

B. 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 10 days for review of each resubmittal.

C. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner**,** containing the following information:

a. Project name.
b. Date.
c. Name and address of Architect.
d. Name of Construction Manager.
e. Name of Contractor.
f. Name of firm or entity that prepared submittal.
g. Names of subcontractor, manufacturer, and supplier.
h. Category and type of submittal.
i. Submittal purpose and description.
j. Specification Section number and title.
k. Specification paragraph number or drawing designation and generic name for each of multiple items.
l. Drawing number and detail references, as appropriate.
m. Location(s) where product is to be installed, as appropriate.
n. Related physical samples submitted directly.
o. Indication of full or partial submittal.
p. Transmittal number.
q. Submittal and transmittal distribution record.
r. Other necessary identification.
s. Remarks.

D. Options: Identify options requiring selection by Architect.

E. Deviations: Identify deviations from the Contract Documents on submittals.

F. 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.

G. 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.

H. 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.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements:

1. Submit electronic submittals via email as PDF electronic files.

a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Action Submittals: Submit five paper copies of each submittal unless otherwise indicated. Architect will return two copies.
3. Informational Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will not return copies.
4. Certificates and Certifications Submittals: Provide 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.

B. 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 not suitable 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 showing 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 or concurrent with Samples.

6. Submit Product Data in the following format:

a. PDF electronic file.
b. Three paper copies of Product Data unless otherwise indicated. Architect will return two copies.

C. 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.

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. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.

3. Submit Shop Drawings in the following format:

a. PDF electronic file.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
4. 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 not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. 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.

6. 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.

        1) 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.

E. 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. Submit product schedule in the following format:

    a. PDF electronic file.

F. Coordination Drawings Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."

G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."

H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures.

I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."

J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

M. 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.

N. 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.

O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

Q. 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.

R. 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.

S. 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.

T. Schedule of Tests and Inspections: Comply with requirements specified in Section 014000 "Quality Requirements."

U. 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.

V. 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 primers and substrate preparation needed for adhesion.

W. 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.

X. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action 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. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, 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.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

C. 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.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting 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. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
3. Specific test and inspection requirements are not specified in this Section.

1.2 DEFINITIONS

A. 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.

B. 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

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

D. 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.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. 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, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

1.3 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be 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.

1.4 INFORMATIONAL SUBMITTALS

A. 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.

1.5 REPORTS AND DOCUMENTS

A. Permits, Licenses, and Certificates: For Owner's records, 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.

1.6 QUALITY ASSURANCE

A. General: 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.

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, 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 are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329 and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's 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. 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 responsibilities include the following:

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. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
d. When testing is complete, remove test specimens, assemblies, and mockups**,** do not reuse products on Project unless authorized by the Owner.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect 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.

J. 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 in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.

    a. Allow seven days for initial review and each re-review of each mockup.

5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

6. Demolish and remove mockups when directed unless otherwise indicated.

K. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Specification Sections.

1.7 QUALITY CONTROL

A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.

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 and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location 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 any duties of Contractor.

E. Associated Services: Cooperate with agencies 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 inspecting. 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 inspecting equipment at Project site.

F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.8 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Conducted by a qualified testing agency and/or special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections.

PART 2 - EXECUTION

2.1 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.

2.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, 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 017300 "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 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "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.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "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."

E. "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.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "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.

1.2 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.

1.3 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.

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

41. AWS - American Welding Society; www.aws.org.
42. AWWA - American Water Works Association; www.awwa.org.
43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.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 and 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; (See ECIA).
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
73. ECIA - Electronic Components Industry Association; www.eciaonline.org.
74. EIA - Electronic Industries Alliance; (See TIA).
75. EIMA - EIFS Industry Members Association; www.eima.com.
76. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
77. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
78. ESTA - Entertainment Services and Technology Association; (See PLASA).
79. EVO - Efficiency Valuation Organization; www.evo-world.org.
80. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
81. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
82. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
83. FM Approvals - FM Approvals LLC; www.fmglobal.com.
84. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
85. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridaroof.com.

86. FSA - Fluid Sealing Association; www.fluidsealing.com.
87. FSC - Forest Stewardship Council U.S.; www.fscus.org.
88. GA - Gypsum Association; www.gypsum.org.
89. GANA - Glass Association of North America; www.glasswebsite.com.
90. GS - Green Seal; www.greenseal.org.
91. HI - Hydraulic Institute; www.pumps.org.
92. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
93. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
94. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
95. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
96. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
97. IAS - International Accreditation Service; www.iasonline.org.
98. IAS - International Approval Services; (See CSA).
99. ICBO - International Conference of Building Officials; (See ICC).
100. ICC - International Code Council; www.iccsafe.org.
101. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
102. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
103. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
104. IEC - International Electrotechnical Commission; www.iec.ch.
105. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
106. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
107. IESNA - Illuminating Engineering Society of North America; (See IES).
108. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
109. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
110. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
111. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
112. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
113. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
114. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
115. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
116. ISO - International Organization for Standardization; www.iso.org.
117. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
118. ITU - International Telecommunication Union; www.itu.int/home.
119. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
120. LMA - Laminating Materials Association; (See CPA).
121. LPI - Lightning Protection Institute; www.lightning.org.
122. MBMA - Metal Building Manufacturers Association; www.mbma.com.
123. MCA - Metal Construction Association; www.metalconstruction.org.
124. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
125. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
126. MHIA - Material Handling Industry of America; www.mhia.org.
127. MIA - Marble Institute of America; www.marble-institute.com.
128. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
129. MPI - Master Painters Institute; www.paintinfo.com.
130. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.

131. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
132. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
133. NADCA - National Air Duct Cleaners Association; www.nadca.com.
134. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
135. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
136. NBI - New Buildings Institute; www.newbuildings.org.
137. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
138. NCMA - National Concrete Masonry Association; www.ncma.org.
139. NEBB - National Environmental Balancing Bureau; www.nebb.org.
140. NECA - National Electrical Contractors Association; www.necanet.org.
141. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
142. NEMA - National Electrical Manufacturers Association; www.nema.org.
143. NETA - InterNational Electrical Testing Association; www.netaworld.org.
144. NFHS - National Federation of State High School Associations; www.nfhs.org.
145. NFPA - National Fire Protection Association; www.nfpa.org.
146. NFPA - NFPA International; (See NFPA).
147. NFRC - National Fenestration Rating Council; www.nfrc.org.
148. NHLA - National Hardwood Lumber Association; www.nhla.com.
149. NLGA - National Lumber Grades Authority; www.nlga.org.
150. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
151. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
152. NRCA - National Roofing Contractors Association; www.nrca.net.
153. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
154. NSF - NSF International; www.nsf.org.
155. NSPE - National Society of Professional Engineers; www.nspe.org.
156. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
157. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
158. NWFA - National Wood Flooring Association; www.nwfa.org.
159. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
160. PDI - Plumbing & Drainage Institute; www.pdionline.org.
161. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
162. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
163. RFCI - Resilient Floor Covering Institute; www.rfci.com.
164. RIS - Redwood Inspection Service; www.redwoodinspection.com.
165. SAE - SAE International; www.sae.org.
166. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
167. SDI - Steel Deck Institute; www.sdi.org.
168. SDI - Steel Door Institute; www.steeldoor.org.
169. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
170. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
171. SIA - Security Industry Association; www.siaonline.org.
172. SJI - Steel Joist Institute; www.steeljoist.org.
173. SMA - Screen Manufacturers Association; www.smainfo.org.
174. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
175. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
176. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.

177. SPIB - Southern Pine Inspection Bureau; www.spib.org.
178. SPRI - Single Ply Roofing Industry; www.spri.org.
179. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
180. SSINA - Specialty Steel Industry of North America; www.ssina.com.
181. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
182. STI - Steel Tank Institute; www.steeltank.com.
183. SWI - Steel Window Institute; www.steelwindows.com.
184. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
185. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
186. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
187. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
188. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
189. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
190. TMS - The Masonry Society; www.masonrysociety.org.
191. TPI - Truss Plate Institute; www.tpinst.org.
192. TPI - Turfgrass Producers International; www.turfgrasssod.org.
193. TRI - Tile Roofing Institute; www.tileroofing.org.
194. UL - Underwriters Laboratories Inc.; www.ul.com.
195. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
196. USAV - USA Volleyball; www.usavolleyball.org.
197. USGBC - U.S. Green Building Council; www.usgbc.org.
198. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
199. WASTEC - Waste Equipment Technology Association; www.wastec.org.
200. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
201. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
202. WDMA - Window & Door Manufacturers Association; www.wdma.com.
203. WI - Woodwork Institute; www.wicnet.org.
204. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
205. WWPA - 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.

1. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
2. ICC - International Code Council; www.iccsafe.org.
3. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

D. 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.

E. 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.

1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance 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.
7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestservice.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.2 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, Architect, testing agencies, and authorities having jurisdiction.

1.3 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.4 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.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use existing site walls as much as possible until such time as portions must be removed to carry out the Work.

B. 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.

2.2 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.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations as needed and as determined by the Owner.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.

2. 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 017700 "Closeout Procedures".

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. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

C. 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.

D. 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.

E. 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.

F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

G. 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.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. 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.

2. Provide dust-control as required.

B. 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.

C. Parking: Provide temporary parking areas for construction personnel.

D. Storm water removal: 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.

E. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

    a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touchup signs so they are legible at all times.

F. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

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.

C. Temporary Erosion and Sedimentation Control: Comply with the drawings.

D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.

E. 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.

F. Site Enclosure Fence: 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.

2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

G. 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.

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 materials from water damage and keep porous and organic materials from coming into prolonged contact with concrete.

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. Discard or replace water-damaged and wet material.
4. Discard, replace, or clean stored or installed material that begins to grow mold.
5. 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. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 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.

C. 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. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 017700 - 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. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
2. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
3. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

1.2 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 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, final completion construction photographic documentation, 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 where applicable.
5. Submit test/adjust/balance records.
6. 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 017900 "Demonstration and Training."
6. Advise Owner of changeover in heat and other utilities.
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, including touchup painting.
10. Touch up 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. Reinspection: 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.

1.6 FINAL COMPLETION PROCEDURES

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "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 shall 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. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection to determine acceptance. 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

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 items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Retain subparagraph below and paper copy documents if required by Owner. Indexing requirement below can be performed automatically using PDF publishing software.
   1. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

C. 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 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, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, 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 neither planted nor 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. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.

l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
p. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

    a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation manuals for systems, subsystems, and equipment.
2. Product maintenance manuals.
3. Systems and equipment maintenance manuals.

1.2 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 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.

C. 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 will return copy with comments.

1. Correct or revise to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR OPERATION, AND MAINTENANCE MANUALS

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.

B. 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.

C. 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 Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

D. 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.

E. 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.

F. 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.

2.2 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 is 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.

2.3 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.

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. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.4 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.

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.

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. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. 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.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. 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.

D. 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.

E. 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.

F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS.

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Product Data.

B. Related Requirements:

1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up record prints.
2. Number of Copies: Submit copies of record Drawings as follows:

a. Initial Submittal:

1) Submit PDF electronic files of scanned record prints and one sets 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 two sets of prints.
2) Print each drawing, whether or not changes and additional information were recorded.

B. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 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. Record data as soon as possible after obtaining it.
    c. Record and check the markup before enclosing concealed installations.

2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. 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: Annotated PDF electronic file with comment function enabled.
2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
3. Refer instances of uncertainty to Architect for resolution.
4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.

C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect.
    e. Name of Contractor.

D. 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 and record Drawings where applicable.

E. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.

2.2 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 scanned PDF electronic file(s) of marked-up miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples 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.

END OF SECTION 017839

SECTION 017900 - 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. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.

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.

1.3 CLOSEOUT SUBMITTALS

1. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.

1.4 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

B. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training.

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 content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 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. Operating standards.
    c. Regulatory requirements.
    d. Equipment function.
    e. Operating characteristics.
    f. Limiting conditions.

2. Documentation: Review the following items in detail:

    a. Emergency manuals.
    b. Operations manuals.
    c. Maintenance manuals.
    d. Project record documents.
    e. Warranties and bonds.
    f. 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.

PART 3 - EXECUTION

3.1 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 017823 "Operation and Maintenance Data."

3.2 INSTRUCTION

A. 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 with at least 20 days' advance notice.

B. 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.

END OF SECTION 017900

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Design Mixtures: For each concrete mixture.

C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement.

1.3 INFORMATIONAL SUBMITTALS

A. Material certificates.

B. Material test reports.

C. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M - 09 requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1.5 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.6 FIELD CONDITIONS

A. Hot-Weather Placement: Comply with ACI 301.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301.
2. ACI 117.

2.2 FORM-FACING MATERIALS

A. 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.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

C. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

D. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

E. 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."

2.4 CONCRETE MATERIALS

A. Cementitious Materials:

1. Portland Cement: ASTM C 150/C 150M, Type I/II gray.

B. Normal-Weight Aggregates: ASTM C 33/C 33M, graded.

1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.

C. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do 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.

D. Water: ASTM C 94/C 94M and potable.

2.5 VAPOR RETARDERS

A. Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Curing and sealing compounds shall comply with the testing and product requirements of 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."

F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. Curing and sealing compounds shall comply with the testing and product requirements of 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."

2.7 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

2.8 CONCRETE MIXTURES, GENERAL

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.

B. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use 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, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.

2.9 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Normal-Weight Concrete:

1. Minimum Compressive Strength: As indicated in the drawings at 28 days.
2. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.10 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

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. Chamfer exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEM INSTALLATION

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-RETARDER INSTALLATION

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 12 inches (150 mm) and seal with manufacturer's recommended tape.

3.4 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

C. 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 does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.

B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is 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. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.

1. Apply scratch finish to surfaces to receive mortar setting beds for bonded cementitious floor finishes.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view.
2. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft. long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch (6 mm).

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.9 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 lb/sq. ft. x 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 remainder of curing period.

D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
3. Curing 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. Maintain continuity of coating and repair damage during curing period.

    a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a 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.

3.10 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.11 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.

END OF SECTION 033000

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units for trash enclosure walls.

2. Concrete masonry units for site retaining walls

B. See Division 07 Section "Sheet Metal Flashing and Trim" for furnishing manufactured reglets installed in masonry joints for metal flashing.

1.2 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For reinforcing steel. Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.

C. Samples for Verification: For each type and color of exposed masonry unit and colored mortar.

D. Samples for Verification: Wall Caps (10” width).

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of product. For masonry units, include material test reports substantiating compliance with requirements.

B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.5 QUALITY ASSURANCE

A. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.

1. Build sample panels for each type of exposed unit masonry construction in sizes approximately 60 inches long by 48 inches high by full thickness.

1.6 FIELD CONDITIONS

A. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

2. Products:

.

a. ORCO Block Company or approved equal

B. Concrete Masonry Units: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi (14.8 MPa).
2. Density Classification: Normal weight.

2.3 MORTAR AND GROUT MATERIALS

A. Regional Materials: Aggregate for mortar and grout shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

C. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.

D. Colored Cement Products: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Colored Portland Cement-Lime Mix:

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) Lehigh Cement Company.

2. Colored Masonry Cement:

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) Lehigh Cement Company.

E. Aggregate for Mortar: ASTM C 144.

1. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

F. Aggregate for Grout: ASTM C 404.

G. Water: Potable.

2.4 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 .

2.5 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).

2.6 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. 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:

    a. Diedrich Technologies, Inc.; a division of Sandell Construction Solutions.
    b. PROSOCO, Inc.

2.7 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. For reinforced masonry, use portland cement-lime.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270 Proportion Specification.

1. For masonry below grade or in contact with earth, use Type S.
2. For reinforced masonry, use Type S.
3. For mortar parge coats, use Type S.
4. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.

D. Grout for Unit Masonry: Comply with ASTM C 476

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143/C 143M.

E. Epoxy Pointing Mortar: Mix epoxy pointing mortar to comply with mortar manufacturer's written instructions.

1. Application: Use epoxy pointing mortar for exposed mortar joints with the following units:

a. Pre-faced CMUs.
b. Glazed structural clay facing tile.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. 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.

B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

C. Comply with 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 (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.

3.2 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
2. 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 (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
4. 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 (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).

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 (100-mm) horizontal face dimensions at corners or jambs.

C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

E. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

A. Lay CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.

4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Lay structural clay tile as follows:

1. Lay vertical-cell units with full head joints unless otherwise indicated. Provide bed joints with full mortar coverage on face shells and webs.
2. Lay horizontal-cell units with full bed joints unless otherwise indicated. Keep drainage channels, if any, free of mortar. Form head joints with sufficient mortar so excess will be squeezed out as units are placed in position. Butter both sides of units to be placed, or butter one side of unit already in place and one side of unit to be placed.
3. Maintain joint thicknesses indicated except for minor variations required to maintain bond alignment. If not indicated, lay walls with 1/4- to 3/8-inch- (6- to 10-mm-) thick joints.

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

E. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.5 COMPOSITE MASONRY

A. Corners: Provide interlocking masonry unit bond in each wythe and course at corners unless otherwise indicated.

B. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together.

3.6 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

3.7 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace,

tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

C. 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 TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches.

3.8 REPAIRING, POINTING, AND CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

B. 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.
3. Protect adjacent surfaces from contact with cleaner.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.9 MASONRY WASTE DISPOSAL

A. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

END OF SECTION 042000

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural steel for Storage Building and Trash Enclosure
2. Grout.

1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication of structural-steel components.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, fabricator, testing agency.

B. Welding certificates.

C. Mill test reports for structural steel, including chemical and physical properties.

D. Source quality-control reports.

E. Field quality-control and special inspection reports.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 360.
3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated.

2.2 STRUCTURAL-STEEL MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. See Structural Drawings for all grades and material types and specifications.

2.3 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 490,Type 1, heavy-hex steel structural bolts ASTM A 563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers with plain finish.

1. Finish: Plain.

B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy hex head steel structural bolts with splined ends; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

1. Finish: Plain

C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

D. Unheaded Anchor Rods: ASTM F 1554, Grade 36

1. Configuration: Straight.
2. Finish: Plain

E. Headed Anchor Rods: ASTM F 1554, Grade 36 straight.

1. Finish: Plain.

F. Threaded Rods: ASTM A 36/A 36M

1. Finish: Plain

2.4 PRIMER

A. Primer: SSPC-Paint 25, Type II, iron oxide, zinc oxide, raw linseed oil, and alkyd.

B. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.5 GROUT

A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.

B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

B. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

2.7 SHOP CONNECTIONS

A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.8 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
2. Surfaces to be field welded.
3. Surfaces of high-strength bolted, slip-critical connections.

4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces.
6. Surfaces enclosed in interior construction.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Baseplates, Bearing Plates and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

D. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

END OF SECTION 051200

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous steel framing and supports.
2. Shelf angles.
3. Metal ladders.
4. Steel Saddles and Plates for Site Built Wood Trusses and Wood Beams.
5. Structural-steel door frames.
6. Miscellaneous steel trim.
7. Metal bollards.
8. Metal corner guards.
9. Handrails other than pipe or tube railings (all exterior handrails and accessories to be galvanized steel).
10. Metal Gates (vehicle and man and accessories to be galvanized steel)
11. Bike Rack

B. Products furnished, but not installed, under this Section include the following:
1. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

1.2 ACTION SUBMITTALS

A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

C. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

D. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

E. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

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 B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless-steel fasteners for fastening aluminum.
2. Provide stainless-steel fasteners for fastening stainless steel.
3. Provide stainless-steel fasteners for fastening nickel silver.
4. Provide bronze fasteners for fastening bronze.

B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

2.4 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
b. Carboline Company; Carbozinc 621.
c. ICI Devoe Coatings; Catha-Coat 313.
d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.
e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 2500 psi.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.

C. 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.

D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.

E. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c.

G. Bicycle Racks: Fabricate from Schedule 40 steel pipe, fully welded together.

1. See Section 129300.

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.

C. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.

1. Where wood nailers are attached to girders with bolts or lag screws, drill or punch holes at 24 inches (600 mm) o.c.

D. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and

connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise 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.

B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.

C. Galvanize shelf angles located in exterior walls.

D. Prime shelf angles located in exterior walls with zinc-rich primer.

E. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.8 METAL LADDERS

A. General:

1. Comply with ANSI A14.3.
2. For elevator pit ladders, comply with ASME A17.1/CSA B44.

B. Steel Ladders:

1. Space siderails 18 inches (457 mm) apart unless otherwise indicated.
2. Siderails: Continuous, 3/8-by-2-1/2-inch (9.5-by-64-mm) steel flat bars, with eased edges.
3. Rungs: 3/4-inch- (19-mm-) diameter steel bars.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung.
6. Galvanize ladders, including brackets.
7. Prime ladders, including brackets and fasteners, with zinc-rich primer.

2.9 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

C. Galvanize exterior miscellaneous steel trim. Decorative “Iron” Window Grills

2.10 METAL BOLLARDS

A. Fabricate metal bollards from 1/4-inch (6.4-mm) wall-thickness rectangular steel tubing & steel shapes, as indicated.

B. Prime bollards with zinc-rich primer.

2.11 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

2.12 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.13 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

2.14 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

B. 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 universal shop primer.

C. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:

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 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Items: SSPC-SP 3, "Power Tool Cleaning."

D. 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.

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.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING METAL BOLLARDS

A. Fill bollards solidly with concrete, mounding top surface to shed water.

3.3 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Framing with engineered wood products.
3. Shear wall panels.
4. Rooftop equipment bases and support curbs.
5. Wood blocking, cants, and nailers.
6. Wood furring and grounds.
7. Wood sleepers.
8. Plywood backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

A. 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.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Engineered wood products.
3. Shear panels.
4. Power-driven fasteners.
5. Post-installed anchors.
6. Metal framing anchors.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Regional Materials: The following wood materials shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site:

1. Dimension lumber.

2. Laminated-veneer lumber.
3. Rim boards.

B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber 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. Dress lumber, S4S, unless otherwise indicated.

C. 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, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that 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.

D. Application: Treat items indicated on Drawings, and the following:
1. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
2. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: No. 2 and Stud grade.

1. Application: All interior partitions.
2. Species:
   a. Western woods; WCLIB or WWPA.

B. Framing Other Than Non-Load-Bearing Partitions: No. 2 or better and Stud grade unless noted otherwise in the Drawings.

1. Species:
   a. Douglas fir-larch; WCLIB or WWPA.
   b. Douglas fir-south; WWPA.

C. Framing Other Than Non-Load-Bearing Partitions: See Structural Drawings for minimum modulus of elasticity.

D. Exposed Framing: Hand-select material 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 construction of same type.

2.4 ENGINEERED WOOD PRODUCTS

A. Engineered Wood Products, General: Products shall contain no urea formaldehyde.

B. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.

1. 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:

   a. Boise Cascade Corporation.
   b. Georgia-Pacific Building Products.
   c. Louisiana-Pacific Corporation.
   d. Pacific Woodtech Corporation.

2. Extreme Fiber Stress in Bending, Edgewise: See Structural Drawings.

3. Modulus of Elasticity, Edgewise: See Structural Drawings

2.5 SHEAR WALL PANELS

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. Simpson Strong-Tie Co., Inc.

B. Wood-Framed Shear Wall Panels: Prefabricated assembly consisting of wood perimeter framing, tie downs, and Exposure I, Structural I plywood or OSB sheathing.

1. Products shall contain no urea formaldehyde.

C. Steel-Framed Shear Wall Panels: Prefabricated assembly consisting of cold-formed galvanized-steel panel, steel top and bottom plates, and wood studs.

D. Allowable design loads, as published by manufacturer, shall 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.

2.6 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.

B. Dimension Lumber Items: No. 2 and Stud grade lumber of any species.

C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
1. Western woods; No. 2 Common grade; WCLIB or WWPA.

2.7 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.8 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall 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 hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

C. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193 or ICC-ES AC308 as appropriate for the substrate.

2.9 METAL FRAMING ANCHORS

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. Simpson Strong-Tie Co., Inc.

B. Allowable design loads, as published by manufacturer, shall 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. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

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

1. Use for interior locations unless otherwise indicated.

D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A, or high-strength low-alloy steel Type B ;G185 coating designation; and not less than 0.036 inch (0.9 mm) thick.

1. Use for wood-preservative-treated lumber and where indicated.

2.10 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spun bonded polyolefin to produce an overall thickness of not less than 0.025 inch.

C. Adhesives for Gluing Furring to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

1. Adhesives shall have a VOC content of 70 g/L or less.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

D. Install shear wall panels to comply with manufacturer's written instructions

E. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

F. Do not splice structural members between supports unless otherwise indicated.

G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

I. 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 (IBC).
2. ICC-ES evaluation report for fastener.

3.2 PROTECTION

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

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Parapet sheathing.
4. Sheathing joint and penetration treatment.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

PART 2 - PRODUCTS

2.1 WALL SHEATHING

A. Plywood Sheathing: Exterior, Exposure 1, Structural I sheathing.

B. Oriented-Strand-Board Sheathing: DOC PS 2, Exposure 1, Structural I sheathing.

2.2 ROOF SHEATHING

A. Oriented-Strand-Board Radiant Barrier Roof Sheathing: LP TechShield Radiant Barrier Sheathing: 19/32”.

2.3 PARAPET SHEATHING

A. Plywood Sheathing: Exposure 1, Structural I, Exposure 1 sheathing.sheathing.

B. Oriented-Strand-Board Sheathing: DOC PS 2, Exposure 1, Structural I, Exposure 1 sheathing.sheathing.

2.4 SUBFLOORING AND UNDERLAYMENT

A. Plywood Subflooring: Exposure 1, Structural I single-floor panels or sheathing.

B. Oriented-Strand-Board Subflooring: DOC PS 2, Exposure 1**,** Structural I sheathing.

2.5 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

2.6 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Adhesives shall have a VOC content of 50 g/L or less.

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. Arrange joints so that pieces do not span between fewer than three support members.

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. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

D. Coordinate wall, parapet 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.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Subflooring:

a. Glue and nail to wood framing.
b. Space panels 1/8 inch (3 mm) apart at edges and ends.

2. Wall and Roof Sheathing:

a. Nail to wood framing.

b. Space panels 1/8 inch (3 mm) apart at edges and ends.

END OF SECTION 061600

SECTION 061800 - GLUED-LAMINATED CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes framing using structural glued-laminated timber.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 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-EWS trademark. Place mark on surfaces that will not be exposed in the completed Work.

B. Quality Standard: Comply with AITC A190.1.

1.4 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with provisions in AITC 111.

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 AITC 117 or research/evaluation reports acceptable to authorities having jurisdiction.
1. Provide structural glued-laminated timber made with wet-use adhesive complying with ASTM D 2559.

B. Species and Grades for Structural Glued-Laminated Timber: Douglas fir-larch that complies with structural properties indicated.

C. Species and Grades for Columns:

1. Species and Combination Symbol: Douglas fir-larch.

D. Appearance Grade: Architectural, complying with AITC 110.

E. 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.

F. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.

2.2 TIMBER CONNECTORS

A. General: Unless otherwise indicated, fabricate from the following materials:

1. Structural-steel shapes, plates, and flat bars complying with ASTM A 36/A 36M.
2. Round steel bars complying with ASTM A 575, Grade M 1020.
3. Hot-rolled steel sheet complying with ASTM A 1011/A 1011M, Structural Steel, Type SS, Grade 33.
4. All steel located outside or in unconditioned space shall be galvanized Steel.
5. All courtyard bench hardware shall be stainless steel.

B. Finish steel assemblies and fasteners with rust-inhibitive primer, 2-mil (0.05-mm) dry film thickness.

2.3 FABRICATION

A. Camber: Fabricate horizontal and inclined members of less than 1:1 slope with either circular or parabolic camber equal to 1/500 of span.

B. End-Cut Sealing: Immediately after end cutting each member to final length, apply a saturation coat of end sealer to ends and other cross-cut surfaces, keeping surfaces flood coated for not less than 10 minutes.

C. Seal Coat: After fabricating, sanding, and end-coat sealing, apply a heavy saturation coat of penetrating sealer on surfaces of each unit.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Erect structural glued-laminated timber true and plumb, and 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.

B. Cutting: Avoid cutting after fabrication. Where field fitting is unavoidable, comply with requirements for shop fabrication.

C. Repair damaged surfaces after completing erection. Replace damaged structural glued-laminated timber if repairs are not approved by Architect.

D. 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 061800

SECTION 071353 - ELASTOMERIC SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. EPDM rubber sheet waterproofing for Storage Building.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET WATERPROOFING

A. RubberGard Eco White EPDM Rubber Sheet: ASTM D 6134, Type I, 60-mil- (1.5-mm-) thick flexible sheet, unreinforced, formed from EPDM.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Firestone Building Products.

2.2 AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

B. Concealed Sheet Flashing: Same material, construction, and thickness as sheet waterproofing or 60-mil- (1.5-mm-) thick, uncured EPDM, as required by manufacturer.

C. Exposed Sheet Flashing: 60-mil- (1.5-mm-) thick EPDM, cured or uncured, as required by manufacturer.

D. Bonding Adhesives: For bonding waterproofing sheets and sheet flashings to substrates and projections.

E. Splicing Cement and Cleaner: Single-component butyl splicing cement and solvent-based splice cleaner.

F. Lap Sealant: Single-component sealant.

G. In-Seam Sealant: Single-component sealant.

H. Waterproofing and Sheet-Flashing Accessories: Provide sealants, pourable sealers, cone and vent flashings, inside and outside corner flashings, termination reglets, and other accessories recommended by waterproofing manufacturer for intended use.

I. Metal Termination Bars: Manufacturer's standard aluminum bars, approximately 1 inch (25 mm) wide, prepunched, with fasteners.

J. Protection Course: Semirigid sheets of asphalt-impregnated organic mat, mineral surface, with a nominal thickness of 1/8 inch (3 mm).

K. Protection Course: Fan folded, with a core of extruded-polystyrene board insulation, a nominal thickness of 1/4 inch (6 mm), and a compressive strength of not less than 8 psi (55 kPa).

PART 3 - EXECUTION

3.1 FULLY ADHERED SHEET INSTALLATION

A. Prepare surfaces and install fully adhered sheets over entire area to receive waterproofing according to manufacturer's written instructions and recommendations in ASTM D 5843.

B. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required. Stagger end laps.

C. Apply bonding adhesive to substrates at required rate and allow it to partially dry.

D. Apply bonding adhesive to sheets and firmly adhere sheets to substrates. Do not apply bonding adhesive to splice area of sheet.

3.2 PARTIALLY ADHERED SHEET INSTALLATION

A. Prepare surfaces and install partially adhered sheets over entire area to receive waterproofing according to manufacturer's written instructions.

B. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required. Stagger end laps.

C. Apply bonding adhesive to the following areas of substrates and to each sheet at required rate and allow to partially dry:

1. Upper 25 percent of length of each sheet and 18 inches (457 mm) around perimeter of each sheet.

D. Firmly adhere sheets to substrate. Do not apply bonding adhesive to splice area of sheet.

E. Install partially adhered sheets and auxiliary materials to tie into existing waterproofing.

F. Repair tears, voids, and lapped seams in waterproofing that do not comply with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending beyond repaired areas in all directions.

G. Install compartmented, loosely laid sheets and auxiliary materials to tie into existing waterproofing.

H. Repair tears, voids, and lapped seams in waterproofing that do not comply with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending beyond repaired areas in all directions.

3.3 SEAM INSTALLATION

A. Cement Splice: Clean splice areas, apply splicing cement and in-seam sealant, and firmly roll side and end laps of overlapping sheets according to manufacturer's written instructions to

produce a splice not less than 6 inches (150 mm) wide and to ensure a watertight seam installation. Apply lap sealant and seal edges of sheet terminations.

B. Cement and Tape Splice: Clean splice areas, apply splicing cement and butyl gum tape, and firmly roll side and end laps of overlapping sheets according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal edges of sheet terminations.

3.4 SHEET FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to waterproofing manufacturer's written instructions.

B. Form wall flashings using exposed sheet flashing.

C. Extend deck sheet waterproofing to form wall flashings.

1. Flash penetrations and field-formed inside and outside corners with uncured sheet flashing.
2. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight installation. Apply lap sealant and seal edges of sheet flashing terminations.

D. Cover expansion joints and discontinuous deck-to-wall or deck-to-deck joints by extending deck sheet waterproofing over joints.

E. Terminate and seal top of sheet flashings with mechanically anchored termination bars.

F. On horizontal surfaces, loosely lay insulation drainage panels according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

END OF SECTION 071353

SECTION 071800 - TRAFFIC COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes traffic coatings and pavement markings for the following applications:

1. Pedestrian traffic ADA Path of Travel
2. Vehicular traffic ADA Parking
3. Parking area(s) striping.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product, including installation instructions.

B. Shop Drawings: For traffic coatings.

1. Include details for treating substrate joints and cracks, flashings, deck penetrations, and other termination conditions.

C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace traffic coating that fails in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Traffic Coatings: Complying with ASTM C 957.

B. Material Compatibility: Provide primers; base, intermediate, and topcoats; and miscellaneous materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.2 TRAFFIC COATING

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

B. Products: Subject to compliance with requirements, provide one of the following:

1. Tremco Incorporated, Sealant/Waterproofing Division; Vulkem 350/345/346
2. or equal

C. Preparatory and Base Coats: Tremco, Vulkem 350 or equal

D. Intermediate Coat: Tremco, Vulkem 345 or equal

E. Topcoat: Tremco, Vulkem 346 or equal

1. Color: As selected by Architect from manufacturer's full range.

F. Component Coat Thicknesses: As recommended by manufacturer for substrate and service conditions indicated, but not less than the following (measured excluding aggregate):

G. Aggregate: Uniformly graded, washed silica sand of particle sizes, shape, and minimum hardness recommended in writing by traffic coating manufacturer.

1. Spreading Rate: As recommended by manufacturer for substrate and service conditions indicated, but not less than the following:

a. Intermediate Coat: 8 to 10 lb/100 sq. ft. (3.6 to 4.5 kg/10 sq. m)
b. Topcoat: As required to achieve slip-resistant finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements and for other conditions affecting performance of traffic coatings.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
2. Verify compatibility with and suitability of substrates.
3. Begin coating application only after minimum concrete curing and drying period recommended by traffic coating manufacturer has passed, after unsatisfactory conditions have been corrected, and after surfaces are dry.
4. Verify that substrates are visibly dry and free of moisture.

5. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Clean and prepare substrates according to ASTM C 1127 and manufacturer's written recommendations to produce clean, dust-free, dry substrate for traffic coating application.

B. Mask adjoining surfaces not receiving traffic coatings, deck drains, and other deck substrate penetrations to prevent spillage, leaking, and migration of coatings.

3.3 JOINT AND CRACK TREATMENT

A. Prepare, treat, rout, and fill joints and cracks in substrates according to ASTM C 1127 and manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Comply with recommendations in ASTM C 1193 for joint-sealant installation.

3.4 TRAFFIC COATING APPLICATION

A. Apply traffic coating material according to ASTM C 1127 and manufacturer's written recommendations.

1. Verify that wet film thickness of each component coat complies with requirements every 100 sq. ft. (9 sq. m).

B. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated, and omit aggregate on vertical surfaces.

C. Cure traffic coatings according to manufacturer's written recommendations. Prevent contamination and damage during application and curing stages.

3.5 PROTECTING AND CLEANING

A. Protect traffic coatings from damage and wear during remainder of construction period.

B. Clean spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071800

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass-fiber blanket. R-30 for Roof (SEE TITLE 24) – and R-15 exterior walls.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Low-emitting product certification.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Research reports.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET

A. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:

1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

B. Glass-Fiber Blanket, Unfaced, R-30 Roof, ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

1. 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:

a. Owens Corning.

C. Glass-Fiber Blanket, Foil Faced, R-13 at exterior walls. ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

1. 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:

a. Owens Corning.

2.2 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
2. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.

C. 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 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. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. 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.

3.2 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors.

C. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket 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. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:

    a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

6. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.

    a. Exterior Walls: Set units with facing placed toward exterior of construction.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

END OF SECTION 072100

SECTION 073200 – CLAY ROOF TILES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Clay roof tiles.
2. Fasteners.
3. Underlayment.
4. Flashings and Counter flashings.
5. Roof Specialties.

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. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

A. Material test reports for clay roof tiles.

B. Evaluation reports for the following:

1. Clay roof tiles, fasteners, and attachment systems.
2. Synthetic underlayment.
3. High-temperature self-adhering underlayment.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products of this section in manufacturer's unopened packaging until installation.
B. Maintain storage area conditions for products of this section in accordance with manufacturer's instructions until installation.

1.6 WARRANTY

A. Product Warranty:
   1. The clay roof tile manufacturer shall provide a 50-year warranty guaranteeing material integrity and color fastness for roof tile.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Exterior Fire-Test Exposure: Provide concrete roof tiles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories, Inc. or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

2.2 MANUFACTURERS

A. MCAUnless otherwise specified for an individual product or material, supply all products specified in this section from the same manufacturer.

2.2 CLAY ROOF TILE

A. Roof Tile - General: Incombustible, vitrified tile manufactured from shale and fire clays, having less than 2.0 percent moisture absorption when tested in accordance with ASTM C 67, and meeting Grade 1 freeze/thaw resistance requirements when tested in accordance with ASTM C 1167.

1. Color: Standard color (OWNER TO SELECT)

B. Clay Roof Tile Type:

1. Acceptable field tile product: MCA Clay Roof Tile, Inc. 19 inch one piece “S” Mission Tile

2. Accessory/trim tile pieces required:
   a. Short Course Cover tile
   b. Eave Closure tile
   c. Top Fixture tile
   d. Rolled Rake tile
3. Hip & Ridge system required
   a. Ridge Tile Profile: Circular Cover (CC) Ridge
   b. Hip Tile Profile: Circular Cover (CC) Hip
   c. Closed Ridge End: Circular Cover (CC) Closed Ridge End (starter & finishers), non-decorative
   d. Hip Starter: Circular Cover (CC) Hip Starter, non-decorative
   e. Intersection Terminals: Standard, Non-decorative

2.3 ACCESSORY MATERIALS

A. Underlayment
   1.
      i. Field of Roof: Ludowici Pro 70 SBS Modified Bitumen Waterproofing, self-adhering

ii. Critical Roof Areas: Ludo Pro SBS-SA HT-S, SBS Modified Bitumen Waterproofing, self-adhering

B. Wood Stringers: S4S, maximum 19 percent moisture content, nominal 1.5 inch (38.1 mm) thick, of height required to support tile.
C. Flashing: 16oz/sq ft, 0.56mm thick ASTM B 370 cold rolled copper.
D. Tile Fasteners: Corrosion-resistant (copper or stainless to be specified/selected); types and sizes specified in manufacturer's instructions for indicated uses and conditions.
E. Copper Wire: 16 gauge (1.3 mm) minimum.
F. Grout for Finishing Rake Edges:

1. Mix the following materials in equal parts:

a. Factory-mixed mortar meeting requirements of ASTM C 387, Type M.
b. Factory-mixed surface bonding mortar meeting requirements of ASTM C 887.

4. Add mineral oxide pigment to match color of roof tile.
5. Add water and acrylic additive in accordance with mortar materials manufacturers' instructions to obtain correct mix for workability.

G. Roof Cement: Asphalt roof cement conforming to ASTM D 4586, Type I or II.
H. Sealant Used in Lieu of Flashing Cement: ASTM C 920 silicone; provide one of the following:

1. Dow Corning 790 Silicone Building Sealant.
2. GE SilProof.

I. Screws: No. 8 or No. 9 brass or stainless steel, flathead Phillips or square drive, not less than 1-3/4 inches (45 mm) long.
J. Nails for Solid Wood Deck: Corrosion resistant copper, brass, or stainless steel; minimum 3/8 inch (9.5 mm) head diameter; shank of minimum 11 gage (3 mm) diameter and length sufficient to penetrate 3/4 inch (19 mm) into deck but not through the underside.
K. Nails for Plywood Sheathing: Slater's copper ring shank nail, 11 gage (3 mm), not less than 1-3/4 inches (45 mm) long with 3/8 inch (9.5 mm) head; point must penetrate through underside of deck.
L. Wood Nailers and Cant Strips: Preservative-treated wood, as specified in Section 06 10 00.
M. Adhesive: NP1 Roof Tile Adhesive.

1. Do not expose to ultraviolet rays.
2. Do not allow direct contact with waterproofing shingle underlayment.

2.4 FLASHING FABRICATION

A. Form flashing to profiles indicated on drawings and as required to protect roofing materials from physical damage and shed water and in accordance with manufacturer's instructions for indicated project conditions.
B. Form sections square and accurate in profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
C. Fabricate other indicated sheet metal items as follows:

1. Gutters: SMACNA
2. Conductor heads: SMACNA
3. Downspouts: SMACNA

D. Fabrication of other indicated sheet metal items is specified in Section 07 60 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that roofing penetrations and plumbing stacks are in place and properly flashed to deck surface.
B. Verify that roof openings are correctly framed.
C. Verify that deck surfaces are dry and free of ridges, warps, and voids.

3.2 PREPARATION

A. Comply with tile manufacturer's recommendations on preparation of acceptable roof deck.
B. Broom clean deck surfaces prior to installation of underlayment.

3.3 UNDERLAYMENT AND ACCESSORY INSTALLATION

A. Underlayment:

1. Beginning at eave edge, install perpendicular to roof slope; extend minimum of 4 inches (100 mm) over gutters and valley flashing, and minimum 6 inches (150 mm) up abutting vertical surfaces.
2. Overlap side joints minimum 2-1/2 inches (64 mm); overlap end joints minimum 6 inches (150 mm).

B. Install flashing at all locations where roof intersects other roofs, sidewall or parapet walls, chimneys, ventilators, and similar projections, and at gable edges.

C. Valley Flashings:

1. Install minimum 24 inch (610 mm) wide flashing over full-width waterproofing membrane material; fasten metal to deck with cleats.
2. Overlap end joints minimum 8 inches (203.2 mm); do not solder joints.
3. Lap waterproofing membrane material over edges of flashing 4 inches (100 mm).

D. Intersections of Roof Surfaces and Abutting Vertical Surfaces:

1. Install continuous 12 inch (304 mm) wide strips of waterproof membrane material to extend 9 inches (228 mm) across roof deck and 3 inches (76 mm) up vertical surface.
2. Install continuous metal flashing to extend 3 inches (76 mm) up vertical surface.

3. At locations where vertical surface will abut top edge of tile, install metal flashing to extend 3 inches (76 mm) up vertical surface, form metal flashing to extend minimum 3 inches (76 mm) over tile, and form 1/2 inch (12 mm) return hem at edge of metal.
4. Form saddle flashings for protrusions through roof in accordance with manufacturer's instructions.

E. Fabricated Sheet Metal Items: Install in accordance with shop drawings and SMACNA ASMM.
F. Fabricated Sheet Metal Items: Installation is specified in Section 07 60 00.
G. Nailers: Install nominal 2 inch by appropriate height by 48 inches (50.8 mm by appropriate height by 1220 mm) pressure-treated wood nailers as detailed at ridge, hips and cover tiles, directly over underlayment. Protect with layer of waterproofing membrane material before installing hip and ridge accessory.

3.4 TILE INSTALLATION

A. Install tile roofing in strict conformance with manufacturer's instructions. Overhang of tile at eaves should be not less than 3/4 inch (19 mm) and not more than 2 inches (51 mm). This dimension should be related to the size of gutters and should either be shown on the drawings or specified here.
B. Install first course over eave closure, with overhang.

1. Do not drive fasteners tightly against tiles, to reduce risk of breakage and to allow natural deck movement.
2. Allow tile to "hang" on its fasteners.
3. Provide 3/4 inch (19 mm) to 2 inches (51 mm) overhang, permitting proper flow into gutters.

C. Install each subsequent course with maximum exposure in each course of 13 inches (330.2 mm). Wet cut tile at hips and valleys, using masonry saw with diamond blade.
D. At hip and ridge, and on mansard roofs, install bead of adhesive at butt end of each tile, located so it is completely concealed. Install sealant as required at hip and ridge accessories to achieve watertight installation.

3.5 PROTECTION

A. Do not permit traffic over finished roof surface unless absolutely necessary.
B. Minimize traffic over finished roof surface. If necessary, wear soft-soled shoes and walk on the "butt" of the tile in order to avoid breakage.
C. Replace tile broken due to improper protection or traffic control.

END OF SECTION

SECTION 076200 - 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:

1. Manufactured Products:

   a. Manufactured through-wall flashing and counterflashing.
   b. Manufactured reglets and counterflashing.

2. Formed Products:

   a. Formed roof drainage sheet metal fabrications.
   b. Formed low-slope roof sheet metal fabrications.
   c. Formed equipment support flashing.
   d. Formed wall flashing and trim.
   e. Formed roof drainage system.

B. Related Sections:

1. Division 04 Section "Unit Masonry Assemblies" for installing through-wall flashing, reglets and other sheet metal flashing and trim.
2. Division 06 Section "Rough Carpentry" for wood nailers, curbs, and blocking
3. Division 07 Section "Concrete Roof Tiles" for installing sheet metal flashing and trim integral with roofing.
4. Division 07 Section “Elastomeric Sheet Waterproofing" for installing sheet metal flashing and trim integral with membrane roofing.
5. Division 07 Section "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.
6. Division 07 Section "Joint Sealant" for field-applied sheet metal flashing and trim sealants.

1.3 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated 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.

B. Fabricate and install roof edge flashing capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:
   1. Wind Zone 1: For velocity pressures of 21 to 30 lbf/sq. ft.: 60-lbf/sq. ft. perimeter uplift force, 90-lbf/sq. ft. corner uplift force, and 30-lbf/sq. ft. outward force.

C. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.

   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F material surfaces.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:

   1. Identification of material, thickness, weight, and finish for each item and location in Project.
   2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
   3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
   4. Details of termination points and assemblies, including fixed points.
   5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
   6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
   7. Details of special conditions.
   8. Details of connections to adjoining work.
   9. Detail formed flashing and trim at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

   1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
   2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
   3. Accessories and Miscellaneous Materials: Full-size Sample.
   4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

E. Qualification Data: For qualified fabricator.

F. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

G. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that 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.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

C. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
2. Review methods and procedures related to sheet metal flashing and trim.
3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
4. Review special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect sheet metal flashing.
5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.6 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. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.7 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which 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 D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

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 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.

1. As-Milled Finish: Standard two-side bright finish.
2. Alclad Finish: Metallurgically bonded surfacing to both sides, forming a composite aluminum sheet with reflective luster.
3. Surface: Embossed.
4. Factory Prime Coating: Where painting after installation is indicated, pretreat with white or light-colored, factory-applied, baked-on epoxy primer coat; minimum dry film thickness of 0.2 mil (0.005 mm).
5. Color Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
   a. Color: As selected by Architect from full range of industry colors and color densities.
   b. Color Range: 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.
6. Exposed Coil-Coated Finishes:
   a. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   b. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.
7. Color: As selected by Architect from manufacturer's full range.
8. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed.

1. Finish: 4 (polished directional satin).
2. Surface: Smooth, flat.

D. Zinc Sheet: Zinc, 99 percent pure, alloyed with a maximum of 1 percent copper and titanium; with manufacturer's standard factory-applied, flexible, protective back coating.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Rheinzink America Inc.; RHEINZINK ProRoofing.
b. Umicore Building Products USA Inc.; VM ZINC PLUS.

2. Finish: Bright rolled.

2.2 UNDERLAYMENT MATERIALS

A. Polyethylene Sheet: 6-mil- thick polyethylene sheet complying with ASTM D 4397.

B. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

C. Slip Sheet: Building paper, 3-lb/100 sq. ft. minimum, rosin sized.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and 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.
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.
4. Fasteners for Zinc-Tin Alloy-Coated Stainless-Steel Sheet: Series 300 stainless steel.
5. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.
6. Fasteners for Zinc Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.

C. Solder:
1. For Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.

2. For Zinc-Tin Alloy-Coated Stainless Steel: ASTM B 32, 100 percent tin.
3. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.
4. For Zinc: ASTM B 32, 40 percent tin and 60 percent lead with low antimony, as recommended by manufacturer.

D. 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 wide and 1/8 inch thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

H. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 MANUFACTURED SHEET METAL FLASHING AND TRIM

A. Through-Wall Ribbed Sheet Metal Flashing: Manufacture through-wall sheet metal flashing for embedment in masonry with ribs at 3-inch (75-mm) intervals along length of flashing to provide an integral mortar bond. Manufacture through-wall flashing with interlocking counterflashing on exterior face, of same metal as reglet.

1. Stainless Steel: 0.016 inch (0.40 mm) thick.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) Cheney Flashing Company; Cheney Flashing (Dovetail).
2) Cheney Flashing Company; Cheney Flashing (Sawtooth).
3) Hohmann & Barnard, Inc.; STF Sawtooth Flashing.
4) Keystone Flashing Company, Inc.; Keystone Three-Way Interlocking Thruwall Flashing.
5) Sandell Manufacturing Company, Inc.; Pre-Formed Metal Flashing.

B. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with interlocking counterflashing on exterior face, of same metal as reglet.

1. 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:

    a. Cheney Flashing Company.
    b. Fry Reglet Corporation.
    c. Heckmann Building Products Inc.
    d. Hickman, W. P. Company.
    e. Hohmann & Barnard, Inc.; STF Sawtooth Flashing.
    f. Keystone Flashing Company, Inc.
    g. National Sheet Metal Systems, Inc.
    h. Sandell Manufacturing Company, Inc.

2. Material: Galvanized steel, 0.022 inch (0.56 mm) thick.
3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
4. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
5. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
6. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
7. Accessories:

    a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
    b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

8. Finish: Mill

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, 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 without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

G. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

H. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

I. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.

J. Do not use graphite pencils to mark metal surfaces.

2.6 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars**,** and gutter accessories from same metal as gutters.

1. Gutter Style: specified in Division 07 Section "Roof Specialties.

2. Expansion-joint options in first subparagraph below are based on SMACNA designations and illustrations. Butt type with cover plate hides the expansion joint on front and bottom sides. Limit use of built-in gutter expansion joints to thicker metals capable of being welded.
3. Expansion Joints: Built in.
4. Accessories: Wire ball downspout strainer.
5. Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following materials:
   a. Galvanized Steel: 0.022 inch (0.56 mm) thick.

6. Gutters with Girth 16 to 20 Inches (410 to 510 mm): Fabricate from the following materials:
   a. Galvanized Steel: 0.028 inch (0.71 mm) thick.

B. Downspouts: Fabricate round downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
1. Manufactured Hanger Style: SMACNA figure designation architect to select based on manufacturer's full range.
2. Fabricate from the following materials:

   a. Galvanized Steel: 0.022 inch (0.56 mm) thick.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof-Edge Flashing and Fascia Cap: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long, sections. Furnish with 6-inch- (150-mm-) wide, joint cover plates.

1. Joint Style: Butt, with 12-inch- (300-mm-) wide, concealed backup plate.
2. Fabricate with scuppers spaced 10 feet (3 m) apart, of dimensions required with 4-inch- (100-mm-) wide flanges and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.
3. Fabricate from the following materials:
   a. Galvanized Steel: 0.028 inch (0.71 mm) thick.

B. Roof and Roof to Wall Transition, Roof to Roof Edge Flashing and Fascia Cap Transition, Expansion-Joint Cover: Fabricate from the following materials:

1. Galvanized Steel: 0.034 inch (0.86 mm)

C. Base Flashing: Fabricate from the following materials:
1. Galvanized Steel: 0.028 inch (0.71 mm) thick.

D. Counterflashing: Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

E. Flashing Receivers: Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

F. Roof-Penetration Flashing: Fabricate from the following materials:
1. Galvanized Steel: 0.028 inch (0.71 mm) thick.

G. Roof-Drain Flashing: Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch (0.71 mm) thick.

2.8 WALL SHEET METAL FABRICATIONS

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 where flashing is discontinuous. Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch (0.71 mm) thick.

2.9 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following materials:
1. Galvanized Steel: 0.028 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions 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.

B. For the record, 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 UNDERLAYMENT INSTALLATION

A. General: Install underlayment as indicated on Drawings.

B. Polyethylene Sheet: Install polyethylene sheet with adhesive for anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches (50 mm).

C. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

D. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing

underlayment at low temperatures. 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. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

A. General: 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, welding rods, 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 and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. 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.
3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
5. Install sealant tape where indicated.
6. Torch cutting of sheet metal flashing and trim is not permitted.
7. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

1. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.

D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws and metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints as shown and as required for watertight construction.

1. Where sealant-filled joints are used, 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 moderate, between 40 and 70 deg F (4 and 21 deg C), 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 (4 deg C).

2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
2. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended 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.

3.4 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.

1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
2. Provide elbows at base of downspout to direct water away from building.
3. Connect downspouts to underground drainage system indicated.

C. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in elastomeric sealant compatible with [roofing membrane.

D. Parapet Scuppers: Install scuppers where indicated through parapet. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

1. Anchor scupper closure trim flange to exterior wall and solder or seal with elastomeric sealant to scupper.
2. Loosely lock front edge of scupper with conductor head.
3. Solder or seal with elastomeric sealant exterior wall scupper flanges into back of conductor head.

E. Conductor Heads: Anchor securely to wall with elevation of conductor head rim 1 inch (25 mm) below scupper discharge.

F. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches (100 mm) in direction of water flow.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at 24-inch centers.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated.
   1. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

D. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.
   1. Anchor interior leg of coping with screw fasteners and washers at 24-inch centers.

E. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

F. 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 a minimum of 4 inches (100 mm) and bed with sealant. Secure in a waterproof manner by means of interlocking folded seam or blind rivets and sealant] [anchor and washer at 36-inch (900-mm) centers.

G. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant 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 SMACNA recommendations and as indicated. 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 Division 04 Section Unit Masonry.

C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.7 MISCELLANEOUS FLASHING INSTALLATION

A. Overhead-Piping Safety Pans: Suspend pans independent from structure above as 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.

3.8 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.9 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 installation, remove unused materials and clean finished surfaces. Maintain in a 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.

END OF SECTION 076200

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copings.
2. Roof-edge specialties.
3. Roof-edge drainage systems.
4. Reglets and counterflashings.

B. Preinstallation Conference: Conduct conference at Project site.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each type of roof specialty and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For tests performed by a qualified testing agency.

B. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class.

1.6 WARRANTY

A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 073200 , Clay Roof Tiles.

B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

    a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    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. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. SPRI Wind Design Standard: Manufacture and install copings and roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:

1. Design Pressure: As indicated on Drawings.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C) , material surfaces.

2.2 COPINGS

A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet (3.6 m), concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.

1. Metallic-Coated Steel Sheet Coping Caps: Zinc-coated (galvanized) steel, nominal 0.034-inch (0.86-mm) thickness.

    a. Surface: Smooth, flat finish.
    b. Finish: Two-coat fluoropolymer.
    c. Color: As selected by Architect from manufacturer's full range.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Castle Metal Products.
2. Hickman Company, W. P.

C. Gutters: Manufactured in uniform section lengths with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch (25 mm) above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.

1. Zinc-Coated Steel: Nominal 0.034-inch (0.86-mm) thickness.
2. Gutter Profile: 6”x3” Half-round single bead according to SMACNA's "Architectural Sheet Metal Manual."
3. Corners: Factory mitered and continuously welded.
4. Gutter Supports: Manufacturer's standard supports as selected by Architect with finish matching the gutters.
5. Gutter Accessories: Wire ball downspout strainer, Bullnose ends for half-round gutter.

D. Downspouts: Plain round complete with smooth-curve elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Zinc-Coated Steel: Nominal 0.034-inch (0.86-mm) thickness.

E. Parapet Scuppers: Manufactured with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof.

1. Zinc-Coated Steel: Nominal 0.034-inch thickness.

F. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout, exterior flange trim, and built-in overflow.

1. Zinc-Coated Steel: Nominal 0.034-inch thickness.

G. Zinc-Coated Steel Finish: Three-coat metallic fluoropolymer.

1. Color: As selected by Architect from manufacturer's full range.

2.3 REGLETS AND COUNTERFLASHINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Fry Reglet Corporation.
2. Keystone Flashing Company, Inc.
3. Metal-Era, Inc.

B. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:

1. Zinc-Coated Steel: Nominal 0.028-inch (0.71-mm) thickness.
2. Corners: Factory mitered and continuously welded.

3. Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
4. Stucco Type, Embedded: Provide reglets with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
5. Concrete Type, Embedded: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.

C. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches (100 mm) and in lengths not exceeding 12 feet (3.6 m) designed to snap into reglets and compress against base flashings with joints lapped, from the following exposed metal:

1. Zinc-Coated Steel: Nominal 0.028-inch (0.71-mm) thickness.

D. Accessories:

1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

E. Zinc-Coated Steel Finish: Three-coat metallic fluoropolymer.

1. Color: As selected by Architect from manufacturer's full range.

2.4 MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.

2.5 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: ASTM D 1970/D 1970M; stable after testing at 240 deg F (116 deg C).
2. Low-Temperature Flexibility: ASTM D 1970/D 1970M; passes after testing at minus 20 deg F (29 deg C).

3. 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:

a. Carlisle Coatings & Waterproofing Inc.
b. Henry Company.

c. Owens Corning.

B. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

C. Slip Sheet: Rosin-sized building paper, 3-lb/100 sq. ft. minimum.

2.6 MISCELLANEOUS MATERIALS

A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.

B. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.7 FINISHES

A. Coil-Coated Galvanized-Steel Sheet Finishes:

1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A 755/A 755M and coating and resin manufacturers' written instructions.

a. Three-Coat Metallic Fluoropolymer: AAMA 621. Fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches (152 mm) staggered 24 inches (610 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

1. Apply continuously under copings, roof-edge specialties and reglets and counterflashings.
2. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.

B. Felt Underlayment: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

C. Slip Sheet: Install with tape or adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

3.2 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of uncoated aluminum and stainless-steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of 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] [substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F (4 deg C).

3.3 COPING INSTALLATION

A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements.
2. Interlock face-leg drip edge into continuous cleat anchored to substrate at manufacturer's required spacing that meets performance requirements.

3.4 ROOF-EDGE SPECIALITIES INSTALLATION

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.5 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion-joint caps.
2. Install continuous leaf guards on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.

1. Provide elbows at base of downspouts at grade to direct water away from building.
2. Connect downspouts to underground drainage system indicated.

D. Parapet Scuppers: Install scuppers through parapet where indicated. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

E. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch (25 mm) below scupper discharge.

3.6 REGLET AND COUNTERFLASHING INSTALLATION

A. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches (100 mm) over top edge of base flashings.

B. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant. Fit counterflashings tightly to base flashings.

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 and sealants.

C. Remove temporary protective coverings and strippable films as roof specialties are installed.

END OF SECTION 077100

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof curbs.
2. Equipment supports.
3. Roof hatches.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of roof accessory.

B. Shop Drawings: For roof accessories.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within **20** years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, integral metal cant, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Air Balance Inc.; a division of MESTEK, Inc.
    b. Curbs Plus, Inc.
    c. LMCurbs.
    d. Milcor; Commercial Products Group of Hart & Cooley, Inc.

B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.

C. Material: Zinc-coated (galvanized) steel sheet, 0.052 inch thick.

1. Finish: Baked enamel or powder coat
2. Color: As selected by Architect from manufacturer's full range.

D. Construction:

1. Curb Profile: Manufacturer's standard compatible with roofing system.
2. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
3. Top Surface: Level top of curb, with roof slope accommodated by sloping deck-mounting flange or by use of leveler frame.
4. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
5. Insulation: Factory insulated with 1-1/2-inch thick glass-fiber board insulation.
6. Wind Restraint Straps and Base Flange Attachment: Provide wind restraint straps, welded strap connectors, and base flange attachment to roof structure at perimeter of curb, of size and spacing required to meet wind uplift requirements.
7. Platform Cap: Where portion of roof curb is not covered by equipment, provide weathertight platform cap formed from 3/4-inch thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
8. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.

2.2 EQUIPMENT SUPPORTS

A. Equipment Supports: Internally reinforced perimeter or Rail-type metal equipment supports capable of supporting superimposed live and dead loads between structural supports, including equipment loads and other construction indicated on Drawings, spanning between structural supports; capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, integral metal cant, and integrally formed structure-mounting flange at bottom.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Air Balance Inc.; a division of MESTEK, Inc.
    b. Curbs Plus, Inc.

c. LMCurbs.
d. Milcor; Commercial Products Group of Hart & Cooley, Inc.

B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.

C. Material: Zinc-coated (galvanized) steel sheet, 0.052 inch thick.

1. Finish: Baked enamel or powder coat
2. Color: As selected by Architect from manufacturer's full range.

D. Construction:

1. Curb Profile: Manufacturer's standard compatible with roofing system.
2. Insulation: Factory insulated with 1-1/2-inch thick glass-fiber board insulation.
3. Wind Restraint Straps and Base Flange Attachment: Provide wind restraint straps, welded strap connectors, and base flange attachment to roof structure at perimeter of curb of size and spacing required to meet wind uplift requirements.
4. Platform Cap: Where portion of equipment support is not covered by equipment, provide weathertight platform cap formed from 3/4-inch thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
5. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as equipment support.
6. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
7. Fabricate equipment supports to minimum height of 12 inches above roofing surface unless otherwise indicated.
8. Sloping Roofs: Where roof slope exceeds 1:48, fabricate each support with height to accommodate roof slope so that tops of supports are level with each other. Equip supports with water diverters or crickets on sides that obstruct water flow.

2.3 ROOF HATCH

A. Roof Hatches: Metal roof-hatch units with lids and insulated double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, integral metal cant, and integrally formed deck-mounting flange at perimeter bottom.

1. 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:

a. Bilco Company (The).
b. Hi Pro International, Inc.
c. Metallic Products Corp.
d. Milcor; Commercial Products Group of Hart & Cooley, Inc.

B. Type and Size: Single-leaf lid, 30 by 36 inches.

C. Loads: Minimum 40-lbf/sq. ft. external live load and 20-lbf/sq. ft. internal uplift load.

D. Hatch Material: Zinc-coated (galvanized) steel sheet.

1. Thickness: Manufacturer's standard thickness for hatch size indicated.
2. Finish: Baked enamel or powder coat.
3. Color: As selected by Architect from manufacturer's full range.

E. Construction:

1. Insulation: Polyisocyanurate board.

a. R-Value: 12.0 according to ASTM C 1363.

2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
3. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
4. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
5. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.

F. Hardware: Spring operators, hold-open arm, galvanized-steel spring latch with turn handles, galvanized-steel butt- or pintle-type hinge system, and padlock hasps inside and outside.

G. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.

1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
2. Height: 42 inches above finished roof deck.
3. Material: Steel tube.
4. Post: 1-5/8-inch diameter pipe.
5. Finish: Manufacturer's standard baked enamel or powder coat.

a. Color: As selected by Architect from manufacturer's full range.

2.4 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.

1. Baked-Enamel or 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).

B. A 792/A 792M, AZ50 (AZM150) coated.

1. Baked-Enamel or 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).

C. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.

D. Steel Tube: ASTM A 500/A 500M, round tube.

E. Galvanized-Steel Tube: ASTM A 500/A 500M, round tube, hot-dip galvanized according to ASTM A 123/A 123M.

F. Steel Pipe: ASTM A 53/A 53M, galvanized.

2.5 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Polyisocyanurate Board Insulation: ASTM C 1289, thickness and thermal resistivity as indicated.

C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.

D. Underlayment:
1. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
2. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:

E. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

F. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.

1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.

3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.

C. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

3.2 REPAIR AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."

C. Clean exposed surfaces according to manufacturer's written instructions.

D. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes joint sealants for the following applications:

1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
2. Exterior joints in horizontal traffic surfaces.
3. Interior joints in vertical surfaces and horizontal nontraffic surfaces.
4. Interior joints in horizontal traffic surfaces.

B. See Division 32 Section "Concrete Paving Joint Sealants" for sealing joints in pavements, walkways, and curbing.

C. See Division 08 Section "Glazing" for glazing sealants.

1.2 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples: For each kind and color of joint sealant required.

C. Compatibility and adhesion test reports.

D. Sample warranties.

E. Product test reports.

1.4 QUALITY ASSURANCE

1. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

2. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

B. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates according to the method in ASTM C 1193 that is appropriate for the types of Project joints.

1.5 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric 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's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:

1. Architectural sealants shall have a VOC content of 250 g/L or less.
2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
3. Sealants and sealant primers for nonporous substrates shall have a VOC content of 775 g/L or less.
4. All sealants to meet requirements of the Green Building Code.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.3 MATERIALS, 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 sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.4 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Multicomponent Nonsag Neutral-Curing Silicone Sealant :

1. Products:

    a. Dow Corning Corporation; 756 H.P.

2. Type and Grade: M (multicomponent) and P (pourable).
3. Class: 50.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

C. Single-Component Pourable Neutral-Curing Silicone Sealant :

1. Products:

    a. Dow Corning Corporation; 890-SL.
    b. Pecora Corporation; 300 Pavement Sealant (Self Leveling).
    c. Dow Corning Corporation; SL Parking Structure Sealant.

2. Type and Grade: S (single component) and P (pourable).
3. Class: 100/50.
4. Use[**s**] Related to Exposure: NT and T (traffic).
5. Uses Related to Joint Substrates: M, A and O, as applicable to joint substrates indicated.
    a. Pecora Corporation; 898.

6. Type and Grade: S (single component) and NS (nonsag).
7. Class: 100/50.
8. Use Related to Exposure: NT (nontraffic).
9. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
10. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.

D. Single-Component Neutral-Curing Silicone Sealant:

1. Products:

    a. Dow Corning Corporation; 799.
    b. GE Silicones; UltraGlaze SSG4000.
    c. GE Silicones; UltraGlaze SSG4000AC.
    d. Polymeric Systems Inc.; PSI-631.

e. Schnee-Morehead, Inc.; SM5731 Poly-Glaze Plus.
f. Tremco; Proglaze SG.
g. Tremco; Spectrem 2.
h. Tremco; Tremsil 600.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.

E. Single-Component Mildew-Resistant Acid-Curing Silicone Sealant :

1. Products:

a. Dow Corning Corporation; 786 Mildew Resistant.
b. GE Silicones; Sanitary SCS1700.
c. Tremco; Tremsil 200 White, Clear.

2. Type and Grade: S (single component) and NS (nonsag).

F. Multicomponent Nonsag Urethane Sealant :

1. Products:

a. Schnee-Morehead, Inc.; Permathane SM 7200.
b. Sika Corporation, Inc.; Sikaflex - 2c NS TG.
c. Sonneborn, Division of ChemRex Inc.; NP 2.
d. Tremco; Vulkem 227.
e. Tremco; Vulkem 322 DS.

2. Type and Grade: M (multicomponent) and NS (nonsag).
3. Class: 25.
4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

G. Multicomponent Nonsag Urethane Sealant :

1. Products:

a. Bostik Findley; Chem-Calk 500.
b. Pacific Polymers, Inc.; Elasto-Thane 227 R Type II (Gun Grade).
c. Polymeric Systems Inc.; PSI-270.
d. Tremco; Dymeric.

2. Type and Grade: M (multicomponent) and NS (nonsag).
3. Class: 25.
4. Additional Movement Capability: 40 percent movement in extension and 25 percent in compression for a total of 65 percent movement.
5. Use Related to Exposure: NT (nontraffic).

6. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.

H. Multicomponent Nonsag Urethane Sealant :

1. Products:

    a. Pacific Polymers, Inc.; Elasto-Thane 227 High Shore Type II (Gun Grade).
    b. Pacific Polymers, Inc.; Elasto-Thane 227 Type II (Gun Grade).
    c. Pecora Corporation; Dynatred.
    d. Polymeric Systems Inc.; PSI-270.

2. Type and Grade: M (multicomponent) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: T (traffic).
5. Uses Related to Joint Substrates: M, G**,** A, and, as applicable to joint substrates indicated, O.

I. Multicomponent Pourable Urethane Sealant:

1. Products:

    a. Bostik Findley; Chem-Calk 550.
    b. Meadows, W. R., Inc.; POURTHANE.
    c. Pacific Polymers, Inc.; Elasto-Thane 227 High Shore Type I (Self Leveling).
    d. Pacific Polymers, Inc.; Elasto-Thane 227 Type I (Self Leveling).
    e. Pecora Corporation; Urexpan NR-200.
    f. Polymeric Systems Inc.; PSI-270SL.
    g. Schnee-Morehead, Inc.; Permathane SM 7201.
    h. Tremco; THC-901.
    i. Tremco; THC-900.
    j. Tremco; Vulkem 245.
    k. Pecora Corporation; Urexpan NR 300, Type H.
    l. Pecora Corporation; Urexpan NR 300, Type M.

2. Type and Grade: M (multicomponent) and P (pourable).
3. Class: 25,12-1/2.
4. Use Related to Exposure: T (traffic).
5. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.

J. Multicomponent Pourable Urethane Sealant:

1. Products:

    a. Pecora Corporation; Dynatrol II-SG.
    b. Sika Corporation, Inc.; Sikaflex - 2c SL.
    c. Sonneborn, Division of ChemRex Inc.; SL 2.

2. Type and Grade: M (multicomponent) and P (pourable).
3. Class: 25.

4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

6. Type and Grade: S (single component) and NS (nonsag).
7. Class: 25.
8. Uses Related to Exposure: T (traffic) and NT (nontraffic).
9. Uses Related to Joint Substrates: M, G**,** A, and, as applicable to joint substrates indicated, O.

2.5 PREFORMED JOINT SEALANTS

A. Preformed Silicone-Sealant System: Manufacturer's standard system consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.

1. Products:

a. Dow Corning Corporation; 123 Silicone Seal.
b. GE Silicones; UltraSpan US1100.
c. Pecora Corporation; Sil-Span.
d. Tremco; Spectrem Ez Seal.

B. Preformed Foam Sealant: Manufacturer's standard mildew-resistant, nonmigratory, nonstaining, preformed, precompressed, open-cell foam sealant that is manufactured from high-density urethane foam impregnated with a nondrying, water-repellent agent.

1. Products:

a. EMSEAL Joint Systems, Ltd.; Emseal 25V.
b. illbruck Sealant Systems, Inc.; Wilseal 600.
c. Polytite Manufacturing Corporation; Polytite B.
d. Sandell Manufacturing Co., Inc.; Polyseal.

2.6 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) 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. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low

compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

D. 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 where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.

    a. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.

2. Remove laitance and form-release agents from concrete.

    a. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended in writing by joint-sealant manufacturer, based on 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 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.

3.2 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

B. 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.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

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 according to requirements specified 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 configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

F. Installation of Preformed Silicone-Sealant System: Comply with manufacturer's written instructions.

G. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

H. 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.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes hollow-metal work.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required.

E. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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. Apex Industries, Inc.
2. Commercial Door & Hardware Inc.
3. Gensteel Doors, Inc.

2.2 REGULATORY REQUIREMENTS

A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

B. Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.3 INTERIOR DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. At locations indicated in the Door and Frame Schedule.

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:

    a. Type: As indicated in the Door and Frame Schedule.
    b. Thickness: 1-3/4 inches (44.5 mm).
    c. Face: cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
    d. Edge Construction: Model 2, Seamless.
    e. Core: Manufacturer's standard.

3. Frames:

    a. Materials: steel sheet, minimum thickness of 0.053 inch (1.3 mm).
    b. Sidelite Frames: Fabricated from same thickness material as adjacent door frame.
    c. Construction: Full profile welded.

4. Exposed Finish: Factory Prime.

2.4 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. For all exterior doors and doors between apparatus rm and other adjacent rooms.

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:

    a. Type: As indicated in the Door and Frame Schedule.
    b. Thickness: 1-3/4 inches (44.5 mm).
    c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum A40 (ZF120) coating.
    d. Edge Construction: Model 2, Seamless.

e. Core: Manufacturer's standard insulation material.

3. Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu (0.370 K x sq. m/W) when tested according to ASTM C 1363.
4. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
b. Construction: Full profile welded.

5. Exposed Finish: Factory Prime and finish. Architect to select color from Manufacturer’s full range.

2.5 BORROWED LITES

A. Hollow-metal frames of steel sheet, minimum thickness of 0.053 inch (1.3 mm).

B. Construction: Full profile welded.

2.6 FRAME ANCHORS

A. Jamb Anchors:

1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.7 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.

G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).

I. Glazing: Section 088000 "Glazing."

2.8 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
2. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
4. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:

        1) Three anchors per jamb up to 60 inches (1524 mm) high.
        2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.

5. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow-metal work.
5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.9 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: SDI A250.10.

B. Factory Finish: SDI A250.3.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.10 ACCESSORIES

A. Louvers: Provide sight proof louvers for interior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch- (0.5-mm-) thick, cold-rolled steel sheet set into 0.032-inch- (0.8-mm-) thick steel frame.

B. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

C. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. At fire-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable stops located on secure side of opening.
    d. Install door silencers in frames before grouting.
    e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
8. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors:

a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
b. At Bottom of Door: 5/8 inch (15.8 mm) plus or minus 1/32 inch (0.8 mm).
c. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).

C. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.2 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 081433 - STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. 1 ¾” Interior stile and rail wood doors.
2. Finishing stile and rail wood doors.
3. Fitting stile and rail wood doors to frames and machining for hardware.
4. Prehanging doors in frames.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and other pertinent data.

C. Samples: Representing typical range of color and grain for each species of veneer and solid lumber required.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Use only materials that comply with referenced standards and other requirements specified. Assemble exterior doors and sidelites with wet-use adhesives.

B. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea-formaldehyde resins.

2.2 INTERIOR STILE AND RAIL WOOD DOORS

A. Interior Stile and Rail Wood Doors: Interior doors complying with WDMA I.S.6, "Industry Standard for Wood Stile and Rail Doors."

1. Manufacturers: Subject to compliance with requirements, Many local woodwork firms produce stile and rail doors. Insert local firms that produce suitable doors if required.

a. ETO Doors – MA300 Classic Interior Solid Core 3 Panel Mahogany Slab Vintage Door.
b. Or Equal.

2. Finish and Grade: Transparent, Standard.
3. Wood Species: Mahogany
4. Door Construction for Transparent Finish:
   a. Stile and Rail Construction: Veneered, structural composite lumber

   b. Raised-Panel Construction: Veneered, wood-based panel product with mitered, raised rims made from matching clear lumber.
   c. Raised-Panel Construction: Veneered, shaped, wood-based panel product with veneer conforming to raised-panel shape.

5. Raised-Panel Thickness: 1-3/4 inches (44 mm)
6. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

2.3 STILE AND RAIL WOOD DOOR FABRICATION

A. Fabricate stile and rail wood doors in sizes indicated for field fitting.

B. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels unless otherwise indicated:

   1. Clearances: Provide 1/8 inch (3 mm) at heads, jambs, and between pairs of doors. Provide 1/2 inch (13 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide not more than 3/8 inch (10 mm) from bottom of door to top of threshold.

   2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

C. Factory machine doors for hardware that is not surface applied.

D. Transom and Side Panels: Fabricate panels to match adjoining doors in materials, finish, and quality of construction.

E. Prehung Doors: Provide stile and rail doors as prehung units including doors, frames, and hardware.

   1. Provide wood door frames, other than fire-rated wood door frames,] that comply with Division 06 Section "Interior Finish Carpentry, Interior Architectural Woodwork."
   2. Provide hardware that complies with Division 08 Section "Door Hardware."

2.4 SHOP PRIMING

A. Doors for Transparent Finish: Shop prime doors with stain (if required), other required pretreatments, and first coat of finish as specified in Division 09 Section "Staining and Transparent Finishing." Seal all four edges, edges of cutouts, and mortises with first coat of finish.

2.5 FINISHING

A. Transparent Finish:

1. Grade: Premium.
2. Finish: AWI catalyzed polyurethane
3. Staining: Match Architect's sample
4. Effect: Open-grain finish
5. Sheen: Satin.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fire-rated wood door frames level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Countersink fasteners, fill surface flush, and sand smooth.

B. Hardware: For installation, see Division 08 Section "Door Hardware."

C. Install wood doors to comply with manufacturer's written instructions, WDMA I.S.6, "Industry Standard for Wood Stile and Rail Doors”.

D. Field-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.

1. Clearances: Provide 1/8 inch (3 mm) at heads, jambs, and between pairs of doors. Provide 1/2 inch (13 mm)] from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 3/8 inch (10 mm)] from bottom of door to top of threshold.

2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

E. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

END OF SECTION 081433

SECTION 083323 - OVERHEAD COILING DOORS - STORAGE BUILING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Overhead coiling insulated doors.

1.2 RELATED SECTIONS

A. Section 05500 - Metal Fabrications: Support framing and framed opening.

B. Section 06200 - Finish Carpentry: Wood jamb and head trim.

C. Section 08710 - Door Hardware: Product Requirements for cylinder core and keys.

D. Section 09900 - Painting: Field applied finish.

1.3 REFERENCES

A. ANSI/DASMA 108 - American National Standards Institute Standard Method For Testing Sectional Garage Doors And Rolling Doors: Determination Of Structural Performance Under Uniform Static Air Pressure Difference.

B. NFRC 102 - Test Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.

C. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.

D. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

E. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

F. ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

G. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

H. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

I. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

J. NEMA MG 1 - Motors and Generators.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Overhead coiling insulated doors:
   1. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf (958 Pa) or design pressure required by 2019 CBC, whichever is greater without damage to door or assembly components in conformance with ASTM E 330.
   2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.

B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Details of construction and fabrication.
   4. Installation instructions.

C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.

F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

G. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.

B. Installer Qualifications: Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.

C. Store materials in a dry, warm, ventilated weathertight location.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 COORDINATION

A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

1.10 WARRANTY

A. Warranty: Manufacturer’s limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.

B. Warranty: Manufacturer’s limited door system warranty for 2 years for all parts and components.

C. PowderGuard Finish
1. PowderGuard Premium Applied to curtain, guides, bottom bar, headplates: Manufacturer’s limited Premium Finish warranty for 2 years.

2. PowderGuard Zinc Base Coat applied to guides, bottom bar, headplates plus PowderGuard Premium applied to curtain and top coat for guides, bottom bar, headplates: Manufacturer's limited Zinc Finish warranty for 4 years.
3. PowderGuard Textured: Applied to curtain, guides, bottom bar, headplates: Manufacturer's limited Textured Finish warranty for 3 years.
4. PowderGuard Zinc Base Coat applied to guides, bottom bar, headplates plus PowderGuard Textured applied to curtain and top coat for guides, bottom bar, headplates: Manufacturer's limited Zinc Finish warranty for 4 years.
5. PowderGuard Max: Applied to curtain, guides, bottom bar, headplates: Manufacturer's limited Max Finish warranty for 5 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: info@overheaddoor.com.

a. Substitutions:
Alpine Overhead Doors, Inc.
b. Clopay Building Products.
c. Janus International Corporation.
d. Lawrence Roll-Up Doors, Inc.

B.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 INSULATED OVERHEAD COILING SERVICE DOORS

A. Overhead Coiling Stormtite Advanced Performance Insulated Service Doors: Overhead Door Corporation Stormtite AP Model 627.
1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
a. Flat profile type FIT-265 for doors up to 40 feet (12.19 m) wide.
b. Front slat fabricated of:
1) 22 gauge galvanized steel.
c. Back slat fabricated of:
1) 24 gauge galvanized steel.
d. Slat cavity filled with CFC-free foamed-in-place, polyurethane insulation.
1) R-Value: 10.9, U-Value: 0.09.
2. Performance:
a. Through Curtain Sound Rating: Sound Rating: STC-28 (STC-30+ with HZ noise generator) as per ASTM E 90.
b. Installed System Sound Rating: STC-21 as per ASTM E 90.

c. U-factor: 0.84 NFRC test report, maximum U-factor of no higher than 1.00.
d. Air Infiltration: Meets ASHRAE 90.1 and IECC 2012/2015 C402.4.3 Air leakage <1.00 cfm/ft2.

3. Slats and Hood Finish:
   a. Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
      1) Powder Coat:
         (a) PowderGuard Premium powder coat color as selected by the Architect.
      2) Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
      3) Finish: Powder Coat:
         (a) PowderGuard Premium powder coat color as selected by the Architect.
4. Weatherseals:
   a. Vinyl bottom seal and internal hood seals.
   b. Interior and exterior EPDM triple-seal finned guide weatherseal.
   c. Lintel weatherseal.
   d. Air Infiltration Package: IECC 2012/2015 listed; product to meet C402.4.3 2012 Air leakage <1.00 cfm/ft2.
      1) Air infiltration perimeter seal package includes: guide cover, guide cap, PVC weatherseal on exterior of guide, EPDM triple finned weatherseal on interior of guide, lintel weatherseal and vinyl bottom seal.
5. Bottom Bar:
   a. Two powder coated black steel angles minimum thickness 1/8 inch (3 mm) bolted back to back to reinforce curtain in the guides.
6. Guides: Three structural steel angles.
7. Brackets:
   a. Hot rolled powder coated black steel to support counterbalance, curtain and hood.
8. Finish; Guides, Headplate and Brackets:
   a. Finish: Black powdercoat finish.
9. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.
10. Hood: Provide with internal hood baffle weatherseal.
    a. 24 gauge galvanized steel with intermediate supports as required.
11. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
    a. Sensing Edge Protection:
       1) Electric sensing edge.
    b. Operator Controls:
       1) Push-button and key operated control stations with open, close, and stop buttons.
       2) Controls for both interior and exterior location.

3) Controls surface mounted.
c. Special Operation:
1) Photocell operation.
d. Motor Voltage: 115/230 single phase, 60 Hz.
12. Windload Design:
a. Standard windload shall be 20 PSF.
13. Locking:
a. Interior slide bolt lock for electric operation with interlock switch.
14. Wall Mounting Condition:
a. Face-of-wall mounting.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify opening sizes, tolerances and conditions are acceptable.

B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

E. Coordinate installation of electrical service with Section 16150. Complete wiring from disconnect to unit components.

F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.

G. Install perimeter trim and closures.

H. Instruct Owner’s personnel in proper operating procedures and maintenance schedule.

3.4 ADJUSTING

A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.

B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.

B. Remove labels and visible markings.

C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

A. Protect installed products until completion of project.

END OF SECTION

SECTION 085123 - STEEL WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. [**Light intermediate**] [**Standard intermediate**] [**Heavy intermediate**] [**Heavy custom**] steel windows from hot-rolled sections.
2. Cold-formed, [**welded**] [**mechanically fastened**] steel windows.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide steel windows capable of withstanding the effects of the following loads and stresses within limits and under conditions indicated:

1. Wind Loads: Uniform pressure of [**30 lbf/sq. ft. (1436 Pa)**] [**60 lbf/sq. ft. (2873 Pa)**] <**Insert value**>, acting inward or outward.

B. Air Infiltration for Weather-Stripped Ventilators: Not more than [**0.37 cfm/ft. (0.18 L/s per m)**] <**Insert value**> of ventilator crack length at an inward test pressure of [**6.24 lbf/sq. ft. (298 Pa)**] <**Insert value**> when tested according to ASTM E 283.

C. Air Infiltration for Non-Weather-Stripped Ventilators: Not more than 1.0 cfm/ft. (0.47 L/s per m) of ventilator crack length at an inward test pressure of 1.56 lbf/sq. ft. (75 Pa), when tested according to ASTM E 283.

D. Water Penetration: No leakage for 15 minutes when window is subjected to a rate of flow of 5 gal./h per sq. ft. (0.005 L/s) with a differential pressure across the window of [**2.86 lbf/sq. ft. (137 Pa)**] [**6.24 lbf/sq. ft. (298 Pa)**] when tested according to ASTM E 331.

E. Crack Tolerances: Test each type and size of required window unit, with ventilators closed and locked, for compliance with the SWI.

F. Forced-Entry Resistance: Comply with Performance Grade [**10**] <**Insert grade**> requirements when tested according to ASTM F 588.

G. Condensation-Resistance Factor: Provide steel windows tested for thermal performance according to AAMA 1504 showing a CRF of [**36**] [**40**] <**Insert value**>.

H. Thermal Transmittance: Provide steel windows with a maximum whole-window U-factor according to ASTM C 236 and AAMA 1503 of [**0.49**] <**Insert value**> Btu/sq. ft. x h x deg F [**2.8**] <**Insert value**> W/sq. m x K.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each exposed finish.

D. Product test reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An installer acceptable to steel window manufacturer for installation of units required for this Project.

B. Fire-Test-Response Characteristics: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to the test method indicated.

1. Positive-Pressure Test: [**ASTM E 2010**] [**NFPA 257, conducted so that within the first 10 minutes of test, furnace pressure is adjusted to place at least two-thirds of the test specimen above the neutral-pressure plane and to maintain this plane for the balance of test**].
2. Neutral-Pressure Test: UL 9.
3. Fire-Protection Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
4. Provide steel windows labeled with appropriate markings of applicable testing and inspecting agency.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of steel 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.
c. Water leakage or air infiltration.
d. Faulty operation of operable sash and hardware.
e. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
f. Insulating-glass failure.

2. Warranty Period: [**One**] [**Two**] [**Three**] <**Insert number**> year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hot-Rolled Steel Windows:

a. A & S Window Associates, Inc.
b. William Bayley Company (The).
c. Bliss-Nor Am Windows & Doors.
d. Crittall Windows North America; Fox Steel Co. (The).
e. Hope's Windows, Inc.
f. Torrance Steel Window Co., Inc.
g. <**Insert manufacturer's name.**>

2. Cold-Formed Steel Windows:

a. DV Fyre-Tec, Inc.
b. Optimum Window Manufacturing Corp.
c. <**Insert manufacturer's name.**>

2.2 MATERIALS

A. Hot-Rolled Steel Window Members: Provide frame and ventilator members formed from hot-rolled, new billet steel sections.

1. [**Light intermediate**] [**Standard intermediate**] [**Heavy intermediate**] [**Heavy custom**] steel windows from hot-rolled sections.

B. Cold-Formed Steel Window Members: Provide frame and ventilator members mechanically formed from metallic-coated, low-carbon, cold-rolled steel sheet complying with ASTM A 653.

1. Cold-formed, [**welded**] [**mechanically fastened**] steel windows.

C. Trim members, screen frames, retainers for weather stripping, flashing, and similar items shall be [**extruded aluminum**] [**formed sheet aluminum**] [**stainless steel**] [**formed steel**] [**manufacturer's standard**].

D. Glazing beads shall be [**extruded aluminum**] [**formed sheet aluminum**] [**stainless steel**] [**formed steel**] [**manufacturer's standard**].

E. Fasteners: Provide fasteners of bronze, brass, stainless steel, or other metal, that are warranted by manufacturer to be noncorrosive and compatible with trim, hardware, anchors, and other components of steel windows.

F. Anchors, Clips, and Window Accessories: Provide units of stainless steel, hot-dip zinc-coated steel, bronze, brass, or iron complying with ASTM A 123. Provide units with sufficient strength to withstand design pressure indicated.

G. Compression-Type Weather Stripping: Provide compressible weather stripping designed for permanently resilient sealing under bumper or wiper action and to be completely concealed when steel window is closed.

H. Sealant: For sealants required within fabricated windows, provide manufacturer's standard, permanently elastic, nonshrinking, and nonmigrating type recommended by sealant manufacturer for joint size and movement.

I. Glass: [**Uncoated clear float**] [**Uncoated tinted float**] [**Coated clear float**] [**Coated tinted float**] [**Uncoated insulating**] [**Low-E insulating**] [**Reflective insulating**] [**Reflective and low-E insulating**] glass complying with Division 08 Section "Glazing."

J. Glazing Product for Fire-Protection-Rated Windows: [**Wired glass**] [**Fire-protection-rated glazing product**] complying with Division 08 Section "Glazing."

K. Hardware: Provide manufacturer's standard [**nonremovable**], [**solid bronze**] [**malleable iron**] [**die-cast metal**] hardware, with operating components of stainless steel, carbon steel complying with AAMA 907, brass, bronze, or other corrosion-resistant material designed to operate smoothly, to close tightly, and to lock steel window ventilators securely. Provide hardware of sufficient strength to accommodate size and weight of ventilator for which it is intended.

1. Automatic Closer for Fire-Rated Steel Sash: Heat[**and electrically**] activated spring-driven closer.

L. Insect Screens: Provide insect screens for each operable exterior ventilator. Locate screens on the inside or the outside of the ventilator, depending on window type. Design windows and hardware to accommodate screens in a tight-fitting removable arrangement with a minimum of exposed fasteners and latches.

2.3 ACCESSORIES

A. General: Provide manufacturer's standard accessories that comply with indicated standards.

B. Window Cleaner's Anchor Bolts: Provide window cleaner's bolts of standard design, complying with requirements of authorities having jurisdiction.

C. Pole Operators: Provide one pole operator and pole hanger for every room that has operable windows more than 72 inches (1830 mm) above the floor.

2.4 FABRICATION

A. General: Fabricate steel windows of type and in sizes indicated to comply with SWI standards. Include a complete system for assembly of components and anchorage of window units.

1. Provide units that are reglazable without dismantling ventilator framing.
2. Prepare window ventilators for [**glazing**] [**preglazing at the factory**].

B. Window Types: Provide the following types of steel windows:

1. Fixed windows.
2. Casement windows.
3. Projected windows.
4. Pivoting windows.
5. [**Double**] [**Single**]-hung windows.
6. Horizontal sliding windows.

2.5 GALVANIZED STEEL FINISHES

A. Galvanized Hot-Rolled Windows: After fabrication, provide treatment consisting of chemical cleaning complying with SSPC-SP 1, pickling complying with SSPC-SP 8, and hot-dip galvanizing complying with ASTM A 123.

1. After galvanizing, provide a 1.0-mil (0.03-mm) dry film thickness, shop-applied finish consisting of a hot-phosphate solution treatment followed by a chromic-acid rinse, drying and a special dip-metal primer coating, and oven drying for 30 minutes at 300 deg F (150 deg C).

2.6 STEEL FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Surface Preparation: Clean surfaces of dirt, oil, grease, scale, and other contaminants; follow with a [**zinc**] [**iron**]-phosphate pretreatment applied according to window manufacturer's written recommendations.

C. Shop Prime Coat Finish: After fabrication, provide manufacturer's standard epoxy prime coat.

D. Powder-Coat Finish: Provide manufacturer's powder-coat finish.

E. Baked-Enamel Finish: Immediately after cleaning and pretreatment, apply manufacturer's standard 2-coat baked-enamel finish consisting of prime coat and thermosetting topcoat.

F. High-Performance Organic Coating: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Architect's sample**] [**As selected by Architect from manufacturer's full range**].

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's written instructions for installing windows, hardware, operators, accessories, and other components.

B. Install windows level, plumb, and true to line, without distortion. Anchor securely to surrounding construction with approved fasteners.

1. Separate corrodible surfaces subject to electrolytic action at points of contact with other materials.

3.2 FIELD QUALITY CONTROL

A. Testing Agency: [**Owner will engage**] [**Engage**] a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502, Test Method [**A**] [**B**], by applying same test pressures required to determine compliance with ASTM E 283 for air infiltration and ASTM E 331 for water resistance.
2. Testing Extent: [**Three**] [**Three mockup**] <**Insert number or description**> windows as selected by Architect and a qualified independent testing and inspecting agency. Windows shall be tested immediately after installation.
3. Test Reports: Prepare according to AAMA 502.

B. Remove and replace steel windows where test results indicate that they do not comply with specified requirements.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain steel windows. Refer to Division 01 Section "[**Closeout Procedures**] [**Demonstration and Training**]."

END OF SECTION 085123

SECTION 088000 – GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Glass for doors and interior door side lites
2. Glazing sealants and accessories.
3. Windows: Dual Glazed windows to meet requirements found in Title 24 calculations.

1.2 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 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.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Preconstruction adhesion and compatibility test report.

1.5 QUALITY ASSURANCE

A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 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.

1.7 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

2. Warranty Period: 10 years from date of Substantial Completion.

B. 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 the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AGC Glass Company North America, Inc.
2. Cardinal Glass Industries.
3. Gardner Glass, Inc.
4. Glasswerks LA, Inc.
5. Guardian Industries Corp.; SunGuard.
6. Door manufacturer’s Glass Company

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E 1300.

1. Design Wind Pressures: As indicated on Drawings.
2. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

B. Windborne-Debris-Impact Resistance: Exterior glazing shall comply with basic-protection testing requirements in ASTM E 1996 for Wind Zone 3 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on Project and shall be installed in same manner as glazing indicated for use on Project.

1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.
2. Small-Missile Test: For glazing located more than 30 feet (9.1 m) above grade.

C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

D. 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. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

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. GANA Publications: “Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3. (use in all exterior doors and doors between apparatus rm and other interior spaces including all door side lites).

C. Heat-Strengthened Float Glass: ASTM C 1048, 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.

2.5 INSULATING GLASS IN METAL DOORS AND METAL FRAMED SIDE LITES

1. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190. Provide Kind FT (fully tempered) float glass in place of annealed or Kind HS (heat-strengthened) float glass where safety glass is indicated or required by code.

B.

1. Sealing System: Dual seals.
2. Spacer: Manufacturer's standard spacer material and construction.

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. Field-applied sealants shall have a VOC content of not more than 250 g/L.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Dow Corning Corporation.

b. Sika Corporation.
c. Tremco Incorporated.

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 C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.

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 the 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. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

PART 3 - EXECUTION

3.1 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).

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 according to requirements in referenced glazing publications.

3.2 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. Apply heel bead of elastomeric sealant.

F. 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.

G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 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 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 by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.4 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.

3.5 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 come into 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.

3.6 MONOLITHIC GLASS SCHEDULE

3.7 INSULATING GLASS SCHEDULE

A. Glass Type: Clear insulating glass (w/ Low-E-coating on all exterior doors) . Provide Kind FT (fully tempered) float glass in place of annealed or Kind HS (heat-strengthened) float glass where safety glass is indicated or required by code.

1. Overall Unit Thickness: 5/8 inch (16 mm).
2. Minimum Thickness of Each Glass Lite: 5 mm.
3. Outdoor Lite:Fully tempered float glass.
4. Interspace Content: Argon.
5. Indoor Lite: Fully tempered float glass.
6. Winter Nighttime U-Factor: (see Title 24 requirements) maximum.
7. Summer Daytime U-Factor: (see Title 24 requirements) maximum.
8. Safety glazing required.

END OF SECTION 088000

SECTION 088300 - 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. This Section includes the following types of silvered flat glass mirrors.
   1. Film-backed glass mirrors qualifying as safety glazing.

B. Related Sections include the following:

   1. Division 10 Section "Toilet, Bath, and Laundry Accessories" for metal-framed mirrors.
   2. Stainless Steel Framed Mirrors for the Weight Room as shown in the Interior Elevations.

1.3 DEFINITIONS

A. Deterioration of Mirrors: Defects developed from normal use that are attributable to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning mirrors contrary to mirror manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1.4 PERFORMANCE REQUIREMENTS

A. Provide mirrors that will not fail under normal usage. Failure includes glass breakage and deterioration attributable to defective manufacture, fabrication, and installation.

1.5 SUBMITTALS

A. Product Data: For the following:

   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.
   2. Mirror mastic.
   3. Mirror hardware.

B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachments to other work.

C. Samples: For each type of mirror product required, in the form indicated below:

1. Mirrors, 12 inches (300 mm) square, including edge treatment on 2 adjoining edges.
2. Mirror clips.
3. Mirror trim, 12 inches (300 mm) long.

D. Product Certificates: For each type of mirror and mirror mastic, signed by product manufacturer.

E. Qualification Data: For Installer.

F. Mirror Mastic Compatibility 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.

G. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed mirror glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in mirror installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under NGA's Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).

B. Source Limitations for Mirrors: Obtain mirrors from one source for each type of mirror indicated.

C. Source Limitations for Mirror Glazing Accessories: Obtain mirror glazing accessories from one source for each type of accessory indicated.

D. Glazing Publications: Comply with the following published recommendations:

1. GANA's "Glazing Manual" unless more stringent requirements are indicated. Refer to this publication for definitions of glass and glazing terms not otherwise defined in this Section or in referenced standards.
2. GANA Mirror Division's "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."

E. Safety Glazing Products: For film-backed mirrors, provide products complying with testing requirements in 16 CFR 1201 for Category II materials.

F. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing and substrates on which mirrors are installed.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from 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, protected from moisture including condensation.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form, made out to Owner and signed by mirror manufacturer agreeing to replace mirrors that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below:

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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:

B. Manufacturers: Subject to compliance with requirements, provide mirrors by one of the following:

1. Arch Aluminum & Glass Co., Inc.
2. Gardner Glass Products.
3. Gilded Mirrors, Inc.
4. Guardian Industries Corp.
5. Independent Mirror Industries, Inc.
6. Lenoir Mirror Company.
7. Messer Industries, Inc.
8. Stroupe Mirror Co., Inc.
9. Sunshine Mirror.
10. Virginia Mirror Company, Inc.
11. VVP America, Inc.; Binswanger Mirror Products.
12. Walker Glass Co., Ltd.

2.2 SILVERED FLAT GLASS MIRROR MATERIALS

A. Tempered Clear Glass Mirrors: Comply with ASTM C 1503, Mirror Glazing Quality, for blemish requirements in annealed float glass before silver coating is applied, for coating requirements, and with other requirements not affected by tempering process; and comply with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied.

1. Nominal Thickness: 3.0 mm.

2.3 MISCELLANEOUS MATERIALS

A. Setting Blocks: Elastomeric material with a Type A Shore 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, produced specifically for setting mirrors and certified by both mirror manufacturer 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:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Gunther Mirror Mastics.
    b. Palmer Products Corporation.

3. VOC Content: Not more than 70 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.4 MIRROR HARDWARE

A. Top and Bottom 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 bottom and top edges of each mirror in a single piece.

1. Bottom Trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch (9.5 and 22 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm).
2. Top Trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch (16 and 25 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm).
3. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
4. Products: Subject to compliance with requirements, provide one of the following:

    a. Bottom Trim:

1) Laurence, C. R. Co., Inc.; CRL Standard "J" Channel.
2) Sommer & Maca Industries, Inc.; Medium Gauge Aluminum Shallow Nose "J" Moulding Lower Bar.
3) Sommer & Maca Industries, Inc.; Heavy Gauge Aluminum Shallow Nose "J" Moulding Lower Bar.

b. Top Trim:

1) Laurence, C. R. Co., Inc.; CRL Deep "J" Channel.
2) Sommer & Maca Industries, Inc.; Medium Gauge Aluminum Deep Nose "J" Moulding Upper Bar.
3) Sommer & Maca Industries, Inc.; Heavy Gauge Aluminum Deep Nose "J" Moulding Lower Bar.

5. 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.
6. 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.
7. 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.
c. Cleat: C. R. Laurence Co., Inc.; D 1637M Mirror Mount System Cleat.

B. Mirror Bottom Clips: As indicated.

C. Mirror Top Clips: As indicated.

D. Plated Steel Hardware: Formed-steel shapes with plated finish indicated.

1. Profile: As indicated.

E. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

F. 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. Mirror Sizes: To suit Project conditions, cut mirrors to final sizes and shapes.

B. Cutouts: 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 edge.

1. Seal edges of mirrors 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 pressure-sensitive 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. Use adhesives and film backing compatible with mirror backing paint as certified by mirror manufacturer.

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.

1. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic with existing finishes or primers.
2. Proceed with mirror 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 surfaces with mastic manufacturer's special bond coating where applicable.

3.3 INSTALLATION

A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.

B. Provide a minimum air space 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. For wall-mounted mirrors, install mirrors with mastic and mirror hardware.

1. 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.
2. For mirror hardware in the form of continuous J-channels at bottom, 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, 2 slotted weeps not less than 1/4 inch (6.4 mm) wide by 3/8 inch (9.5 mm) long.
3. For mirror hardware in the form of a continuous J-channel at bottom and continuous top trim at top, fasten J-channel directly to wall and attach top trim to continuous cleat fastened directly to wall.

4. For metal or plastic clips, place a felt or plastic pad between mirror and each clip to prevent spalling of mirror edges.
5. Where indicated, install mirror hardware in the form of J-channels that are fabricated in single lengths to fit and cover top and bottom edges of mirrors.
6. Where indicated, install bottom trim and top clips. Fabricate bottom trim in single lengths to fit and cover bottom edges of mirrors. Locate top clips so they are symmetrically placed and evenly spaced.
7. Where indicated, install bottom and top clips symmetrically placed and evenly spaced.
8. 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 air space 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 will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

END OF SECTION 088300

SECTION 089000 - LOUVERS AND VENTS

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. Louvers and vents in hollow metal doors.

B. 2. Gable end vents.

1.2 SUMMARY

A. Section Includes:
1. Adjustable, extruded-aluminum louvers.
2. Fixed, formed metal louvers in hollow-metal doors

B. Related Sections:

1. Division 04 Section "Unit Masonry" for building wall vents (brick vents) into masonry.
2. Division 08 Section "Hollow Metal Doors and Frames" for louvers in hollow-metal doors.
3. Division 09 Section "Exterior Painting" for field painting louvers.
4. Division 23 Sections for louvers that are a part of mechanical equipment.
5. Division 23 Section "Instrumentation and Control for HVAC" for electric, electronic, and pneumatic control of adjustable louvers.
6. Division 26 Sections for electrical power connections for motor-operated adjustable louvers.

1.3 DEFINITIONS

A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.

B. Horizontal Louver: Louver with horizontal blades; i.e., the axes of the blades are horizontal.

C. Vertical Louver: Louver with vertical blades; i.e., the axes of the blades are vertical.

D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

E. Storm-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design louvers, including comprehensive engineering analysis by a qualified professional engineer, using structural and seismic performance requirements and design criteria indicated.

B. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
   1. Wind Loads: Determine loads based on a uniform pressure of 20 lbf/sq. ft. (957 Pa), acting inward or outward.

C. Seismic Performance: Louvers, including attachments to other construction, shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
   1. Component Importance Factor is 1.5.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes, without buckling, opening of joints, overstressing of components, failure of connections, or other detrimental effects.

   1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

E. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

   1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

   1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
   2. Show mullion profiles and locations.
   3. Wiring Diagrams: For power, signal, and control wiring for motorized adjustable louvers.

C. Samples for Verification: For each type of metal finish required.

D. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified

testing agency, for each type of louver and showing compliance with performance requirements specified.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain louvers and vents from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
2. AWS D1.3, "Structural Welding Code - Sheet Steel."
3. AWS D1.6, "Structural Welding Code - Stainless Steel."

C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

D. UL and NEMA Compliance: Provide motors and related components for motor-operated louvers that are listed and labeled by UL and comply with applicable NEMA standards.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Galvanized-Steel Sheet: ASTM A 653/A 653M, G60 (Z180) zinc coating, mill phosphatized.

B. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use tamper-resistant screws for exposed fasteners unless otherwise indicated.
2. For fastening galvanized steel, use hot-dip-galvanized steel or 300 series stainless-steel fasteners.
3. For color-finished louvers, use fasteners with heads that match color of louvers.

C. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.2 FABRICATION, GENERAL

A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

C. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

1. Frame Type: Channel unless otherwise indicated.

D. Include supports, anchorages, and accessories required for complete assembly.

E. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches (1830 mm) o.c., whichever is less.

1. Fully Recessed Mullions: Where indicated, provide mullions fully recessed behind louver blades. Where length of louver exceeds fabrication and handling limitations, fabricate with close-fitting blade splices designed to permit expansion and contraction.

F. Provide extended sills for recessed louvers.

G. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.3 FIXED, FORMED-METAL LOUVERS

A. Horizontal, Drainable-Blade Louver:

1. 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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Air Balance Inc.; a Mestek company.
b. Air Flow Company, Inc.
c. Airolite Company, LLC (The).
d. American Warming and Ventilating, Inc.; a Mestek company.
e. Arrow United Industries; a division of Mestek, Inc.
f. Cesco Products; a division of Mestek, Inc.
g. Construction Specialties, Inc.
h. Dowco Products Group; Safe-Air of Illinois, Inc.
i. Greenheck Fan Corporation.
j. Industrial Louvers, Inc.

k. Metal Form Manufacturing Inc.
l. NCA Manufacturing, Inc.
m. Ruskin Company; Tomkins PLC.
n. United Enertech Corp.
o. Vent Products Company, Inc.

3. Louver Depth: 4 inches (100 mm)
4. Frame and Blade Material and Nominal Thickness: Galvanized-steel sheet, not less than 0.052 inch (1.32 mm) for frames and 0.040 inch (1.02 mm) for blades.
5. Mullion Type: Exposed.
6. Louver Performance Ratings:

   a. Free Area: Not less than 7.0 sq. ft. (0.65 sq. m) for 48-inch- (1220-mm-) wide by 48-inch- (1220-mm-) high louver.
   b. Point of Beginning Water Penetration: Not less than 800 fpm (4.1 m/s)
   c. Air Performance: Not more than 0.10-inch wg (25-Pa) static pressure drop at 700-fpm (3.6-m/s) free-area exhaust or intake velocity.

7. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.4 LOUVER SCREENS

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.
2. Screening Type: Bird screening.

B. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Metal: Same kind and form of metal as indicated for louver to which screens are attached.
2. Finish: Same finish as louver frames to which louver screens are attached.
3. Type: Non-rewirable, U-shaped frames.

2.5 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.6 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

2.7 INSTALLATION

A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

F. Protect unpainted galvanized and nonferrous-metal surfaces that will be 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.

G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 07 Section "Joint Sealants" for sealants applied during louver installation.

2.8 ADJUSTING AND CLEANING

A. Test operation of adjustable louvers and adjust as needed to produce fully functioning units that comply with requirements.

B. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

C. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

D. Restore louvers and 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.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 089000

SECTION 092400 –PORTLAND CEMENT PLASTER

PART 1- GENERAL

1.01 SUMMARY

A. Section Includes: Work includes all labor, materials, and equipment necessary to install all aspects of the portland cement plaster.

B. Related Sections

1. 03 30 00 – Cast-in-Place Concrete
2. 06 11 00 – Wood Framed Construction
3. 06 16 00 – Sheathing
4. 07 90 00 – Joint Sealers

1.02 REFERENCES

A. ASTM C150 – Portland Cement

B. ASTM C847 – Standard Specification for Metal Lath

C. ASTM C1032 - Woven Wire Plaster Base

D. ASTM C933 - Welded Wire Lath

E. ASTM C144/C897 – Aggregate for Job-Mixed Portland Cement-Based Plaster

F. ASTM C926 – Application of Portland Cement-Based Plaster

G. ASTM C1063 – Installation of Lathing and Furring for Portland Cement Based Plaster

H. PCA (Portland Cement Association) – Plaster (Stucco) Manual

I. Plaster and Drywall Systems Manual, Third Edition

J. ICC-ES Acceptance Criteria for Weather-resistive Barriers (AC38)

K. Omega Three Coat Systems Details (TCS)

1.03 SYSTEM DESCRIPTION

A. General: Portland cement plaster is comprised of a water-resistive barrier, optional sheathing, metal lath, scratch and brown coats, and a finish coat.

B. Application Methods: The plaster is applied directly to a structure at the construction site.

1.04 SUBMITTALS

A. Product Data: All product data sheets, evaluation reports, details, and warranty information that pertain to the project in accordance with Section 01 30 00 Submittal Procedures.

B. Samples: Submitted upon request.

1. Samples of the finish coat shall be of an adequate size as required to represent each color and texture to be utilized on the project and produced using the same techniques and tools required to complete the project.
2. Retain approved samples at the construction site throughout the application process.

1.05 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: System component materials shall be manufactured or approved by Omega Products International, and shall be distributed by the same or its authorized dealers.

B. Plastering Contractor:
   1. Shall specialize in cement plasterwork with documented experience.
   2. Shall provide proof of current contractor's license and bond where required.

C. On-Site Mockups: Produced upon request.
   1. Prior to commencement of work, provide a mockup for approval.
   2. Mockup suitable to represent the products to be installed for each color and texture constructed using the same tools and techniques to be utilized on the project.
   3. Retain approved mockup at job site throughout the application process.
      a. Where acceptable to the architect, approved mockups may become part of the completed work if undisturbed at time of substantial completion.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver all materials to the construction site in their original, unopened packaging with labels intact.

B. Inspection: Inspect the materials upon delivery to ensure that specified products have been received. Report defects or discrepancies to the responsible party according to the construction documents; do not use reported material for application.

C. Storage: Store all products per manufacturer's recommendations. Generally, store materials in a cool, dry location; away from direct contact with the ground and/or concrete; out of direct sunlight; and protect from weather and other damage.

1.07 PROJECT CONDITIONS

A. Environmental Requirements: Follow product manufacturer's recommendations for environmental conditions and surface preparation.
   1. Temperatures: Before, during, and following the application of the plaster, the ambient and surface temperatures must remain above 40°F (4°C) for a minimum period of 24 hours. Protect stucco from uneven and excessive evaporation, especially during hot, dry and/or windy weather. Protect the portland cement plaster from freezing for a period of not less than 24 hours after set has occurred.
   2. Substrates: Prior to installation, inspect the wall for surface contamination or other defects that may adversely affect the performance of the materials and shall be free of residual moisture. Do not apply plaster to substrates whose temperatures are less than 40°F (4°C) or contain frost or ice.
   3. Inclement Weather: Protect applied material from inclement weather until dry.

B. Existing Conditions:
   1. Jobsite Resources: Provide access to electrical outlets, clean, potable water, and a suitable work area at the construction site throughout the application of the portland cement plaster.

1.08 SEQUENCING AND SCHEDULING

A. Sequencing: Coordinate the installation of the portland cement plaster with all other construction trades. To reduce the likelihood of the stucco cracking, it is recommended the building carry a minimum of 90 percent of the dead building load and the interior gypsum be installed prior to installation of the stucco.

B. Staffing: Provide sufficient manpower to ensure continuous operation, free of cold joints, scaffolding lines, variations in texture, etc.

1.09 WARRANTY

A. System Warranty: Submit documentation on standard system warranties. At completion of work, provide written system warranty documentation.

B. Warranty Length: Three (5) years commencing at the time of substantial completion.

1.10 MAINTENANCE

A. The following materials shall be presented to the owner following the application of the work:

1. One container of finish for each color and texture utilized on the project.
2. A maintenance program for finishes as required.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Omega Products International.

2.02 SCRATCH AND BROWN COAT

A. Cement: **Plastic cement complying with ASTM C1328.**

B. Sand:

1. Sand must be clean and free from deleterious amounts of loam, clay, silt, soluble salts and organic matter.
2. Sampling and testing must comply with ASTM C144 or C897.

C. Water: Clean and potable without foreign matter.

2.03 WATER-RESISTIVE BARRIER

A. Over Open Framing and non-Wood-based Sheathing

One layer of D kraft building paper complying with UBC Standard 14-1.

B. Over Wood-based Sheathing:

Two layers of D kraft building paper complying with UBC Standard 14-1.

2.04 LATH

A. Welded Wire: Nominal No. 16 gauge (0.065 inch), 2-inch-by-2-inch opening, galvanized steel complying with ASTM C933.

B. Expanded Lath: Nominal 3.4 lb/yd2 weight, galvanized steel complying with ASTM C847. For Soffits and horizontal surfaces.

2.05 ACCESSORIES

A. Caulking: **Acrylic latex complying with ASTM C834**

B. Vapor Retarder: A vapor retarder complying with local code must be provided. See 2.03.

C. Flashing: Flashing complying with local code, IBC Section 1405.4, or IRC Section R703.4, as applicable, must be provided.

D. Fasteners: Nails, staples, or screws used to rigidly secure lath and associated accessories shall be corrosion-resistant and meet the minimum requirements of ASTM C1063.

E. Zinc and Zinc-Coated (Galvanized) Accessories: The following accessories shall be fabricated from **zinc or zinc-coated (galvanized) steel**.

1. Corner Bead: Minimum 26-gauge thick; expanded flanges shaped to permit complete embedding in plaster; minimum 2 in. wide; **Bull-nose** style; use unless otherwise indicated.
2. Strip Mesh: Metal Lath, 3.4 lb/yd^2 expanded metal; 6 in. wide x 18 in. long.
3. Vent Screed: Minimum 26-gauge thick; thickness governed by plaster thickness; minimum 4-inch (102 mm) width, double “V” profile, with perforated expanse between “V’s” of longest possible lengths.
4. Casing Bead: Minimum 26-gauge thick; thickness governed by plaster thickness; maximum possible lengths; expanded metal flanges, with square edges.
5. Drip Screed: Minimum 26-gauge thick, depth governed by plaster thickness, minimum 3-1/2 in. high flange, maximum possible lengths.
6. Control and Expansion Joints: Depth to conform to plaster thickness; use maximum practical lengths.
    a. Control Joints: One-piece-type, folded pair of unperforated screeds in **M-shaped** configuration; removable protective tape on plaster face of control joint.
    b. Expansion Joints: Two-piece-type formed to produce a slip-joint.

2.06 CRACK ISOLATION SYSTEM

A. Mesh: Alkali resistant, 4.5 oz., woven glass fiber fabrics specially manufactured by Omega Products International.

B. Base coat: **StyroGlue DryBond or StyroGlue** manufactured by Omega Products International.

2.07 PRIMER

A. **AkroFlex** primer manufactured by Omega Products International.

2.08 FINISHES

A. AkroFlex: Smooth, steel trowel finish: 100% acrylic-based finish manufactured by Omega Products International.

B. Color shall be as selected by the Architect.

2.09 MIXES

A. Cement Plaster: Mix and proportion cement plaster in accordance with ASTM C926 and local codes.

B. Finishes: Mixing and tinting instructions are contained in the appropriate product data sheets by Omega Products International.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to the application of the cement plaster the plastering contractor shall ensure that:
   1. Surface and site conditions are ready to receive work.
   2. Grounds and Blocking: Verify that the items within the walls for other sections of work have been installed.

B. Substrates:
   1. Acceptable substrates must be securely fastened per applicable building code requirements.
   2. Acceptable substrates and adjacent materials must be dry, clean, and sound. Substrate surface must be flat, free of fins or planar irregularities greater than ¼ nch in 10 feet (6mm in 3m).

C. Flashings: All flashing around windows, at deck attachments, utility penetrations, roof lines, etc. and all kick-out flashing must be properly installed prior to application of the cement plaster.

D. Unsatisfactory conditions shall be reported to the general contractor and/or builder and/or architect and/or owner. Do not proceed until all unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Substrate: Clean the substrate to which the plaster is to be applied, ensuring that there are no foreign materials present; including, but are not limited to, oil, dirt, dust form release agents, efflorescence, paint, wax, water repellants, moisture, frost, and or extended nails that may rupture the water-resistive barrier.

B. Surrounding Areas: Protect surfaces near the work of this section from damage, disfiguration, and overspray. Mask off all dissimilar materials.

3.03 INSTALLATION, GENERAL

A. General Installation: Refer to **<insert local code>**, ASTM C926, ASTM C1063, and/or the appropriate manufacturer's product data sheet for additional installation requirements and recommendations.

3.04 INSTALLING WEATHER PROTECTION

A. Water-Resistive Barrier: Apply water-resistive barrier complying with Section 1404.2 of the IBC or Section R703.2 of the IRC, as applicable.

B. Flashing: Install flashing and trim per **2022 CBC.**

3.05 INSTALLING LATH

A. General: Installed per ASTM C1063.

3.06 INSTALLING CEMENT PLASTER

A. Application Over Metal Lath: Apply per ASTM C926 and C1063. Apply portland cement plaster by hand-troweling or machine-spraying to a nominal thickness of 3/8-inch (9.5mm) scratch coat and to a nominal thickness of 3/8-inch (9.5 mm) brown coat.

B. Moist Curing: Moist curing is a critical step in the plaster system application. Provide sufficient moisture by fog or moist curing to permit proper hydration of the cementitious materials. The length of time and most effective procedure for curing will depend on climatic and job conditions.

3.07 INSTALLING CRACK ISOLATION SYSTEM

A. After brown coat has properly cured, apply base coat to wall and fully embed mesh into base coat. See the appropriate Omega product data sheet for mixing and application instruction. A minimum two-inch (51 mm) overlap is required at all mesh joints. Base coat surface shall be left suitable for the application of the finish.

3.08 INSTALLING FINISH COAT

A. General: Apply per manufacturer's product data sheet.

B. Verification: Verify the desired color and texture match the approved sample and/or mockup prior to installation.

3.09 CLEANING

A. Cleaning: Remove any and all materials used, overspray from adjacent surfaces, and all protective masking.

3.10 PROTECTION

A. Protection: Protect applied material from inclement weather until dry and prevent it from freezing for a minimum of 24 hours after set and/or until dry. Refer to manufacturer's product data sheet for additional requirements.

END OF SECTION 092400

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each texture finish indicated on same backing indicated for Work.

PART 2 - PRODUCTS

2.1 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 E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 10 percent.

B. Regional Materials: Gypsum panel products shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

C. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C 1396/C 1396M.

1. 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:

a. American Gypsum.
b. Georgia-Pacific Building Products.
c. USG.

B. Gypsum Board, Type X: ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

C. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

1. Core: 5/8 inch (15.9 mm), Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:

a. Bullnose Cornerbead, typ.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. L-Bead: L-shaped; exposed long flange receives joint compound.
d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
e. Expansion (control) joint.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

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 setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

A. General: 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.

1. Laminating adhesive shall have a VOC content of 50 g/L or less).
2. Laminating adhesive shall comply with the testing and product requirements of 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. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 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 C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

E. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

B. Comply with ASTM C 840.

C. 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.

D. Prefill open joints and damaged surface areas.

E. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

F. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for acoustical tile.
3. Level 3: Behind permanent cabinetry.

a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

4. Level 5: At all other locations.

a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.2 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 093000 - TILING

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. Floor tile.
   2. Glazed wall tile. (see finish schedule and interior elevations)
   3. Glazed tile cove base (see Finish Schedule)
   4. Waterproof membrane for thin-set tile installations.
   5. Crack-suppression membrane for thin-set tile installations.
   6. Metal edge strips installed as part of tile installations.

B. Related Sections include the following:
   1. Division 03 Section "Cast-in-Place Concrete" for monolithic slab finishes specified for tile substrates.
   2. Division 09 Section "Gypsum Board" for water-resistant gypsum board.
   3. Division 09 Section “Portland Cement Plaster” for tile scheduled to be thinset over cement plaster substrates.

1.3 DEFINITIONS

A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.

B. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

1.4 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

   1. Level Surfaces: Minimum 0.6.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

C. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.

D. Samples for Verification:

1. Full-size units of each type and composition of tile and for each color and finish required.
2. Assembled samples with grouted joints for each type and composition of tile and for each color and finish required, at least 12 inches (300 mm) square and mounted on rigid panel. Use grout of type and in color or colors approved for completed work.
3. Full-size units of each type of trim and accessory for each color and finish required.
4. Stone thresholds in 6-inch (150-mm) lengths.
5. Metal edge strips in 6-inch (150-mm) lengths.

E. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

F. Product Certificates: For each type of product, signed by product manufacturer.

G. Qualification Data: For Installer.

1.6 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain all tile of same type and color or finish from one source or producer.

1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:

1. Joint sealants.
2. Metal edge strips.

D. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
1. Build mockup of each type of wall tile installation.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store liquid latexes in unopened containers and protected from freezing.

E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

5. Basis-of-Design Product: The design for each tile type is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.

C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:

1. Match Architect's samples.

D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.

1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.3 TILE PRODUCTS

A. Manufacturers:

1. American Marazzi Tile, Inc.
2. American Olean; Div. of Dal-Tile International Corp.
3. Apollo Tile (at Home Depot)
4. Buchtal Corporation USA.
5. Cerim-Floor Gres Ceramiche.
6. Crossville Ceramics Company, L.P.
7. Daltile; Div. of Dal-Tile International Inc.
8. Florida Tile Industries, Inc.
9. GranitiFiandre.
10. Interceramic.
11. KPT, Inc.

12. Laufen USA.
13. Lone Star Ceramics Company.
14. Metropolitan Ceramics.
15. Monarch Tile, Inc.
16. Porcelanite, Inc.
17. As Specified on Plans

B. ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.

C. Glazed Ceramic Tile: Floor tile as follows:

1. Composition: Porcelain

2. Product Name: Apollo: Citadel Sephia Brown Floor Tile
3. Module Size: 17.42” x 17.42”
4. Thickness: per manufacturer
5. Face: Plain with cushion edges.
6. Finish: Matte, opaque glaze.

D. Glazed Wall Tile: Flat tile as follows:

1. Module Size: 4-1/4 by 12-1/4 inches (108 by 108 mm).
2. Thickness: 5/16 inch (8 mm).
3. Face: Owner to select.
4. Finish: Bright, opaque glaze.

E. Glazed Wall Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing where applicable.

1. Base: Coved, module size 6 by 6 inches (152 by 152 mm).
2. Wainscot Cap: Bullnose
3. External Corners: Bullnose
4. Internal Corners: Field-butted square corners except with coved base and cap angle pieces designed to fit with stretcher shapes.

F. Glazed Wall Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing of adjoining flat tile where applicable. Provide shapes as follows, selected from manufacturer's standard shapes:

1. Base for Portland Cement Mortar Installations: Coved, module size 4-1/4 by 4-1/4 inches (108 by 108 mm).
2. Base for Thin-Set Mortar Installations: Straight, module size 4-1/4 by 4-1/4 inches (108 by 108 mm).
3. Wainscot Cap for Portland Cement Mortar Installations: Bullnose cap, module size 4-1/4 by 4-1/4 inches (108 by 108 mm)
4. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose, module size 4-1/4 by 4-1/4 inches (108 by 108 mm).
5. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above.

6. External Corners for Portland Cement Mortar Installations: Bullnose shape with radius of at least 3/4 inch (19 mm), unless otherwise indicated.
7. External Corners for Thin-Set Mortar Installations: Surface bullnose.
8. Internal Corners: Field-butted square corners except with coved base and cap angle pieces designed to fit with stretcher shapes.

2.4 WATERPROOFING & CRACK-SUPPRESSION MEMBRANES FOR THIN-SET TILE INSTALLATIONS

A. General: Manufacturer's standard product that complies with ANSI A118.10**,** selected from the following.

B. Chlorinated-Polyethylene-Sheet Product: Nonplasticized, chlorinated polyethylene faced on both sides with high-strength, nonwoven polyester fabric, for adhering to latex-portland cement mortar; 60 inches (1524 mm) wide by 0.030-inch (0.76-mm) nominal thickness.

1. Product: Noble Company (The); Nobleseal TS.

C. PVC-Sheet Product: Two layers of PVC sheet heat-fused together and to facings of bondable nonwoven polyester, for adhering to latex-portland cement mortar; 60 inches (1524 mm) wide by 0.040-inch (1.01-mm) nominal thickness.

1. Product: Compotite Corporation; Composeal Gold.

D. Polyethylene-Sheet Product: Polyethylene faced on both sides with fleece webbing for adhering to latex-portland cement mortar; 39 inches (1000 mm) wide by 0.008-inch (0.203-mm) nominal thickness.

1. Product: Schluter Systems L.P.; KERDI.

E. Corrugated-Polyethylene Product: Corrugated polyethylene with dovetail-shaped corrugations for adhering to latex-portland cement mortar and with anchoring webbing on the underside; 39 inches (1000 mm) wide by 3/16-inch (4-mm) nominal thickness.

1. Product: Schluter Systems L.P.; DITRA.

F. Fabric-Reinforced, Modified-Bituminous-Sheet Product: Self-adhering SBS-modified-bituminous sheet with woven reinforcement facing for adhering to latex-portland cement mortar; 36 inches (914 mm) wide by 0.040-inch (1.01-mm) nominal thickness.

1. Product: National Applied Construction Products, Inc.; Strataflex.

G. Fabric-Reinforced, Fluid-Applied Product: System consisting of liquid-latex rubber and fabric reinforcement.

1. Products:

a. Custom Building Products; Trowel & Seal Waterproofing and Anti-Fracture Membrane.
b. LATICRETE International Inc.; Laticrete 9235 Waterproof Membrane.
c. MAPEI Corporation; PRP M19.

d. Summitville Tiles, Inc.; S-9000.

H. Unreinforced, Fluid-Applied Product: Liquid-latex rubber in a consistency suitable for trowel application and intended for use as waterproofing.

1. Products:

a. Boiardi Products Corporation; Elastiment 324.
b. Custom Building Products; LevelQuick Waterproofing and Anti-Fracture Membrane.
c. Jamo Inc.; Waterproof.

I. Latex-Portland Cement Product: Flexible mortar consisting of cement-based mix and acrylic-latex additive.

1. Products:

a. Boiardi Products Corporation; Elastiment 323.
b. MAPEI Corporation; PRP 315.
c. Southern Grouts & Mortars, Inc.; Southcrete 1100.
d. TEC Specialty Products Inc.; TA-324, Triple Flex.

J. Urethane Waterproofing and Tile-Setting Adhesive: One-part liquid-applied urethane**,** with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), in a consistency suitable for trowel application and intended for use as both waterproofing and tile-setting adhesive in a two-step process.

1. Products:

a. Bostik; Hydroment Ultra-Set.
b. Southern Grouts & Mortars, Inc.; Deck-Seal 1000.

2.5 SETTING AND GROUTING MATERIALS

A. Manufacturers:

1. Atlas Minerals & Chemicals, Inc.
2. Boiardi Products Corporation.
3. Bonsal, W. R., Company.
4. Bostik.
5. C-Cure.
6. Custom Building Products.
7. DAP, Inc.
8. Jamo Inc.
9. LATICRETE International Inc.
10. MAPEI Corporation.
11. Southern Grouts & Mortars, Inc.

12. Summitville Tiles, Inc.
13. TEC Specialty Products Inc.

B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:

1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.
2. Prepackaged dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive.

a. For wall applications, provide nonsagging mortar that complies with Paragraph F-4.6.1 in addition to the other requirements in ANSI A118.4.

C. Medium-Bed, Latex-Portland Cement Mortar: Provide materials composed as follows, with physical properties equaling or exceeding those required for thin-set mortars based on testing of medium-bed specimens according to ANSI A118.4:

1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.
2. Prepackaged dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive.

D. Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F (60 deg C) and 212 deg F (100 deg C), respectively, and certified by manufacturer for intended use.

E. Water-Cleanable, Tile-Setting Epoxy Adhesive: ANSI A118.3**,** with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. Chemical-Resistant Furan Mortar: ANSI A118.5, with carbon filler, unless otherwise indicated.

G. Organic Adhesive: ANSI A136.1, Type I, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

H. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate as required to produce color indicated.

I. Standard Sanded Cement Grout: ANSI A118.6, color as indicated.

J. Standard Unsanded Cement Grout: ANSI A118.6, color as indicated.

K. Polymer-Modified Tile Grout: ANSI A118.7, color as indicated.

1. Polymer Type: Ethylene vinyl acetate, in dry, redispersible form, prepackaged with other dry ingredients.

2. Polymer Type: Acrylic resin in liquid-latex form for addition to prepackaged dry-grout mix.
3. Polymer Type: Either ethylene vinyl acetate, in dry, redispersible form, prepackaged with other dry ingredients, or acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.

    a. Unsanded grout mixture for joints 1/8 inch (3.2 mm) and narrower.
    b. Sanded grout mixture for joints 1/8 inch (3.2 mm) and wider.

L. Chemical-Resistant Furan Grout: ANSI A118.5.

M. Grout for Pregrouted Tile Sheets: Same silicone rubber used in factory to pregrout tile sheets.

2.6 ELASTOMERIC SEALANTS

A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 07 Section "Joint Sealants."

1. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.

C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

1. Products:

    a. Dow Corning Corporation; Dow Corning 786.
    b. GE Silicones; Sanitary 1700.
    c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
    d. Tremco, Inc.; Tremsil 600 White.

D. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.

1. Products:

    a. Bostik; Chem-Calk 550.
    b. Mameco International, Inc.; Vulkem 245.
    c. Pecora Corporation; NR-200 Urexpan.
    d. Tremco, Inc.; THC-900.

E. Chemical-Resistant Sealants: For chemical-resistant floors, provide chemical-resistant elastomeric sealant of type recommended and produced by chemical-resistant mortar and grout manufacturer for type of application indicated, with proven service record and compatibility

with tile and other setting materials, and with chemical resistance equivalent to mortar/grout. Include primer and backer rod recommended by manufacturer.

2.7 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications, stainless steel; ASTM A 666, 300 Series exposed-edge material.
   1. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

D. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.

   1. Available Products:

      a. Bonsal, W. R., Company; Grout Sealer.
      b. Bostik; CeramaSeal Grout Sealer.
      c. C-Cure; Penetrating Sealer 978.
      d. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
      e. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
      f. TEC Specialty Products Inc.; TA-256 Penetrating Silicone Grout Sealer.

2.8 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.

1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
2. Remove protrusions, bumps, and ridges by sanding or grinding.

C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

D. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION, GENERAL

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.

C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.

F. Lay out tile wainscots to next full tile beyond dimensions indicated.

G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

H. Grout tile to comply with requirements of the following tile installation standards:

1. For ceramic tile grouts (sand-portland cement; dry-set, commercial portland cement; and latex-portland cement grouts), comply with ANSI A108.10.

I. At showers, tubs, and where indicated, install cementitious backer units and treat joints to comply with ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.4 CRACK-SUPPRESSION MEMBRANE INSTALLATION

A. Install crack-suppression membrane to comply with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.

3.5 WALL TILE INSTALLATION

A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.

B. Install metal lath and scratch coat for walls to comply with ANSI A108.1A, Section 4.1.

C. Joint Widths: Install tile on walls with the following joint widths:

1. Glazed Wall Tile: 1/16 inch (1.6 mm).

3.6 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove latex-portland cement grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

3.7 FLOOR TILE INSTALLATION SCHEDULE

3.8 WALL TILE INSTALLATION SCHEDULE

A. Tile Installation: Interior wall installation over sound, dimensionally stable masonry or concrete; thin-set mortar; TCA W202 and ANSI A108.5.

1. Tile Type: Glazed wall tile.
2. Thin-Set Mortar: Latex- portland cement mortar.
3. Grout: Polymer-modified unsanded grout.

END OF SECTION 093000

SECTION 095123 - ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes acoustical tiles in locations shown on reflected ceiling plan.

B. Related Sections:

1. Gypsum Board

2. HVAC

3. Electrical Work

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. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Evaluation reports.

C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to NVLAP.

B. 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 mockup of typical ceiling area as shown on Drawings.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 50 or less.

2.2 ACOUSTICAL TILE CEILINGS, GENERAL

A. Acoustical Tile Standard: Comply with ASTM E 1264.

B. Metal Suspension System Standard: Comply with ASTM C 635.

C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

2.3 ACOUSTICAL TILES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Armstrong World Industries, Inc. Fine Fissured, 746

B. Color: White

C. NRC: ASTM C 423. Classified with UL label on product carton, 0.55

D. CAC: ASTM C 1414; Classified with UL label on product carton, 35

E. AC: ASTM E 1111; Classified with UL label on product carton N/A

F. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.85.

G. Edge/Joint Detail: Beveled K4C4

H. Thickness: 5/8 inch (15 mm).

I. Modular Size: 12 by 12 inches (305 by 305 mm)

2.4 SUSPENSION SYSTEM: GLUE UP TO GYPSUM BOARD

1. acoustical adhesive is Henry #237 Acousti-Gum
2. If you prefer to use adhesive, follow directions on the adhesive packaging.
3. As the tile is pressed to the ceiling, the adhesive will spread and cover an area of approximately 3" across and 1/8" to 3/16" thick. Acoustical tile adhesive is recommended.
4. Do not "butter" too many tiles in advance, as a skin will form on the adhesive dabs and weaken the bond.
5. Level tile by inserting a 1/16" thick fiber spline approximately 3" long at each corner (works out to one spline for every tile.)
6. Use a 48" to 72" straight edge and press to the face of the installed tile to help level the ceiling.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install acoustical tile ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders, and comply with layout shown on reflected ceiling plans.

C. Arrange directionally patterned acoustical tiles as indicated on reflected ceiling plans.

END OF SECTION 095123

SECTION 096200 – RESILIENT FLOORING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Luxury Vinyl Tile Plank Flooring. Indicated as LVT Plank in the project finish schedule.

B. Related Sections: Section(s) related to this section include:
1. Concrete: Refer to Division 3 Concrete Sections for cast-in-place concrete, concrete toppings, and cementitious underlayments.
3. Resilient Flooring Accessories: Refer to Division 9 Finishes Sections for resilient wall bases, reducer strips, and other resilient flooring accessories.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM E 648 Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source.
2. ASTM E 662 Test Method for Specific Density of Smoke Generated by Solid Materials.
3. ASTM F 710 Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.
4. ASTM F 970 Test Method for Static Load Limit.

B. National Fire Protection Association (NFPA):
1. NFPA 253 Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source.
2. NFPA 258 Test Method for Specific Density of Smoke Generated by Solid Materials.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements: Provide flooring which has been manufactured, fabricated and installed to performance criteria certified by manufacturer without defects, damage, or failure.

1.04 SUBMITTALS

A. General: Submit listed submittals in accordance with "Conditions of the Contract" and Division 1 Submittal Procedures Section.

B. Product Data: Submit product data, including manufacturer's SPEC-DATA product sheet, for specified products.

C. Samples: Submit selection and verification samples for finishes, colors, and textures.

D. Quality Assurance Submittals: Submit the following:
    1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
    2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.
    3. Manufacturer's Instructions: Manufacturer's installation instructions.

E. Closeout Submittals: Submit the following:
    1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to

    finishes and performance.
    2. Warranty: Warranty documents specified herein.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
    1. Engage installer certified as an “Associate Mechanic” or "Master Mechanic."
    2. Certificate: Submit certificate indicating qualification.

B. Regulatory Requirements:
1. Fire Performance Characteristics: Provide resilient linoleum tile flooring with the following fire performance characteristics as determined by testing products in accordance with ASTM method indicated below by a certified testing laboratory or another testing and inspecting agency acceptable to authorities having jurisdiction:
        a. Critical Radiant Flux: Class 1 Rating per NFPA 253 (ASTM 648) (0.45 watts/cm² or greater).
        b. Smoke Density: Less than 450 per NFPA 258 (ASTM E 662).

C. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings) Section.

D. Pre-Installation Testing: Conduct pre-installation testing for moisture content in slab prior to installation and to ensure moisture levels are below thresholds allowed by manufacturer prior to installation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with Division 1 Product Requirements Sections.

B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.

1. Material should be stored in areas that are fully enclosed, weathertight with the permanent HVAC system set at a uniform temperature of at least 68 degrees F (20 degrees C) for 48 hrs. prior to, during and after installation.

1.07 PROJECT CONDITIONS

A. Environmental Requirements/Conditions: In accordance with manufacturer's recommendations, Areas to receive flooring should be clean, fully enclosed and weathertight with the permanent HVAC system operational and set at a minimum of 68° F (20° C) for a minimum of 7 days prior to, during, and 7 days after the installation. The flooring material should be conditioned in the same manner for at least 48 hours prior to the installation. Maximum temperature should not exceed 100 degrees F after installation. Areas to receive flooring shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the flooring, and for final inspection.

B. Temperature Requirements: Maintain air temperature in spaces where products will be installed for time period before, during, and after installation as recommended by manufacturer.

1. Temperature Conditions: 68 degrees F (20 degrees C) for 7 days prior to, during and after installation.

C. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.08 SEQUENCING AND SCHEDULING

A. Finishing Operations: Install tile flooring after finishing operations, including painting and ceiling operations, have been completed.

B. Concrete Curing: Do not install tile flooring over concrete substrates until substrates have cured and are dry to bond with adhesive as determined by resilient flooring manufacturer's recommended bond, moisture test, and pH test.

1.09 WARRANTY

A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

1. Warranty Period: Five (5) year limited warranty commencing on Date of Substantial Completion.

1.10 MAINTENANCE

A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals (Maintenance Materials) Section.

1. Quantity: Furnish quantity of flooring units equal to 5% of amount installed.
2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.

PART 2 - PRODUCTS

2.01 LUXURY VINYL TILE

A. Basis of Design– Luxury Vinyl Tile:
1. Duralux, Waterproof Rigid Core Luxury Vinyl Plank: Platinum Harvest

B. Substitutions: Not permitted.

2.2 ACCESSORIES

2.2.1 Reducer Strips: Solid vinyl or rubber composition, 1 inch wide by flooring thickness, tapered, color to be selected from manufacturer's full color range.

2.2.2 Leveling Compound: White, premixed, latex based.

2.2.3 Adhesive:
2.2.3.1 Water based, waterproof, recommended by flooring manufacturer.

2.2.4 Grounding Tape: 1/2 inch wide copper tape.

2.02 PRODUCT SUBSTITUTIONS

A. Substitutions: Per criteria outlined in Specification Section 01300

2.03 RELATED MATERIALS

A. Related Materials: Refer to other sections for related materials as follows:
2. Resilient Flooring Accessories: Refer to Division 9 Finishes Sections for resilient flooring accessories.

2.04 SOURCE QUALITY

A. Source Quality: Obtain flooring product materials from a single manufacturer.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions for installation.

3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions.

B. Material Inspection: In accordance with manufacturer's installation requirements, visually inspect materials prior to installation. Material with visual defects shall not be installed. Labor costs required to replace material installed with visual defects shall be the responsibility of the installation contractor.

3.03 PREPARATION

A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

B. Surface Preparation:
1. General: Prepare floor substrate in accordance with manufacturer's instructions.
2. Floor Substrate: Prepare floor substrate to be smooth, rigid, flat, permanently dry, clean and free of foreign materials such as dust, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue.
3. Concrete Floor Substrate: Concrete floor substrate shall have a minimum compressive strength of 3500 psi. Refer to Division 3 Concrete sections for patching and repairing crack materials, and leveling compounds with portland cement-based compounds.

a. Reference Standard: Comply with ASTM F 710 Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.

C. Concrete Moisture Testing: Conduct moisture tests on all concrete floors regardless of the age, grade level or the presence of existing flooring. Conduct calcium chloride tests in accordance with ASTM F 1869. Measure the internal relative humidity of the concrete slab in accordance with ASTM F 2170. One test of each type should be conducted for every 1,000 sq. ft. of flooring. For projects less than 3,000 sq. ft., a minimum of three tests of each type should be conducted. The tests should be conducted around the perimeter of the room, at columns, and where moisture may be evident. Concrete moisture vapor emissions must not exceed 5.0 lbs. per 1,000 sq. ft. in 24 hrs. Concrete internal relative humidity must not exceed 75%. A diagram of the area showing the location and results of each test should be submitted to the Architect, General Contractor or End User. If any test result exceeds these limitations, the installation must not proceed until the problem has been corrected.

D. Concrete pH Test: Perform pH tests on concrete floors regardless of the age or grade level. If the pH is greater than 10, it must be neutralized prior to beginning the installation.

3.04 INSTALLATION

A. Full Spread Adhesive Method Installation: Install tile flooring with full spread adhesive method from established area center marks, in order for tile at opposite edges of area to be of equal width. Avoid using cut tile widths at perimeter less than four inches of tile width. Install tiles square with room axis. Lay tile material into wet adhesive, as recommended by tile manufacturer.
1. Full Spread Adhesive Method, Seamless Flooring Installation: Rout out seams and heat weld together with complementary colored heat welding rod in accordance with flooring manufacturer's recommendations.

2. Adhesive Material Installation: Use trowel as recommended by flooring manufacturer for specific type of adhesive. Spread at a rate of approximately 150 sq. ft./gal. as recommended by flooring manufacturer.

B. Installation Techniques:
1. Square with room axis.
2. Where demountable partitions and other items are indicated for installation on top of finished flooring, install flooring before these items are installed.
3. Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures and built-in furniture, including pipes, outlets, edgings, thresholds, nosings, and cabinets.
4. Extend flooring into toe spaces, door reveals, closets, and similar openings.
5. Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on covers.
6. Do not install resilient flooring over expansion joints. Use expansion joint covers manufactured for use with resilient flooring. Refer to other specifications sections for expansion joint covers.
7. Adhere resilient flooring to flooring substrate without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed flooring installation.
a. Use adhesive applied to substrate in compliance with flooring manufacturer’s recommendations, including those for trowel notching, adhesive mixing, and adhesive open and working times.
8. Roll resilient flooring as required by flooring manufacturer.

C. Finish Flooring Patterns: As selected by Architect.

3.05 FIELD QUALITY REQUIREMENTS

A. Manufacturer's Field Services: Upon Architect’s request and with at least 72 hours notice, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.
1. Site Visits: Two visit – one for pre-installation and one at completion of installation.

3.06 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.
1. Remove visible adhesive and other surface blemishes using cleaning methods recommended by tile floor manufacturer.
2. Sweep and vacuum floor after installation.
3. Do not wash floor until after time period recommended by flooring manufacturer.
4. Damp-mop flooring to remove black marks and soil.

3.07 PROTECTION

A. Protection: Protect installed product and finish surfaces from damage during construction. Remove and legally dispose of protective covering at time of Substantial Completion.

END OF SECTION 096520

SECTION 096513 - 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. Resilient base.
2. Resilient stair accessories.
3. Resilient molding accessories.

B. Related Sections:

1. Division 09 Section "Resilient Sheet Flooring" for resilient sheet floor coverings.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of product indicated.

C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches Long, of each resilient product color, texture, and pattern required.

D. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Mockups: Provide resilient products with mockups specified in other Sections.

1.5 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 or more than 90 deg F .

1.6 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F , in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F .

C. Install resilient products after other finishing operations, including painting, have been completed.

1.7 EXTRA MATERIALS

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 for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

A. Resilient Base:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Flexco, Inc.
   b. Johnsonite.
   c. Roppe Corporation, USA.

B. Resilient Base Standard: ASTM F 1861.

1. Material Requirement: Type TP (rubber, thermoplastic)
2. Manufacturing Method: Group I (solid, homogeneous)
3. Style: Cove (base with toe).

C. Minimum Thickness: 1/8 inch (3.2 mm)

D. Height: 4 inches (102 mm)

E. Lengths: Cut lengths 48 inches (1219 mm) long or coils in manufacturer's standard length.

F. Outside Corners: Job formed or preformed.

G. Inside Corners: Job formed or preformed.

H. Finish: As selected by Architect from manufacturer's full range.

I. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 RESILIENT MOLDING ACCESSORY

A. Resilient Molding Accessory:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Flexco, Inc.
   b. Johnsonite.
   c. Roppe Corporation, USA.

B. Description: Transition strips

C. Material: Rubber.

D. Profile and Dimensions: As indicated.

E. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

   a. Cove Base Adhesives: Not more than 50 g/L.
   b. Rubber Floor Adhesives: Not more than 60 g/L.

C. Stair-Tread-Nose Filler: Two-part epoxy compound recommended by resilient tread manufacturer to fill nosing substrates that do not conform to tread contours.

D. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.

E. Floor Polish: Provide protective liquid floor polish products as recommended by resilient stair tread manufacturer.

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.

B. 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.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Treads and Accessories: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
4. Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

    a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
    b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until they are same temperature as the space where they are to be installed.

1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

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.

C. Install resilient base in lengths as long as practicable 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. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.

3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products until Substantial Completion.

END OF SECTION 096513

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Concrete.
2. Steel.
3. Galvanized metal.
4. Wood.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each finish and for each color and texture required.

C. Product List: Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.3 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.

B. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

PART 2 - PRODUCTS

2.1 PAINT, 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 manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.

2.2 PRIMERS/SEALERS

A. Alkali-Resistant Primer: MPI #3.

1. VOC Content: E Range of E2.

B. Bonding Primer (Water Based): MPI #17.

1. VOC Content: E Range of E2.

C. Bonding Primer (Solvent Based): MPI #69.

1. VOC Content: E Range of E2.

D. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint system indicated.

2.3 METAL PRIMERS

A. Alkyd Anticorrosive Metal Primer: MPI #79.

1. VOC Content: E Range of E2.

B. Quick-Drying Alkyd Metal Primer: MPI #76.

1. VOC Content: E Range of E2.

C. Cementitious Galvanized-Metal Primer: MPI #26.

1. VOC Content: E Range of E1.

D. Waterborne Galvanized-Metal Primer: MPI #134.

1. VOC Content: E Range of E2.
2. Environmental Performance Rating: EPR 2.

E. Quick-Drying Primer for Aluminum: MPI #95.

1. VOC Content: E Range of E2.

2.4 WOOD PRIMERS

A. Exterior Latex Wood Primer: MPI #6.

1. VOC Content: E Range of E2.

B. Exterior Oil Wood Primer: MPI #7.

1. VOC Content: E Range of E2.

2.5 EXTERIOR LATEX PAINTS

A. Exterior Latex (Flat): MPI #10 (Gloss Level 1).

1. VOC Content: E Range of E2.

B. Exterior Latex (Semigloss): MPI #11 (Gloss Level 5).

1. VOC Content: E Range of E2.

C. Exterior Latex (Gloss): MPI #119 (Gloss Level 6, except minimum gloss of 65 units at 60 deg).

1. VOC Content: E Range of E2.

2.6 EXTERIOR ALKYD PAINTS

A. Exterior Alkyd Enamel (Flat): MPI #8 (Gloss Level 1).

1. VOC Content: E Range of E1.

B. Exterior Alkyd Enamel (Semigloss): MPI #94 (Gloss Level 5).

1. VOC Content: E Range of E2.

C. Exterior Alkyd Enamel (Gloss): MPI #9 (Gloss Level 6).

1. VOC Content: E Range of E2.

2.7 QUICK-DRYING ENAMELS

A. Quick-Drying Enamel (Semigloss): MPI #81 (Gloss Level 5).

1. VOC Content: E Range of E2.

B. Quick-Drying Enamel (High Gloss): MPI #96 (Gloss Level 7).

1. VOC Content: E Range of E2.

2.8 TEXTURED AND HIGH-BUILD COATINGS

A. Latex Stucco and Masonry Textured Coating: MPI #42.

1. VOC Content: E Range of E2.

B. High-Build Latex (Exterior): MPI #40.

1. VOC Content: E Range of E3.

2.9 ALUMINUM PAINT

A. Aluminum Paint: MPI #1.

1. VOC Content: E Range of E2.

2.10 FLOOR COATINGS

A. Interior/Exterior Clear Concrete Floor Sealer (Water Based): MPI #99.

1. VOC Content: E Range of E2.

B. Interior/Exterior Clear Concrete Floor Sealer (Solvent Based): MPI #104.

1. VOC Content: E Range of E2.

C. Interior/Exterior Latex Floor and Porch Paint (Low Gloss): MPI #60 (maximum Gloss Level 3).

1. VOC Content: E Range of E2.
2. Environmental Performance Rating: EPR 3.

D. Exterior/Interior Alkyd Floor Enamel (Gloss): MPI #27 (Gloss Level 6).

1. VOC Content: E Range of E2.
2. Additives: Manufacturer's standard additive to increase skid resistance of painted surface.

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 Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Wood: 15 percent.
4. Plaster: 12 percent.
5. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION AND APPLICATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

C. 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.

D. 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.

E. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.3 EXTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System: MPI EXT 3.1A.

a. Prime Coat: Exterior latex matching topcoat.
b. Intermediate Coat: Exterior latex matching topcoat.
c. Topcoat: Exterior latex semigloss.

2. Latex Aggregate/Latex System: MPI EXT 3.1 B.

a. Prime Coat: Latex stucco and masonry textured coating.
b. Intermediate Coat: Exterior latex matching topcoat.
c. Topcoat: Exterior latex semigloss.

3. High-Build Latex System: MPI EXT 3.1L, applied to form dry film thickness of not less than 10 mils (0.25 mm).

a. Prime Coat: As recommended in writing by topcoat manufacturer.
b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
c. Topcoat: High-build latex (exterior).

4. Latex Aggregate System: MPI EXT 3.1N.

a. Prime Coat: As recommended in writing by topcoat manufacturer.
b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
c. Topcoat: Latex stucco and masonry textured coating.

B. Concrete Substrates, Traffic Surfaces:

1. Clear Sealer System: MPI EXT 3.2G.

a. Prime Coat: Interior/exterior clear concrete floor sealer (solvent based).
b. Intermediate Coat: Interior/exterior clear concrete floor sealer (solvent based).
c. Topcoat: Interior/exterior clear concrete floor sealer (solvent based).

2. Water-Based Clear Sealer System: MPI EXT 3.2H.

a. Prime Coat: Interior/exterior clear concrete floor sealer (water based).
b. Intermediate Coat: Interior/exterior clear concrete floor sealer (water based).
c. Topcoat: Interior/exterior clear concrete floor sealer (water based).

C. Steel Substrates:

1. Quick-Drying Enamel System: MPI EXT 5.1A.

a. Prime Coat: Quick-drying alkyd metal primer.
b. Intermediate Coat: Quick-drying enamel matching topcoat.
c. Topcoat: Quick-drying enamel high gloss.

D. Galvanized-Metal Substrates:

1. Latex System: MPI EXT 5.3A.

    a. Prime Coat: Cementitious galvanized-metal primer.
    b. Intermediate Coat: Exterior latex matching topcoat.
    c. Topcoat: Exterior latex semigloss.

2. Latex Over Water-Based Primer System: MPI EXT 5.3H.

    a. Prime Coat: Waterborne galvanized-metal primer.
    b. Intermediate Coat: Exterior latex matching topcoat.
    c. Topcoat: Exterior latex semigloss.

E. Glue-Laminated Beam and Column Substrates:

1. Latex System: MPI EXT 6.1L.

    a. Prime Coat: Exterior latex wood primer.
    b. Intermediate Coat: Exterior latex matching topcoat.
    c. Topcoat: Exterior latex semigloss.

F. Dressed Lumber Substrates: Including architectural woodwork

1. Latex System: MPI EXT 6.3L.

    a. Prime Coat: Exterior latex wood primer.
    b. Intermediate Coat: Exterior latex matching topcoat.
    c. Topcoat: Exterior latex semigloss.

G. Dimension Lumber Substrates, Nontraffic Surfaces:

1. Latex System: MPI EXT 6.2M.

    a. Prime Coat: Exterior latex wood primer.
    b. Intermediate Coat: Exterior latex matching topcoat.
    c. Topcoat: Exterior latex semigloss.

H. Dimension Lumber Substrates, Traffic Surfaces: Including lumber trellis.

1. Latex System: MPI EXT 6.5E.

    a. Prime Coat: Exterior latex wood primer.
    b. Intermediate Coat: Interior/exterior latex floor and porch (low gloss).
    c. Topcoat: Interior/exterior latex floor and porch (low gloss).

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Concrete.
2. Steel.
3. Galvanized metal.
4. Aluminum (not anodized or otherwise coated).
5. Wood.
6. Gypsum board.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each finish and for each color and texture required.

C. Product List: Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.3 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

B. Mockups: Apply benchmark samples 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 specified in Part 3.

a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
b. Other Items: Architect will designate items or areas required.

2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
3. Final approval of color selections will be based on benchmark samples.

a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. 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.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base:

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Dry-Fog Coatings: 400 g/L.
4. Primers, Sealers, and Undercoaters: 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Floor Coatings: 100 g/L.
9. Shellacs, Clear: 730 g/L.
10. Shellacs, Pigmented: 550 g/L.

D. 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 manufacturers of topcoat for use in paint system and on substrate indicated.

3. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
4. Restricted Components: 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.

E. Colors: As selected by Architect from manufacturer's full range.

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 Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Wood: 15 percent.
4. Gypsum Board: 12 percent.
5. Plaster: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION AND APPLICATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

C. 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.

D. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:

1. Mechanical Work:

a. Uninsulated metal piping.
b. Uninsulated plastic piping.
c. Pipe hangers and supports.
d. Tanks that do not have factory-applied final finishes.
e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

2. Electrical Work:

a. Switchgear.
b. Panelboards.
c. Electrical equipment that is indicated to have a factory-primed finish for field painting.

E. 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.

F. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.3 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System: MPI INT 3.1E.

a. Prime Coat: Interior latex matching topcoat.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex gloss.

2. Latex Over Sealer System: MPI INT 3.1A.

a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex.

3. Latex Over Latex Aggregate System: MPI INT 3.1B.

a. Prime Coat: Latex stucco and masonry textured coating.
b. Intermediate Coat: Exterior latex matching topcoat.
c. Topcoat: Exterior latex gloss.

4. Clear Sealer System: MPI INT 3.2F.

a. First Coat: Interior/exterior clear concrete floor sealer (solvent based).
b. Topcoat: Interior/exterior clear concrete floor sealer (solvent based).

5. Water-Based Clear Sealer System: MPI INT 3.2G.

a. First Coat: Interior/exterior clear concrete floor sealer (water based).
b. Topcoat: Interior/exterior clear concrete floor sealer (water based).

B. Steel Substrates:

1. Quick-Drying Enamel System: MPI INT 5.1A.

a. Prime Coat: Quick-drying alkyd metal primer.
b. Intermediate Coat: Quick-drying enamel matching topcoat.
c. Topcoat: Quick-drying enamel high gloss.

C. Galvanized-Metal Substrates:

1. Latex Over Waterborne Primer System: MPI INT 5.3J.

a. Prime Coat: Waterborne galvanized-metal primer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex semigloss.

D. Glue-Laminated Beam and Column Substrates:

1. Latex System: MPI INT 6.1M.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex semigloss.

E. Dressed Lumber Substrates: Including architectural woodwork

1. Latex System: MPI INT 6.3T.

    a. Prime Coat: Interior latex-based wood primer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex **(**gloss**)**.

F. Dimension Lumber Substrates, Nontraffic Surfaces: Including exposed beams.

1. Latex System: MPI INT 6.2D.

    a. Prime Coat: Interior latex-based wood primer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex semigloss.

2. Latex Over Alkyd Primer System: MPI INT 6.2A.

    a. Prime Coat: Interior alkyd primer/sealer.

G. Gypsum Board Substrates:

1. Latex System: MPI INT 9.2A.

    a. Prime Coat: Interior latex primer/sealer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex low sheen.

END OF SECTION 099123

SECTION 101400 - 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. This Section includes the following:
   1. Dimensional characters.
   2. Panel signs.
   3. Photoluminescent signs.

B. Related Sections include the following:
   1. Division 26 Section "Interior Lighting" for illuminated Exit signs.

1.3 DEFINITIONS

2022 CBC, ADA 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."

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details for signs.

   1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
   2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.
   3. Wiring Diagrams: Power, signal, and control wiring.

C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available.

D. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:

   1. Plaque Casting: 6 inches (150 mm) square including border.
   2. Dimensional Characters: Full-size Samples of each type of dimensional character (letter, number, and graphic element).

3. Aluminum: For each form, finish, and color, on 6-inch- (150-mm-) long sections of extrusions and squares of sheet at least 4 by 4 inches (100 by 100 mm).
4. Acrylic Sheet: 8 by 10 inches (200 by 250 mm) for each color required.
5. Panel Signs: Not less than 12 inches (305 mm) square including border.

E. Sign Schedule: Use same designations indicated on Drawings.

F. Maintenance Data: For signs to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

C. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines .

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify recess openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 COORDINATION

A. For signs supported by or anchored to permanent construction, advise installers of anchorage devises about specific requirements for placement of anchorage. Provide anchorage to meet current CBC requirements and architects approval.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of metal and polymer finishes beyond normal weathering.

b. Deterioration of embedded graphic image colors and sign lamination Verify available warranties for units and components and insert number in subparagraph below.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum Castings: ASTM B 26/B 26M, of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.

B. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.

C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 6063-T5.

D. Brass Castings: ASTM B 584, Alloy UNS No. C85200 (high-copper yellow brass).

E. Bronze Castings: ASTM B 584, Alloy UNS No. C86500 (No. 1 manganese bronze).

F. Bronze Plate: ASTM B 36/B 36M.

G. Steel:
1. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529/A 529M or ASTM A 572/A 572M, 42,000-psi (290-MPa) minimum yield strength.
2. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness.

H. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

I. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils with pressure-sensitive adhesive backing, suitable for exterior applications.

J. Exterior Panel Signs (14 and 15/A8.8): Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:

1. Aluminum Sheet: 0.050 inch (1.27 mm) thick.
2. Edge Condition: Square cut.
3. Corner Condition: Rounded to ½” radius.
4. Mounting: Unframed.

a. Wall mounted.
b. Manufacturer's standard, noncorroding anchors for substrates encountered.

5. Custom Paint Colors: Match Pantone color matching system.
6. Color: As indicated.

K. Laminated Interior Room Signs (12/A8.8) for every room: Solid phenolic panel core with graphic image covered with thermosetting resin face layer.

1. Surface Finish: Mat.
2. Edge Condition: Square cut.
3. Corner Condition: Rounded to ½"radius.
4. Thickness: 1/4 inch (6 mm).

L. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square-cut edges free from burrs and cut marks; Braille dots with domed or rounded shape.

1. Panel Material: Opaque acrylic sheet.
2. Raised-Copy Thickness: Not less than 1/32 inch (0.8 mm).

M. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and are UV and water resistant for five years for application intended.

1. Color: As selected by Architect from manufacturer's full range.

2.2 PHOTOLUMINESCENT SIGNS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Evenlite Inc.
2. Holophane Corporation.
3. Isolite Corporation.
4. Johnsonite; Division of Duramax, Inc.

C. Photoluminescent Exit Signs: Self-contained, single or double face, as follows:

1. Manufacturer's standard plastic frame with translucent lettering and transparent polycarbonate face.
2. Exit sign, UL 924.
3. Mounting: As indicated.

a. Ceiling mounted with concealed anchors.

4. Face Color: Green.
5. Frame Color: As selected by Architect from manufacturer's full range.
6. Service Life: 20 years.

2.3 ACCESSORIES

A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.4 FABRICATION

A. General: Provide manufacturer's standard signs of configurations indicated.

1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.5 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. 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 the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 ALUMINUM FINISHES

A. Clear Anodic Finish: Manufacturer's standard Class 1 clear anodic coating, 0.018 mm or thicker, over a satin (directionally textured) mechanical finish, complying with AAMA 611.

B. Color Anodic Finish: Manufacturer's standard Class 1 integrally colored or electrolytically deposited color anodic coating, 0.018 mm or thicker, in medium bronze applied over a satin (directionally textured) mechanical finish, complying with AAMA 611.

2.7 ACRYLIC SHEET FINISHES

A. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five years for application intended.

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 work.

B. Verify that items including anchor inserts are sized and located to accommodate signs.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Interior Wall Signs: 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.

B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.

1. Two-Face Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
2. Hook-and-Loop Tapes: Mount signs to smooth, nonporous surfaces.
3. Magnetic Tape: Mount signs to smooth, nonporous surfaces.
4. Silicone-Adhesive Mounting: Attach signs to irregular, porous, or vinyl-covered surfaces.
5. Shim Plate Mounting: Provide 1/8-inch- (3-mm-) thick, concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other mounting methods are not practicable. Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach panel signs to plate using method specified above.

6. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

C. Bracket-Mounted Signs: Provide manufacturer's standard brackets, fittings, and hardware for mounting signs that project at right angles from walls and ceilings. Attach brackets and fittings securely to walls and ceilings with concealed fasteners and anchoring devices to comply with manufacturer's written instructions.

D. Dimensional Characters: Mount characters using standard fastening methods to comply with manufacturer's written instructions for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.
1. Projected Mounting: Mount characters at projection distance from wall surface indicated.

E. Cast-Metal Plaques: Mount plaques using standard fastening methods to comply with manufacturer's written instructions for type of wall surface indicated.

1. Concealed Mounting: Mount plaques by inserting threaded studs into tapped lugs on back of plaque. Set in predrilled holes filled with quick-setting cement.

3.3 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 101400

SECTION 102800 - TOILET, BATH, AND LAUNDRY 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. This Section includes the following:

1. Public-use washroom accessories.
2. Private-use bathroom accessories.
3. Underlavatory guards.
4. Custodial accessories.

B. Related Sections include the following:

1. Division 08 Section "Mirrors" for frameless mirrors.
2. Division 09 Section "Tiling" for ceramic toilet and bath accessories.
3. Division 09 Section “Gypsum Board Assemblies”.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Features that will be included for Project.
5. Manufacturer's warranty.

B. Samples: Full size, for each accessory item to verify design, operation, and finish requirements.

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 on Drawings.
2. Identify products using designations indicated on Drawings.

1.4 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same articles in Part 2, provide products of same manufacturer unless otherwise approved by Architect.

B. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 5 years documented experience.

C. Installer: Company specializing in performing Work of this section with minimum 3 years documented experience, and approved by the manufacturer.

1.5 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.

1.6 WARRANTY

A. Provide 5-year warranty under provisions of Division 1 Section “Product Requirements”.

B. Include coverage for corrosion and degradation of finish.

C. Include special warranty for degradation of silver finish on mirrors.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.

B. Brass: ASTM B 19 flat products; ASTM B 16 (ASTM B 16M), rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.0359inch (0.9-mm) minimum nominal thickness.

D. Galvanized Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.

E. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-andtheft resistant where exposed, and of galvanized steel where concealed.

G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.2 ACCESSORIES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: The design for accessories is based on products indicated. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. Bobrick Washroom Equipment, Inc.(stainless steel, No. 4, satin finish). Install where indicated on the drawings or per architects instruction in the field. Provide backing to install per CBC code and per manufacturers instructions
2. Or equal.

Toilet Rooms:

A. Bobrick B-3644 Recessed Waste Receptable,

B. Bobrick B-270 Contura Series Surface-Mounted Sanitary Napkin Disposal.

E. Bobrick B-6777/76777/6777 Surface-Mounted Towel Pin. (2) per Restroom & Quiet Room. (4) in Locker Room

F. Bobrick B-38032 Paper Towel Dispenser, Trimline series

G. Bobrick B-221 Toilet Seat Cover, Classic Series

H. American Specialties; 3200 Grab Bars

Mounting: Flanges with concealed fasteners
Material: Stainless steel, 0.05 inch thick.
Outside Diameter: 1 ½”
Configuration and length: As indicated on the drawings.

Utility Room:

I. (1) Bobrick B-287 Folding Utility Shelf,

J. (3) Bobrick B-6707-6777 Surface-Mounted Utility Hook.

K. (1) Bobrick B-224 Utility Shelf with Mop/Broom Holders and Rag Hooks.

2.3 UNDERLAVATORY GUARDS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: The design for accessories is based on products indicated. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. Plumberex Specialty Products, Inc.
2. TCI Products.
3. Truebro, Inc.

D. Underlavatory Guard

1. Basis-of-Design Product:
2. Description: Insulating pipe covering for supply and drain piping assemblies, that prevent direct contact with and burns from piping, and allow service access without removing coverings.
3. Material and Finish: Antimicrobial, molded-plastic, white.

2.4 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

SECTION 105500 - POSTAL SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. USPS-approved horizontal mail receptacle.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For postal specialties. Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each exposed product and for each color and texture specified.

D. Product certificates.

E. Maintenance data.

F. Other Informational Submittals: Final USPS local postmaster approval for installed postal specialties to be served by USPS.

1.3 QUALITY ASSURANCE

A. Source Limitations for Each Type of Postal Specialty: For USPS-approved products, use only those included on current lists of USPS manufacturers and models.

B. Preinstallation Conference: Conduct conference at Project site.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver lock keys to Owner by registered mail or overnight package service with a record of each corresponding lock and key number.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of postal specialties that fail in materials or workmanship within Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum: Manufacturer's standard alloy and temper for type of use and finish indicated.

B. Steel Sheet: Cold rolled, ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, exposed matte finish where exposed.

C. Metallic-Coated Steel Sheet: Galvanized-steel sheet, ASTM A 653/A 653M, G60 (Z180) coating designation, extra smooth where exposed; or electrolytic zinc-coated steel sheet, ASTM A 879/A 879M, Coating Designation 08Z (24G).

D. Stainless-Steel Sheet: ASTM A 666, Type 304.

E. Brass Sheet: ASTM B 36/B 36M, manufacturer's standard copper alloy.

F. Stainless-Steel Anchor Bolts, Nuts, and Washers: ASTM A 193/A 193M, Grade B8M, Type 316.

G. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.2 USPS-APPROVED HORIZONTAL MAIL RECEPTACLES

A. Front-Loading, USPS-Approved Horizontal Mail Receptacles within freestanding, pedestal-mounted enclosure. : Multiple compartments with fixed, solid compartment backs, enclosed within recessed wall box. Provide access to compartments for distributing incoming mail from front of unit by unlocking master lock and swinging side-hinged master door to provide accessibility to entire group of compartments. Provide access to each compartment for removing mail by swinging compartment door. Comply with USPS-B-1118F.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Salsbury Industries: 14.375” x 17.25” x 23” Mail Chest Model # 4350BLK with standard Ground Mount Pedestal Model 4385BLK

2. Front-Loading Master Door: Fabricated from extruded aluminum and braced and framed to hold compartment doors; prepared to receive master-door lock provided by local postmaster.
3. Compartment Doors: Fabricated from extruded aluminum. Equip each with lock and tenant identification as required by cited standard. Provide mail slot in the compartment with master-door lock.

   a. Compartment-Door Locks: Comply with USPS-L-1172C, PSIN O910, for locks and keys, or equivalent as approved by USPS; with three keys for each compartment door. Key each compartment differently.

4. Frames: Fabricated from extruded aluminum or aluminum sheet; ganged and nested units, with cardholder and blank cards for tenant's identification within each compartment.

5. Snap-on Trim: Fabricated from same material and finish as compartment doors.
6. Concealed Components and Mounting Frames: Aluminum or steel sheet with manufacturer's standard finish.
7. Exposed Aluminum Finish: Finish surfaces exposed to view as follows:

    a. Anodic Bronze Satin Finish: As selected by Architect from manufacturer's full range.

2.3 FABRICATION

A. Form postal specialties to required shapes and sizes, with true lines and angles, square, rigid, and without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges and corners free of sharp edges and burrs and safe to touch.

B. Preassemble postal specialties in shop to greatest extent possible to minimize field assembly.

C. Form joints exposed to weather to exclude water penetration.

D. Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating or by applying other permanent separation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Where dissimilar metals will be in permanent contact with each other, protect against galvanic action by painting contact surfaces with bituminous coating or by applying other permanent separation.
2. Where aluminum will contact grout, concrete, masonry, or wood, protect against corrosion by painting contact surfaces with bituminous coating.
3. Final acceptance of postal specialties depends on compliance with USPS requirements.

B. Pedestal-Mounted Horizontal Mail Receptacle: Install horizontal mail receptacles with center of tenant-door lock cylinders and bottom of compartments at the maximum and minimum heights above finished floor established by USPS and manufacturer's written instructions.

Anchor units with 1/2-inch- (13-mm-) diameter, stainless-steel anchor bolts with hooked ends.

C. Key Keeper: Install horizontally.

3.2 FIELD QUALITY CONTROL

A. Arrange for USPS personnel to examine and test postal specialties after they have been installed according to USPS regulations.

B. Obtain written final approval from USPS postmaster that authorizes mail collection for the served installation.

END OF SECTION 105500

SECTION 107500 - FLAGPOLES

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 ground-mounted flagpoles made from aluminum.

B. Owner-Furnished Material: Flag.

C. Related Sections:

1. Division 07 Section "Sheet Metal Flashing and Trim" for counterflashing flashing at roof-mounted flagpoles.
2. Division 26 Section "Lightning Protection for Structures" for connecting wall- and roofmounted metal flagpoles to lightning protection system.
3. Division 26 Section "Exterior Lighting" for site lighting fixtures.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand the effects of gravity loads, and the following loads and stresses within limits and under conditions indicated according to the following design criteria:

1. Seismic Loads: according to SEI/ASCE 7.
2. Wind Loads: according to NAAMM FP 1001, "Guide Specifications for Design of Metal Flagpoles.".
3. Base flagpole design on polyester flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

B. Shop Drawings: For flagpoles. Include plans, elevations, details, and attachments to other work. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.

1. Include section, and details of foundation system for ground-mounted flagpoles.

C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

D. Delegated-Design Submittal: For flagpole assemblies indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Include loads, point reactions, and locations for attachment of flagpoles to building's structure.

E. Qualification Data: For qualified professional engineer.

F. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain flagpole as complete unit, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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. Pole Tech. model PT306B, Commercial Groundset Flagpole

2.2 FLAGPOLES

A. Flagpole Construction, General: Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:

1. Fabricate shop and field joints without using fasteners, screw collars, or lead calking.
2. Provide flush hairline joints using self-aligning, snug-fitting, internal sleeves. B.

Exposed Height: 30 feet (9 m).

C. Aluminum Flagpoles: Provide cone-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 3/16 inch (4.8 mm).

D. Sleeve for Aluminum Flagpole: Fiberglass foundation sleeve, made to fit flagpole, for casting into concrete foundation.

1. Provide flashing collar of same material and finish as flagpole.

2.3 FITTINGS

A. Finial Ball: Manufacturer's standard flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

1. 0.063-inch (1.6-mm) spun aluminum, finished to match flagpole.

B. Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless-steel cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling. Provide flush access door secured with cylinder lock. Finish truck assembly to match flagpole.

1. Halyard Flag Snaps: Provide four bronze swivel snap hooks per halyard.

2.4 MISCELLANEOUS MATERIALS

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

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.

2.6 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A32/A34, Class II, 0.010 mm or thicker.

1. Color: Bronze.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, including foundation; accurate placement, pattern, orientation of anchor bolts, and other conditions affecting performance of the Work. B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.

B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.

D. Place concrete, as specified in Division 03 Section "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for not less than seven days or use nonstaining curing compound.

E. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.3 FLAGPOLE INSTALLATION

A. General: Install flagpoles where shown and according to manufacturer's written instructions.

B. Ground Set: Place sleeve, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level sleeve and allow concrete to cure. Install flagpole, plumb, in sleeve.

1. Foundation Tube: Place tube seated on bottom plate between steel centering wedges and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50-mm) layer of elastomeric joint sealant and cover with flashing collar.

2. Provide positive lighting ground for each flagpole installation.

END OF SECTION 107500

SECTION 114000 – EQUIPMENT & APPLIANCES

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 equipment for foodservice facilities indicated on the Drawings.

B. Owner-Furnished Equipment: Unless indicated otherwise, Contractor shall furnish and install all equipment. Where indicated that the Owner will furnish equipment items the Contractor shall install.

C. Related Sections include the following:

1. Division 05 Section "Metal Fabrications" for equipment supports.
2. Division 06 Section "Interior Architectural Woodwork" for custom casework and countertops.
3. Division 11 Section “Residential Appliances” for trash compactor and clothes washer and dryer.
4. Division 21, 22, and 23 Sections for supply and exhaust fans; exhaust ductwork; service roughing-ins; drain traps; atmospheric vents; valves, pipes, and fittings; fire-extinguishing systems; and other materials required to complete foodservice equipment installation.
5. Division 26 Sections for connections to fire alarm systems, wiring, disconnect switches, and other electrical materials required to complete foodservice equipment installation.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Manufacturer's model number.
2. Options, accessories, and components that will be included for Project.
3. Clearance requirements for access and maintenance.
4. Utility service connections for water, drainage, power, and fuel; include roughing-in dimensions.

B. Shop Drawings: For fabricated equipment. Include plans, elevations, sections, roughing-in dimensions, fabrication details, utility service requirements, and attachments to other work.
1. Wiring Diagrams: Details of wiring for power, signal, and control systems and differentiating between manufacturer-installed and field-installed wiring.

2. Piping Diagrams: Details of piping systems and differentiating between manufacturer-installed and field-installed piping.

C. Coordination Drawings: For food service facilities.

1. Indicate locations of foodservice equipment and connections to utilities.
2. Key equipment using same designations as indicated on Drawings.
3. Include plans and elevations; clearance requirements for equipment access and maintenance; details of support for equipment; and utility service characteristics.
4. Include details of seismic bracing for equipment.

D. Operation and Maintenance Data: For foodservice equipment to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Closeout Procedures, Operation and Maintenance Data," include the following:

1. Product Schedule: For each foodservice equipment item, include the following:

a. Designation indicated on Drawings.
b. Manufacturer's name and model number.
c. List of factory-authorized service agencies including their addresses and telephone numbers.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer to perform work for this Section who has specialized in installing food service equipment, who has completed installations similar in design and extent to that indicated for this Project, and who has a record of successful in-service performance.

B. Manufacturer Qualifications: Engage a firm experienced in manufacturing food service equipment similar to that indicated for this Project and with a record of successful in-service performance.

C. Source Limitations: Obtain each type of food service equipment through one source from a single manufacturer.

D. Product Options: Drawings indicate equipment based on the specific products indicated. Other manufacturers’ equipment with equal size and performance characteristics may be considered. Refer to Division 1 Section “Substitutions”

E. NSF Standards: Provide equipment that bears NSF Certification Mark or UL Classification Mark certifying compliance with applicable NSF/ANSI standards

F. UL Certification: Provide electric and fuel-burning equipment and components that are evaluated by UL for fire, electric shock, and casualty hazards according to applicable safety standards and that are UL certified for compliance and labeled for intended use.

G. Regulatory Requirements: Install equipment to comply with the following:

1. ASHRAE 15, "Safety Code for Mechanical Refrigeration."

2. NFPA 17, “Dry Chemical Extinguishing Systems”
3. NFPA 54, "National Fuel Gas Code."
4. NFPA 70, "National Electrical Code."
5. NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations."

H. Seismic Restraints: Comply with SMACNA's "Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines," Appendix A, "Seismic Restraint Details," unless otherwise indicated.

I. ANSI Standards: Comply with applicable ANSI Standards for electric-powered and gas-burning appliances; for piping to compressed-gas cylinders; and for plumbing fittings, including vacuum breakers and air gaps, to prevent siphonage in water piping.

J. SMACNA Standard: Where applicable, fabricate food service equipment to comply with the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) “Kitchen Equipment Fabrication Guidelines”, unless otherwise indicated.

K. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to food service equipment including, but not limited to, the following:
1. Review access requirements for equipment delivery.
2. Review equipment storage and security requirements.
3. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
4. Review structural loading limitations.
5. Review and finalize construction schedule and verify availability of materials, Installer’s personnel, equipment, and facilities needed to make progress and avoid delays.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver food service equipment as factory-assembled units with protective crating and covering.

B. Store food service equipment in original protective crating and covering and in a dry location.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions of food service equipment installation areas by field measurements before equipment fabrication and indicate measurements on Shop Drawings and Coordination Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish required dimensions and proceed with fabricating equipment without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.7 COORDINATION

A. Coordinate foodservice equipment layout and installation with other work, including power, lighting fixtures, HVAC equipment, and fire-suppression system components.

B. Coordinate location and requirements of utility service connections.

C. Coordinate size, location, and requirements of the following:

1. Overhead equipment supports.
2. Roof curbs, equipment supports, and penetrations.

1.8 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Manufacturer’s standard form in which manufacturer agrees to repair or replace appliance that fails in materials and workmanship within specified warranty period.
1. Range: Five-year limited warranty for in-home service on controls, oven and surface burner elements.
2. Hood: Five-year limited warranty for in-home service on motors and controls.
3. Refrigerator/Freezer: Five-year limited warranty on sealed refrigeration system and ice-maker components.
4. Dishwasher: Five-year warranty on controls, and against deterioration of tub, racks, and door liner.
5. Ice Machine: Five year warranty on ice maker components.
6. Microwave: Five year warranty.
7. Garbage disposal: Five year warranty.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Stainless Steel Janitor Room Sinks: AISI Type 304, hardest workable temper, No. 4 satin finish. Sink shall be manufactured of 16 US standard gauge stainless steel, Type 304

B. Stainless Steel Kitchen Sink (Break Room & Maintenance Office):
1. Sink shall be manufactured of 16 US standard gauge stainless steel, Type 304. AISI Type 304, hardest workable temper, No. 4 satin finish.

2. All sinks shall be deep drawn manufacturer's standard sizes or special sizes to be welded seamless. Sink bowls shall have 1-1/2" minimum radius coves at vertical and horizontal

corners and a 1/2" radius where bowl joins deck. Sink bowl shall be 19" x 32" x 12" with outlets for garbage disposer and drain specified in Plumbing Section and ledge for faucets as required for sink trim as specified. One piece welded construction; a "LAMI-WELD" joint shall be fused in the field, ground and polished to invisibility, free of warpage and distortions. All undersurfaces shall be coated with heat-resistant underseal for sound deadening and insulation from condensation. Coat with minimum 1/16" thick approved hard-drying mastic material. Spray onto surface after attachment sections are fastened to top. Completely cover and seal. Polish all exposed surfaces to a #4 Satin Finish.

C. Countertops shall be granite w/ backsplash to underside of cabinets. Sinks shall be undercounter mounted. Coordinate with electrical work and provide openings for all outlets and junction boxes.

D. Refrigerator/Freezer: Whirlpool Standard 29.58 cu. ft. 3 door, 36” wide with Ice Maker w/ Stainless Steel Finish Refrigerator/Freezer.

J. Microwave: Viking: Viking Professional: Conventional Microwave Oven – VMOS w/ stainless steel finish.

O. Garbage Disposer: Shall be "In-sink-erator" Model 777ss or equal, stainless steel, 1 HP/ Auto Reverse.

B. General: Provide all new materials, free from defects, of the brand and quality specified, or equal as approved by the Architect.

C. Materials: All materials shall be new and best of their respective kinds.

2.1 MISCELLANEOUS MATERIALS

A. Installation Accessories, General: NSF certified for end-use application indicated.

B. Elastomeric Joint Sealant: ASTM C 920; Type S (single component), Grade NS (nonsag), Class 25, Use NT (nontraffic) related to exposure, and Use M, G, A, or O as applicable to joint substrates indicated.

1. Public Health and Safety Requirements:

a. Sealant is certified for compliance with NSF standards for end-use application indicated.

b. Washed and cured sealant complies with the FDA's regulations for use in areas that come in contact with food.

2. Cylindrical Sealant Backing: ASTM C 1330, Type C, closed-cell polyethylene, in diameter larger than joint width.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install foodservice equipment level and plumb, according to manufacturer's written instructions.

1. Connect equipment to utilities.

B. Complete equipment assembly where field assembly is required.

1. Provide closed butt and contact joints that do not require a filler.
2. Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish.

C. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and requirements of authorities having jurisdiction.

D. Install joint sealant in joints between equipment and abutting surfaces with continuous joint backing, unless otherwise indicated. Produce airtight, watertight, vermin-proof, sanitary joints.

3.2 CLEANING AND PROTECTING

A. After completing installation of equipment, repair damaged finishes.

B. Clean and adjust equipment as required to produce ready-for-use condition.

C. Protect equipment from damage during remainder of the construction period.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain foodservice equipment. Refer to Division 01 Section "Closeout Procedures, Demonstration and Training."

END OF SECTION 114000

SECTION 122124 - SHADES

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Provide manually operated, sunscreen and blackout roller shades as applicable.

B. Provide electrically operated, sunscreen and blackout roller shades as applicable. Work includes local control system for direct control line voltage shade operation.

C. Provide and install shade system at the following locations:
   1. For the customer window in the Lobby provide EcoVeil 1350 Series (5% open) shades on Meco Slimline Bracket with SnapLoc Fascia.
   2. For all windows and Sliding Glass doors in the Conference Room: Mecho/5 DoubleShades with ThermoVeil® sunscreens with Blackout Shadecloth on a Single Bracket with SnapLoc® Fascia.
      a. Provide Manual Controls

D. Related Sections:

   1. Division 09 - Gypsum Board Assemblies: Coordination with gypsum board assemblies for blocking, installation of shade pockets, closures and related accessories.
   2.

1.2 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
   3. Storage and handling requirements and recommendations.
   4. Mounting details and installation methods.
   5. Typical wiring diagrams including integration of EDU controllers with building management system, audiovisual and lighting control systems as applicable.

B. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shade cloth samples and aluminum finish sample as selected. Mark face of material to indicate interior faces.

C. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

D. Warranty: Provide manufacturer's warranty documents as specified in this Section.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades system through one source from a single manufacturer with a minimum of ten years experience and minimum of five projects of similar scope and size in manufacturing products comparable to those specified in this section. This includes but is not limited to all required extrusions, accessories, controls and fabricated roller shades or else all stated and published warranties may be void.

B. Installer Qualifications: Engage an installer, which shall assume responsibility for installation of all system components, with the following qualifications.
   1. Installer for roller shade system shall be trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.

C.

D. Electrical Components: NFPA Article 100 listed and labeled by either UL or ETL or other testing agency acceptable to authorities having jurisdiction, marked for intended use, and tested as a system. Individual testing of components will not be acceptable in lieu of system testing. Where applicable, system components shall be FCC compliant.

E. Shadecloth Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, and ATCC9645.

F. PVC-Free Shadecloth: Comply with the following.
   1. Environmental Certification: Submit written certification from the manufacturer, including third party evaluation, recycling characteristics, and perpetual use certification as specified below. Initial submittals, which do not include the Environmental Certification, below will be rejected. Materials that are simply 'PVC free' without identifying their inputs shall not qualify as meeting the intent of this specification and shall be rejected.
   2. Recycling Characteristics: Provide documentation that the shade cloth can, and is part of a closed loop of perpetual use and not be required to be down cycled, incinerated or otherwise thrown away. Scrap material can be sent back to the mill for reprocessing and recycling into the same quality yarn and woven into new material, without down cycling. Certify that this process is currently underway and will be utilized for this project.
   3. Perpetual Use Certification: Certify that at the end of the useful life of the shade cloth, that the material can be sent back to the manufacturer for recapture as part of a closed loop of perpetual use and that the material can and will be reconstituted into new yarn, for weaving into new shade cloth. Provide information on each shade band indicating that the shade band can be sent back to the manufacturer for this purpose.

G. Requirements for Electronic Hardware, Controls, and Switches:
   1. Roller shade hardware, shade fabric, and all related controls shall be furnished and installed.

H. Mock-Up: Provide a mock-up, if Architect requires, of one roller shade assembly for evaluation of mounting, appearance and accessories.
   1. Locate mock-up in window designated by Architect.
   2. Do not proceed with remaining work until, mock-up is accepted by Architect.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver components in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Power and control wiring shall be complete and certified, fully operational with uninterrupted communication on the lines and minimal noise certified by a commissioning agent (engaged by others).
   1. 485, ICON, Lonmark and Dry Contract Network: Noise on the line not to exceed shade manufacturer's limits.

1.6 WARRANTY

A. Warranty: Provide manufacturer's standard warranties, including the following:
   1. Roller Shade Hardware, and Shadecloth: Manufacturer's standard non-depreciating twenty-five year limited warranty.
      a. EcoVeil standard non-depreciating 10-year limited warranty.
   2. Electronic Roller Shade EDU's and EDU Control Systems: Manufacturer's standard non-depreciating five-year warranty.
   3. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to access to the work above 12' Feet AFF, which are the responsibility of others.

   4.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Basis of Design Manufacturer for Window Shade System: Products by MechoSystems; 42-03 35th Street, Long Island City, NY 11101. Tel: (718) 729-2020 ext 1901; Mr. Glen Berman. Email: glenb@MechoSystems.com.

2.2 ELECTRIC CONTROLS

A. Use Standard switch to control high shades.

2.3 SHADE BANDS

A. Shade Bands: Construction of shade band includes the fabric, the enclosed hem weight, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
   1. Concealed Hembar: Shall be continuous extruded aluminum for entire width of shade band and with the following characteristics:
      a. Hembar shall be heat sealed on all sides.
      b. Open ends shall not be accepted.
   2. Shade Band and Shade Roller Attachment:

a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection.
b. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a “snap-on” snap-off” spline mounting, without having to remove shade roller from shade brackets.
c. Mounting Spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
d. Any method of attaching shade band to roller tube that requires the use of: adhesive, adhesive tapes, staples, and/or rivets, does not meet the performance requirements of this specification and shall not be accepted.

2.4 ROLLER SHADE FABRICATION

A. Fabricate shade cloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3.18 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design.

B. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shade bands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer’s standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

C. For railroaded shade bands, provide seams in railroaded multi-width shade bands as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Seams shall be properly located. Furnish battens in place of plain seams when the width, height, or weight of the shade exceeds manufacturer’s standards. In absence of such standards, assure proper use of seams or battens as required to, and assure the proper tracking of the railroaded multi-width shade bands

D. Provide battens for railroaded shades when width-to-height (W:H) ratios meet or exceed manufacturer’s standards. In absence of manufacturer’s standards, be responsible for proper use and placement of battens to assure proper tracking and roll of shade bands.

E. Blackout shade bands, when used in side channels, shall have horizontally mounted, roll-formed stainless steel or tempered-steel battens not more than 3 feet (115 mm) on center extending fully into the side channels. Battens shall be concealed in an integrally colored fabric to match the inside and outside colors of the shade band, in accordance with manufacturer’s published standards for spacing and requirements.
1. Battens shall be roll formed of stainless steel or tempered steel and concave to match the contour of the roller tube.

2.5 ROLLER SHADE COMPONENTS

A. Access and Material Requirements:
1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.

3. Use only Delran engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester shall not be accepted.

B. Motorized Shade Hardware and Shade Brackets:
   1. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel, or heavier, thicker, as required to support 150 percent of the full weight of each shade. Plastic components without use of steel angle construction do not meet the intent of this specification and shall not be accepted.

C. Manual Operated Chain Drive Hardware and Brackets:
   1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
   2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
   3. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
   4. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator, subject to manufacturer's design criteria. Connectors shall be offset to assure alignment from the first to the last shade band.
   5. Provide shade hardware system that allows multi-banded manually operated shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.
   6. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable.
   7. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
   8. Drive Bracket / Brake Assembly:
      a. MechoShade Drive Bracket model M5 shall be fully integrated with all MechoShade accessories, including, but not limited to: SnapLoc fascia, room darkening side / sill channels, center supports and connectors for multi-banded shades.
      b. M5 drive sprocket and brake assembly shall rotate and be supported on a welded 3/8 inch (9.525 mm) steel pin.
      c. The brake shall be an over running clutch design which disengages to 90 percent during the raising and lowering of a shade. The brake shall withstand a pull force of 50 lbs. (22 kg) in the stopped position.
      d. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly, which assures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable.
      e. The entire M5 assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.

9. Drive Chain: #10 qualified stainless steel chain rated to 90 lb. (41 kg) minimum breaking strength. Nickel plate chain shall not be accepted.

10. Shade Type WT-5: Motorized interior room darkening blackout roller shades in all exterior / interior windows of rooms and spaces as shown on referenced Drawings, and related EDU control requirements systems. Include the following as scheduled and as indicated on the Drawings:

2.6 SHADECLOTH

A. Room Darkening (PVC Free) Shadecloth with Opaque Acrylic Backing: MechoSystems, "Equinox 0100 series", .008 inches thick (.19 mm) blackout material and weighing .94 lbs. per square yard, comprising of 53% fiberglass, 45% acrylic, 2% poly finish.
   1. Color: Selected from manufacturer's standard colors.

B. Environmentally Certified Shadecloth: MechoSystems, EcoVeil group, 1350 or 1550 Series, fabricated from TPO for both core yarn and jacket, single thickness, 0.018 opaque coated reinforced yarn, non-raveling 0.030 inch (0.762 mm) thick fabric.

   1. Basket Weave: 5 percent open 2x2 basket weave
   2. Color: Selected from manufacturer's standard colors.
   3. Warranty: 10-Year Limited.

2.7 ROLLER SHADE ACCESSORIES

A. Fascia:
   1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
   2. Fascia shall be able to be installed across two or more shade bands in one piece.
   3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
   4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.

B. Room Darkening Side and Sill Channels:
   1. Extruded aluminum with polybond edge seals and SnapLoc-mounting brackets and with concealed fastening. Exposed fasting is not acceptable. Channels shall accept one-piece exposed blackout hembar with vinyl seal to assure side light control and sill light control.
      a. MechoSystems side channels, 1-15/16 inches (49.2 mm) wide by 1-3/16 inches (30.1 mm) deep, two-band center channels, 2-5/8 inches (66.6 mm) wide by 1-3/16 inches (30.1 mm) deep. The 2-5/8-inch (66.6 mm) double-center channels may be installed at center-support positions of multi-band-shade ElectroShades. MechoSystems side channels 2-5/8 inch (66.6 mm) may be used as center supports for ElectroShades; shade bands up to 8 high. For shade bands over 8 feet (2438 mm), provide ElectroShade side channels.
      b. ElectroShade side channels, 2-1/2 inches (63.5 mm) wide by 1-3/16 inches (30.1 mm) deep; two-band center channels 5 inches (127 mm) wide by 1-3/16 inches (30.1 mm) deep. The 2-5/8-inch (66.6 mm) double-center channels may be installed at center-support positions of multi-band-shade ElectroShades. MechoSystems side channels 2-5/8 inches (66.6 mm) may be used as center supports for ElectroShades. Also provide for use with manually operated room darkening MechoSystems's over 8 feet (2438 mm) in height.

c. Color: Selected from manufacturer's standard colors or custom color as selected by Architect.

PART 3 – EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 Turn-Key Single-Source Responsibility for Interior Roller Shades: To control the responsibility for performance of the electric roller shade system; assign the design, engineering, and installation of electronic drive roller shade control system, shades, addressable controls, communication interfaces, and any required sensors, switches and low voltage control wiring specified in this Section to the manufacturer of the shade and control system. The Architect will not produce a set of electrical drawings for the installation of control wiring for the electric roller shade control system.

A. General Contractor Responsibilities:
1. Provide power panels and circuits of sufficient size to accommodate roller shade manufacturer's requirements, as indicated on the mechanical and electrical drawings and manufacturer's shop drawings.
2. Coordinate with requirements of subcontractor for this section before inaccessible areas are constructed.
3. Coordinate requirements of ALSCS before inaccessible areas are constructed.
4. Provide conduit with pull wire in all areas, which might not be accessible to ALSCS due to building design, equipment location or schedule:
5. Coordinate with the main building electrical subcontractor to provide duplex 120 VAC power receptacle in Electric closet for floor/riser Communication Gateways.
6. Verify that wiring conditions, which have been previously installed under other sections or at a previous time, are acceptable for product installation in accordance with manufacturer's instructions.
7. Comply with manufacturer's product data, including shop drawings, technical bulletins, product catalog installation instructions, and product carton instructions for installation.
8. Protect installed product and finished surfaces from damage during all phases of installation including preparation, testing, and cleanup.
9. Be responsible for all other required electrical work including but not limited to roof penetrations, conduits, fireproofing, etc.
10. Provide conduit with pull wire in all areas, which might not be accessible to subcontractor due to building design, equipment location or schedule.

B. Window Covering Subcontractor (WC) Responsibilities:
1. Shade Control Subcontractor shall furnish and install shade controllers, interfaces, splitters, coupler, sensors, switches, junction boxes, etc mounted in the ceiling in an

accessible location. Locations for all visible devices to be coordinated with Architect. The shade control subcontractor shall inspect all material included in this contract prior to installation. Manufacturer shall be notified of unacceptable material prior to installation.

2. Line Voltage Wiring:
   a. WC to ROLLER SHADE EDU: The WC shall furnish and install power connection between Shade control system and EDU, and shall be capable of providing single line voltage wire pull for each EDU.

C. Shade Power Wiring (WC)
1. Shall furnish and install line voltage Cable from roller shade motor into line voltage side of control system.
2. Shall wire from General Contractor, provided, power junction box to each motor on the shade network.
3. Shall furnish and install a disconnect plug at the end of the power wiring run to each EDU. The disconnect plug must mate with a matching disconnect plug on the motor cable. EDU cable disconnect plug must be prefabricated by the manufacturer to meet UL and ETL systems requirements.

3.4 INSTALLATION OF ROLLER SHADES

A. Contractor Furnish and Install Responsibilities:
1. Window Covering Contractor (WC) shall provide an on site, Project Manager, and shall be present for all related jobsite scheduling meetings.
2. WC shall supervise the roller shade installation, and setting of intermediate stops of all shades to assure the alignment of the shade bands within a single EDU group, which shall not exceed +/- 0.125 inches (3.175mm), and to assure the alignment between EDU groups, which shall not exceed +/- 0.25 inches (6.35mm).
3. WC shall be responsible for field inspection on an area-by- area and floor-by-floor basis during construction to confirm proper mounting conditions per approved shop drawings.
4. Verification of Conditions: examine the areas to receive the work and the conditions under which the work would be performed and notify General Contractor and Owner of conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected. Commencement of installation shall constitute acceptance of substrate conditions by the installer.
5. WC shall provide accurate to 0.0625 inch (1.5875mm); field measurements for custom shade fabrication on the Roller Shades manufacturers input forms.
6. WC Installer shall install roller shades level, plumb, square, and true according to manufacturer’s written instructions, and as specified here in. Blocking for roller shades installed under the contract of the interior General Contractor shall be installed plumb, level, and fitted to window mullion as per interior architect’s design documents and in accordance with industry standard tolerances. The horizontal surface of the shade pocket shall not be out-of-level more than 0.625 inch (15.875mm) over 20 linear feet (6.096 meters)
7. Shades shall be located so the shade band is not closer than 2 inches (50 mm) to the interior face of the glass. Allow proper clearances for window operation hardware.
8. Adjust, align and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
9. Installer shall set Upper, Lower and up to 3 intermediate stop positions of all motorized shade bands, and assure alignment in accordance with the above requirements.

10. WC shall certify the operation of all motorized shades and turn over each floor for preliminary acceptance.
11. The WC shall participate and cooperate with the electrical contractor, the window shade manufacturer and the Commissioning agent to verify and certify the installation is in full conformance with the specifications and is fully operational. This work to occur during the commissioning stage and is in addition to preliminary acceptance required for each floor.
12. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
13. WC shall train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.
14. Protect installed products until completion of project.
15. Touch-up, repair or replace damaged products before Substantial Completion.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 123000 – GRANITE COUNTERTOPS

PART 1 - GENERAL

A. SCOPE:

This specification includes fabricated granite components required for the completion of granite work indicated by the contract documents.

This Section includes stone countertops. See Related Section 123530 for Residential Casework and Granite locations. Granite countertops for all residential casework.

B. Granite: MSI Granite Countertops: Sunset Canyon

1.2 DEFINITION OF TERMS

The definition of terms used in these specifications shall be those published by the National Building Granite Quarries Association, Inc.

1.2 SUBMITTALS

A. Product Data: All granite shall be obtained from quarries having adequate capacity and facilities to meet the specified requirements. Fabrication shall be by a firm equipped to process the material promptly in accordance with specifications. Evidence to this effect shall be provided by the supplier if required by the Design Professional.

B. Samples: Sufficient samples of granite shall be submitted to the Design Professional through the General Contractor.
1. Each sample set shall include three samples.
2. Sample set shall show anticipated range of color to be expected in the final installation. Natural variations in grain structure, inclusions or any other visual characteristic should also be included in the samples, or depicted in an accompanying photograph. In addition, a dated photograph may be issued to illustrate current quarry conditions.
3. Approved sample sets and/or mock up photographs with meeting minutes shall establish the standard by which stonework will be judged

1.3 SHOP DRAWINGS

A. Shop Drawings: The granite supplier shall submit: copies of required shop drawings to the Design Professional for approval. These drawings shall show all bedding, bonding, jointing and anchoring details, and the dimensions of each piece of granite. No final sizing or finishing shall be done until the shop drawings for that part of the work have been approved.

B. Samples: For each type of material exposed to view.

C. Defective Work: Any piece of granite showing manufacturing flaws upon receipt at the storage yard or building site shall be referred to the Design Professional for determination as to whether it shall be rejected, patched or redressed for use.

1.4 REFERENCES:

ASTM A 123: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
ASTM C 97: Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone.
ASTM C 119: Terminology Relating to Dimension Stone
ASTM C 170: Test Method for Compressive Strength of Dimension Stone
ASTM C 615: Specification for Granite Dimension Stone
ASTM C 880: Test Method for Flexural Strength of Dimensional Stone

PART 2 - MATERIALS

2.1 GRANITE

A. Granite Standard: Granite shall comply with ASTM C 615, “Standard Specification for Granite Dimension Stone” for material characteristics, physical requirements, and sampling for selection of granite.

GENERAL: All granite shall be of standard architectural grade, free of cracks, seams, or starts, which may impair its structural integrity or function. Color or other visual characteristics indigenous to the particular material and adequately demonstrated in the sampling or mock-up phases will be accepted provided they do not compromise the structural or durability capabilities of the material. Texture and finish shall be within the range of samples approved by the Design Professional.

B. Granite: The specifying party shall provide the following information for each different granite or finish required:

C. Dimensional Tolerance: Panel Thickness 3/4” to 1 5/8” (19 to 41 mm)

2.2 Flatness Tolerances.

Variation from true plane, or flat surfaces, shall be determined by a 4’ dimension in any direction on the surface. Such variations on polish, hone, and fine rubbed surfaces shall not exceed tolerances listed below or 1/3 of the specified joint width, whichever is greater. On surfaces having other finishes, the maximum variation from true plane shall not exceed the tolerance listed below or 1/2 of the specified joint width, whichever is greater.

Polished finishes.....1/16” (1.5 mm)
Sawn, 4-cut, 6-cut, and 8-cut finishes..... 1/8” (3 mm)

Thermal and coarse stippled finishes.....3/16” (5 mm)
Pointed or other rough cut finishes.....1” (25 mm)

2.3 Beds and Joints

1. Pieces shall be bedded and jointed as shown on the approved shop drawings, and bed and joint surfaces shall be cut as follows: 1. Bed and joint surfaces shall be sawn through the full thickness of the granite piece. Bed and joint surfaces shall be within ±3° of 90° to the face of the piece unless otherwise specified.

2. Beds and joints shall be sawn or cut full square 2” back from the face and from that point may fall under square not more than 1” in 12”. Both beds and joints shall be reasonably free of large depressions.

3. Beds and joints shall be split or rough sawn generally square with the face and may fall under square with the face not more than 2” in 12”.

2.4 Fabrication, General Requirements

A. Mouldings, washes and drips shall be constant in profile throughout their length, in strict conformity with details shown on approved shop drawings.
B. Dress joints straight and at 90 degree angle to face. Shape beds to fit supports.
C. Anchor Provision: Cut and drill sink provisions and holes in stone for anchors, fasteners, supports, and lifting devices as indicated or needed to set stone in place.
D. Allow room for expansion of the anchoring devices where necessary.
E. Where liners are required on the back of panels, secure by means of mechanical anchors. Comply with referenced standards.
F. Finish exposed faces and edges of stone, except sawed reveals, to comply with requirements indicated for finish and to match final samples and mockups.
G. Joint Width: Cut stone to produce uniform joints 3/8” or as shown on Drawings.
H. Provide chases, reveals, reglets, openings, and similar features as required to accommodate adjacent work.
I. Grade and mark stone to achieve uniform appearance when installed. Inspect finished stone units at fabrication plant. Replace defective units.

2.5 Incidental Cutting and Drilling

Panels in excess of 100 pounds (45 kg) may include, at installer’s option, lifting clamp dimples, Lewis holes, or other provisions as required to accommodate the lifting device(s) utilized by the installing contractor. Lifting holes in the top beds of panels or other locations where moisture collection is likely to occur shall be filled with non-expanding grout or high-modulus elastomeric sealant after installation and final alignment.

3. SHIPPING AND HANDLING

3.1 Packing and Loading

Finished granite shall be carefully packed and loaded for shipment using all reasonable and customary precautions against damage in transit. No material which may cause staining or discoloration shall be used for blocking or packing. Comment:

STAINING: Granite is highly resistant to staining, but should be protected from certain elements, such as wet (green) wood, oils, mud, rust, construction waste, and asphalt compounds. Contact supplier for proper remedies to staining problems that occur.

3.2 Site Storage
Upon receipt at the building site or storage yard, the granite shall be stacked on timber or platforms at least 3” above the ground, and extreme care shall be taken to prevent staining during storage. If storage is to be for a prolonged period, polyethylene or other suitable plastic film shall be placed between any wood and finished surfaces, and shall be used also as an overall protective covering. All holes shall be plugged during freezing weather to prevent the accumulation of water. Salt shall not be used for melting of ice formed in Lewis holes or on pieces, or for any purpose involving its contact with the granite.

4. STONE INSTALLATION

Proceed with the installation of the stonework in accordance with Drawings and using skilled mechanics capable of proper handling of the setting of the stone and able to field cut where necessary with sharp and true edges. Set stone with joints uniform in appearance and stone edges and faces aligned to tolerances indicated. Clean surfaces that are dirty or stained. Scrub with fiber brushes, and then rinse with clear water. Provide expansion, control, and pressure-relieving joints of widths and at locations shown on Drawings.

5. CLEANING AND PROTECTION

5.1 Cleaning Granite shall be shop cleaned at the time of final fabrication. After installation and pointing or caulking are completed, the contractor shall carefully clean the granite, removing all dirt, excess mortar, weld splatter, stains, and/or other site incident defacements. Stainless steel wire brushes or wool may be used, but the use of other wire brushes or of acid or other solutions which may cause discoloration is expressly prohibited. Fabricator should be contacted before cleaners other than detergents are used.

5.2 Protection of Finished Work After the granite work is installed, the granite shall be properly and adequately protected from damage. Boxing or other suitable protection shall be provided wherever required, but no lumber which may stain or deface the granite shall be used. All nails used shall be non-corrosive. All granite work in progress shall be protected at all times during construction by use of a suitable strong, impervious film or fabric securely held in place.

END OF SECTION 123530

SECTION 123530 - RESIDENTIAL CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Headquarters and Maintenance Building Cabinets. All Cabinet Boxes & bases to be constructed with Hardwood Plywood. Match Veneer to Cabinet Door and Drawer Fronts.
2. Cabinets and shelves in locations shown on plans and interior elevations to be constructed with hardwood face frame, Hardwood Cabinet Doors and Drawer fronts and Hardwood plywood cabinet boxes and bases. Hardwood face frames and Hardwood plywood veneer to match species selected by Owner for Cabinet Doors and Drawer fronts.
    a. Cabinet Countertops to be Granite
    (see spec 123640).

1.2 SUBMITTALS

A. Product Data: For cabinets**,** countertop material, and cabinet hardware.

B. Shop Drawings: For cabinets and countertops. Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, hardware, edge and backsplash profiles, methods of joining countertops, and cutouts for plumbing fixtures.

C. Samples: For each type of material exposed to view.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

B. Quality Standards: Unless otherwise indicated, comply with the following standards:

C. Manufacturer Qualifications: A manufacturer that is certified for chain of custody by an FSC-accredited certification body.

PART 2 - PRODUCTS

2.1 CABINET MATERIALS

A. General:

1. Adhesives and Composite Wood and Agrifiber Products: Do not use adhesives that contain urea formaldehyde.
2. Hardwood Lumber: Kiln dried to 7 percent moisture content.
3. Softwood Lumber: Kiln dried to 10 percent moisture content.
4. Hardwood Plywood: HPVA HP-1**,** made without urea formaldehyde.
5. Particleboard: ANSI A208.1, Grade M-2**,** made without urea formaldehyde.
6. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made without urea formaldehyde.
7. Hardboard: AHA A135.4, Class 1 Tempered.

B. Exposed Materials:
1. Plywood: Hardwood plywood with face veneer of species indicated, with Grade A faces and Grade C backs of same species as faces.

C. Concealed Materials: Solid wood or plywood, of any hardwood or softwood species, with no defects affecting strength or utility; particleboard; medium-density fiberboard; or hardboard.

2.2 CABINET HARDWARE

A. See Drawings for Cabinet Hinges and Drawer Pulls.(Owner to select from Manufactureres full range)

B. Heavy Duty Drawer Guides and Hinges: Epoxy-coated-metal, self-closing drawer guides; with soft closers; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05011 or Type B05091. Heavy Duty Drawer Glides 100 to 150 lb. capacity (or as called out in the cabinet details) with soft open and close feature.

C. General: Manufacturer's standard units complying with BHMA A156.9, of type, size, style, material, and finish as selected by Architect from manufacturer's full range.

2.3 COUNTERTOP & BACKSPLASH MATERIALS

A. Granite (see spec section 123640)

1. Plywood Base: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.4 CABINETS

A. Available Products: Subject to compliance with requirements, cabinets that may be incorporated into the Work include, but are not limited to, the following:

B. Products: Subject to compliance with requirements, provide one of the following:

C. Cabinet Style: Face Frame. Alder Select w/ satin finish (selected by Owner from Manufacturers full range.

D. Door and Drawer Fronts: **Oregon Cabinet Doors and Drawer Fronts: Raised Panel "Sapelet" Alder Select with Factory Finish (to be selected by Owner based on manufacturers full range).**

E. Exposed Cabinet End Finish: Hardwood Plywood with Hardwood Veneer. Stain and Finish to match cabinet doors and drawer fronts.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.

B. Install cabinets without distortion so doors and drawers fit openings and are aligned. Complete installation of hardware and accessories as indicated.

C. Install casework level and plumb to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m).

D. Fasten cabinets to adjacent units and to backing.

1. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches (600 mm) o.c. with No. 10 wafer-head screws sized for 1-inch (25-mm) penetration into wood framing, blocking, or hanging strips.
2. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches (600 mm) o.c., with toggle bolts through metal backing behind gypsum board.

E. Fasten plastic-laminate countertops by screwing through corner blocks of base units into underside of countertop. Form seams using splines to align adjacent surfaces, and secure with glue and concealed clamping devices designed for this purpose.

F. Fasten solid-surfacing-material countertops by screwing through corner blocks of base units into underside of countertop. Align adjacent surfaces, and form seams to comply with manufacturer's written instructions using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

G. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

END OF SECTION 123530

SECTION 129300 – LANDSCAPE FURNISHINGS AND POND EQUIPMENT

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. Black Steel 6’ garden benches. Provide (2) per Owners location selection along garden path.
   2. Drinking Fountain, provide one and install per Owners selected space within 25 ft of Building
   3. Bike Rack: Provide (1) per Owners location selection

1.3 QUALITY ASSURANCE

A. Mark locations of all site furnishings per Project Drawings. Call for inspection 48 hours in advance for approval by Project Landscape Architect.

B. Provide Submittals for each product.

C. Provide Color and Finish Samples.

D. Provide copies of product purchase records no later than 60 days from award of contract.

E. Keep all site furnishings under cover and dry. Protect from weather and vandalism.

PART 2 - PRODUCTS

2.1 Black Steel Garden Benches or approved equal shall be:

A. Global Industries 6’ Outdoor Bench with Back, Vertical Steel Slats
Model WB694854BKKD

2.2 Barrier Free Drinking Fountain or approved equal shall be:

A. Haws Model #3177
Concrete Pedestal Drinking Fountain with Exposed Aggregate Finish
www.hawsco.com

Part Number 011018

2.6 Wagner Collaborative Metal Works:

6”wide, three loop serpentine bike rack, model SR3G, Schedule 40, 2” nominal,Hot Dipped Galvanized w/ in-ground mounting system.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Mark locations in the field for all site furnishings and pool equipment for approval by Project Landscape Architect prior to installation.

B. Comply with manufacturer’s written installation instructions and Project Drawings and details. Complete field assembly of site furnishings and pond equipment where required.

C. Unless otherwise indicated, install site furnishing and pond equipment after landscaping and paving have been completed.

3.2 PROTECTION

A. Use all means necessary to protect materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.

END OF SECTION 129300

SECTION 321320 - CONCRETE PAVING

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 exterior cement concrete pavement for the following:
   1. Curbs and gutters.
   2. Walkways and ramps.
   3. Plazas and Patios.

1.3 SUBMITTALS

A. Design Mixtures: For each concrete pavement mixture.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.

PART 2 - PRODUCTS

2.1 BASE MATERIAL

A. Graded Aggregate for Base: Sound, crushed stone or gravel complying with ASTM D 448 for Size No. 8. Requirements in Division 31 Section "Grading" for base course.

2.2 STEEL REINFORCEMENT

A. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice."

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout the Project:

1. Portland Cement: ASTM C 150, Type I, gray. Supplement with the following:
2. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate, uniformly graded. Provide aggregates from a single source.
3. Water: ASTM C 94/C 94M.
4. Air-Entraining Admixture: ASTM C 260.
5. Chemical Admixtures: ASTM C 494/C 494M, of type suitable for application, certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

2.5 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.

2.6 MIXTURE FOR CONCRETE WALKS

A. Prepare design mixtures, proportioned according to ACI 301, with the following properties:

1. 4” thick section with #3 rebar at 24” o.c. each way.

2. Compressive Strength (28 Days): 2500 psi (31 MPa).

3. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.

4. Slump Limit: 4 Inches (100 mm), plus or minus 1 inch (25 mm).

5. Air Content: 6 percent plus or minus 1.5 percent.

2.7 CONCRETE MIXING

A. Ready-Mixed Colored Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Project Paving.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and for inspection and approval by the Project Landscape Architect.

B. Call for inspection 48 hours in advance by the Project Landscape Architect to inspect and approve all forms and expansion joint locations prior to concrete placement.

C. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.4 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

D. 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 to match jointing of existing adjacent concrete pavement.

E. Edging: Tool edges of pavement and joints in concrete after initial floating with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.5 CONCRETE PLACEMENT

A. Moisten subbase to provide a uniform dampened condition at time concrete is placed.

B. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

C. 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.

D. Screed pavement surfaces with a straightedge and strike off.

E. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface recycled glass.

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 bleed-water 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.

1. Heavy-to-Medium-Textured Broom Finish on driveways, Parking lots, Ramps and roadways unless noted otherwise on the Project Drawings : Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
2. Medium-to-Fine-Textured Broom Finish on curbs, gutters and walkways unless noted otherwise on the Project Drawings: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
3. Construct control and construction joints as indicated on the Project Drawings.
4. Apply score lines, ¼” (6mm) deep to surfaces as indicated on the Project Drawings.

3.7 CONCRETE PROTECTION AND CURING

C. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

D. Comply with ACI 306.1 for cold-weather protection.

E. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x 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.

F. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

G. Curing Methods: Cure concrete by a combination of moisture curing and moisture-retaining cover curing.

3.7 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch (6 mm).
2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/4 inch (6 mm).
4. Joint Spacing: 3 inches (75 mm).
5. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
6. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.8 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.

B. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement.

C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321320

SECTION 323119 - DECORATIVE METAL FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel rolling gates.
2. Gate operators, including controls.
3. Trash enclosure swing gates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For gates. Include plans, elevations, sections, details, and attachments to other work.

1. Include diagrams for power, signal, and control wiring.

C. Samples: For rolling gates and color specified.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For gate operators to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 DECORATIVE STEEL FENCES

A. Decorative Steel Fences: Fences made from steel tubing and shapes.

1. 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:

a. Ameristar Fence Products.
b. Ametco Manufacturing Corporation.
c. Metalco Fence & Railing Systems; Atlantis Products, Inc.

B. Rails:

1. Steel Tube Rails: Square steel tubing 2 by 2 inches (51 by 51 mm) with [1/8-inch (3.2-mm) wall thickness.

C. Pickets: 3/4-inch- (19-mm-) square galvanized steel bars terminated as indicated.

1. Picket Spacing: [6 inches (152.4 mm)] [4 inches (101.6 mm)] [1-3/4 inches (44 mm)] <Insert dimension> clear, maximum.

2.2 TRASH ENCLOSURE SWING GATES

A. Galvanized-Steel Frames and Bracing: Fabricate members from square tubes 2 by 2 inches (51 by 51 mm) formed from 0.108-inch (2.74-mm) nominal-thickness, metallic-coated steel sheet or formed from 0.105-inch (2.66-mm) nominal-thickness steel sheet and hot-dip galvanized after fabrication.

B. Hardware: Latches permitting operation from both sides of gate, hinges, and keepers for each gate leaf more than 5 feet (1.52 m) wide. Provide center gate stops and cane bolts for pairs of gates. Provide spring loaded wheels.

C. Galvanizing: For items other than hardware that are indicated to be galvanized, hot-dip galvanize to comply with ASTM A 123/A 123M. For hardware items, hot-dip galvanize to comply with ASTM A 153/A 153M.

D. Steel Finish: see exterior painting specification for galvanized steel.

2.3 GATE OPERATORS

A. Gate Operators:

1. 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:

a. Chamberlain Group, Inc. (The).
b. DoorKing, Inc.
c. FAAC USA.
d. HySecurity.

B. Provide factory-assembled automatic operating system designed for gate size, type, weight, and operation frequency. Provide operation control system with characteristics suitable for Project conditions, with remote-control stations, safety devices, and weatherproof enclosures; coordinate electrical requirements with building electrical system.

1. Provide operator with UL approval and approved components.

C. Comply with NFPA 70.

D. UL Standard: Manufacturer and label gate operators to comply with UL 325.

E. Motor Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, within installed environment, with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1 and the following:

1. Voltage: 120 V.
2. Duty: Continuous duty at ambient temperature of 105 deg F (40 deg C) and at altitude of 3300 feet (1005 m) above sea level.
3. Service Factor: 1.15 for open dripproof motors; 1.0 for totally enclosed motors.
4. Phase: One.

F. Gate Operators: Concrete base mounted and as follows:

1. Mechanical Gate Operators:

a. Duty: Medium duty, commercial/industrial.
b. Maximum Gate Weight: 1500 lb.
c. Frequency of Use: 25 cycles per hour.

G. Remote Controls: Electric controls separated from gate and motor and drive mechanism, with NEMA ICS 6, Type 1 pedestal mounting, and with space for additional optional equipment. Provide the following remote-control device(s):
1. Digital Keypad Entry and Exit units(2): multiple-code capability.
2. Radio Control: Digital system consisting of code-compatible universal receiver for each gate. Provide four programmable transmitter(s).

H. Vehicle Loop Detector: System includes automatic closing timer with adjustable time delay and loop detector designed to hold gate open until traffic clears.

I. Obstruction Detection Devices: Provide each motorized gate with automatic safety sensor(s). Activation of sensor(s) causes operator to immediately stop gate in opening cycle and reverse gate in closing cycle, and hold until clear of obstruction.

J. Accessories:

1. Warning Module: Audio alarm sounding three to five seconds in advance of gate operation and continuing until gate stops moving; compliant with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.
2. Battery Backup System: Battery-powered drive and access-control system, independent of primary drive system:
3. Instructional, Safety, and Warning Labels and Signs: According to UL 325.

2.4 MISCELLANEOUS MATERIALS

A. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Section 033000 "Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi (20 MPa), 3-inch (75-mm) slump, and 1-inch (25-mm) maximum aggregate size.

2.5 GROUNDING MATERIALS

A. Grounding Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.

1. Material above Finished Grade: Copper.
2. Material on or below Finished Grade: Copper.

B. Grounding Connectors and Grounding Rods: Comply with UL 467.

PART 3 - EXECUTION

3.1 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.2 GATE OPERATOR INSTALLATION

A. General: Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.

B. Excavation for Support Posts,Pedestals and Concrete Bases: Hand-excavate holes for bases in firm, undisturbed soil to dimensions and depths and at locations as required by gate operator component manufacturer's written instructions and as indicated.

C. Concrete Bases: Cast-in-place or precast concrete, depth not less than 12 inches (300 mm), dimensioned and reinforced according to gate operator component manufacturer's written instructions and as indicated on Drawings.

D. Vehicle Loop Detector System: Cut grooves in pavement and bury and seal wire loop according to manufacturer's written instructions. Connect to equipment operated by detector.

E. Comply with NFPA 70 and manufacturer's written instructions for grounding of electric-powered motors, controls, and other devices.

END OF SECTION 323119

SECTION 328400 - PLANTING IRRIGATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1. Section Includes:

    1. Piping.
    2. Encasement for piping.
    3. Manual valves.
    4. Pressure-reducing valves.
    5. Automatic control valves.
    6. Automatic drain valves.
    7. Transition fittings.
    8. Miscellaneous piping specialties.
    9. Quick couplers.
    10. Drip irrigation specialties.
    11. Controllers.
    12. Boxes for automatic control valves.

1.3 DEFINITIONS

1. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

2. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

3. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

4. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.4 PERFORMANCE REQUIREMENTS

1. Irrigation zone control shall be automatic operation with controller and automatic control valves.

2. Location of Sprinklers and Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards. Maintain 100 percent irrigation coverage of areas indicated.

3. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:

    1. Irrigation Main Piping: 50 psig (1380 kPa).
    2. Circuit Piping: 50 psig (1035 kPa).

1.5 SUBMITTALS

1. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

    1. Before any work is begun, a materials list shall be submitted. For any items that are not specified, present catalog data and full descriptive literature to landscape architect for approval. Certification for pipe or fittings that are other that specified must provided by notarized statement by authorized personnel from the manufacturer that they meet specifications.

    2. Material or equipment furnished or installed without prior approval from the landscape architect may be rejected and such material shall be removed from the project at no expense to the owner.

2. Wiring Diagrams: For power, signal, and control wiring.

3. Coordination Drawings: Irrigation systems, drawn to scale, on which components are shown and coordinated with each other, using input from Installers of the items involved. Also include adjustments necessary to avoid plantings and obstructions such as signs and light standards.

4. Qualification Data: For qualified Installer.

5. Zoning Chart: Show each irrigation zone and its control valve.

6. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.

7. Field quality-control reports.

8. Operation and Maintenance Data: For sprinklers controllers and automatic control valves to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.7 DELIVERY, STORAGE, AND HANDLING

1. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

2. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

1. PVC Pipe, Pressure Rated: ASTM D 2241, PVC 1120 compound, SDR 21 and SDR 26.

    1. PVC Socket Fittings: ASTM D 2467, Schedule 80.
    2. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.
    3. Pipe Dating: Pipe manufactured before more then two years before installation is not permitted. All pipes shall have been protected from sun exposure during storage and installation.
    4. Thrust Blocks: All 3” and larger mainline pipes shall have thrust blocks. All ends, corners, etc. on mainline which are smaller then 3” which would receive thrusts from the gasketed mainline shall have a thrust block.
    5. All mainline and lateral line pipe shall be sch. 40

2.2 PIPING JOINING MATERIALS

1. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.3 ENCASEMENT FOR PIPING

1. Sleeve Materials: PVC Schedule 40.

2.4 MANUAL VALVES

1. Brass Ball Valves:

    1. 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:

        a. Crane Co.; Crane Valve Group; Crane Valves.
        b. Crane Co.; Crane Valve Group; Jenkins Valves.
        c. DynaQuip Controls.
        d. Hammond Valve.
        e. Jamesbury; a subsidiary of Metso Automation.

f. KITZ Corporation.
g. Legend Valve.
h. Marwin Valve; a division of Richards Industries.
i. Milwaukee Valve Company.
j. NIBCO INC.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig (1035 kPa).
c. CWP Rating: 600 psig (4140 kPa).
d. Body Design: Two piece.
e. Body Material: Forged brass.
f. Ends: Threaded or solder joint if indicated.
g. Seats: PTFE or TFE.
h. Stem: Brass.
i. Ball: Chrome-plated brass.
j. Port: Full.

2.5 AUTOMATIC DRAIN VALVES

1. Description: Spring-loaded-ball type of corrosion-resistant construction and designed to open for drainage if line pressure drops below 2-1/2 to 3 psig (17 to 20 kPa).

2.6 TRANSITION FITTINGS

1. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

2. Transition Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Cascade Waterworks Manufacturing.
b. Dresser, Inc.; DMD Division.
c. Ford Meter Box Company, Inc. (The).
d. JCM Industries.
e. Smith-Blair, Inc; a Sensus company.
f. Viking Johnson.

2. Description: AWWA C219, metal sleeve-type coupling for underground pressure piping.

3. Plastic-to-Metal Transition Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Harvel Plastics, Inc.

b. Spears Manufacturing Company.

2. Description: PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-socket or threaded end.

4. Plastic-to-Metal Transition Unions:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Colonial Engineering, Inc.
b. NIBCO INC.
c. Spears Manufacturing Company.

2. Description: MSS SP-107, PVC four-part union. Include one brass threaded end, one solvent-cement-joint or threaded plastic end, rubber O-ring, and union nut.

5. Plastic, Tree Well with Bubbler:

1. Manufacturers: Rain Bird RWS-BG: RWS with 1401 bubbler, locking grate and swing assembly.

2. Description:

a. Body Material: ABS.
b. Nozzle: ABS.
c. Internal Parts: Corrosion resistant.
d. Pattern: Fixed, with flow adjustment.

2.7 QUICK COUPLERS

1. Manufacturers: Subject to compliance with requirements, Rain Bird 33DRC Quick-Coupling Valve.

2. Basis-of-Design Product: Subject to compliance with requirements, provide three quick couplers:

i. one in the front of the building on Juniper Ridge.

ii. One along Sierra Madre

iii. One in the maneuvering area behind the station.

Meet with Architect to select exact locations.

3. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.

1. Locking-Top Option: Vandal-resistant locking feature. Include two matching key(s).

2.8 DRIP IRRIGATION SPECIALTIES

1. Manufacturers: Products specified on plan.
   1. Netafim USA. Techline CV

2. Freestanding Emitters: Device to deliver water at approximately 20 psig (138 kPa).

   1. Body Material: PE or vinyl, with flow control.
   2. Riser to Emitter: PE or PVC flexible tubing.
   3. Capacities and Characteristics:

      a. Flow: 0.4 gph at approximately 20 psig (138 kPa).

3. Manifold Emitter Systems: Manifold with tubing and emitters.

   1. Manifold: With multiple outlets to deliver water to emitters.

      a. Body Material: Plastic.
      b. Outlet Caps: Plastic, for outlets without installed tubing.
      c. Operation: Automatic pressure compensating.

   2. Emitter: Device to deliver water at approximately 20 psig (138 kPa).

      a. Body Material: PE or vinyl, with flow control.

   3. Capacities and Characteristics:

   4. Capacities and Characteristics:

      a. Tubing Size: NPS 1/2 (DN 15) .
      b. Emitter Spacing: 18 inches
      c. Emitter Flow: 0.4 gph
      d. Tubing Spacing: 24” o.c. typ.

2.9 CONTROLLERS

1. See Irrigation Plan

2.10 BOXES FOR AUTOMATIC CONTROL VALVES

1. Plastic Boxes:

   1. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.

      a. Size: As required for valves and service.

b. Shape: Rectangular.
c. Sidewall Material: PE .
d. Cover Material: PE .

2. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4 inch (19 mm) minimum to 3 inches (75 mm) maximum.

PART 3 - EXECUTION

3.1 EARTHWORK

1. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

2. Install warning tape directly above pressure piping, 12 inches (300 mm) below finished grades, except 6 inches (150 mm) below subgrade under pavement and slabs.

3. Drain Pockets: Excavate to sizes indicated. Backfill with cleaned gravel or crushed stone, graded from 3/4 to 3 inches (19 to 75 mm), to 12 inches (300 mm) below grade. Cover gravel or crushed stone with sheet of asphalt-saturated felt and backfill remainder with excavated material.

4. Provide minimum cover over top of underground piping according to the following:

    1. Irrigation Main Piping: Minimum depth of 18 inches.
    2. Circuit Piping: 12 inches (300 mm).
    3. Drain Piping: 12 inches (300 mm).
    4. Sleeves: 24 inches (600 mm).

3.2 PREPARATION

1. Set stakes to identify locations of proposed irrigation system. Obtain Architect's approval before excavation.

3.3 PIPING INSTALLATION

1. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.

2. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

3. Install piping free of sags and bends.

4. Install groups of pipes parallel to each other, spaced to permit valve servicing.

5. Install fittings for changes in direction and branch connections.

6. Install unions adjacent to valves and to final connections to other components with NPS 2 (DN 50) or smaller pipe connection.

7. Install flanges adjacent to valves and to final connections to other components with NPS 2 (DN 65) or larger pipe connection.

8. Install underground thermoplastic piping according to ASTM D 2774.

9. Install expansion loops in control-valve boxes for plastic piping.

10. Lay piping on solid subbase, uniformly sloped without humps or depressions.

11. Install ductile-iron piping according to AWWA C600.

12. Install PVC piping in dry weather when temperature is above 40 deg F (5 deg C). Allow joints to cure at least 24 hours at temperatures above 40 deg F (5 deg C) before testing.

13. Install water regulators with shutoff valve and strainer on inlet and pressure gage on outlet. Install shutoff valve on outlet. Install aboveground or in control-valve boxes.

14. Water Hammer Arresters: Install between connection to building main and circuit valves aboveground or in control-valve boxes.

15. Install piping in sleeves under parking lots, roadways, and sidewalks.

16. Install sleeves made of Class 200 PVC pipe and socket fittings, and solvent-cemented joints.

17. Install transition fittings for plastic-to-metal pipe connections according to the following:

    1. Underground Piping:

        a. NPS 1-1/2 (DN 40) and Smaller: Plastic-to-metal transition fittings.
        b. NPS 2 (DN 50) and Larger: AWWA transition couplings.

    2. Aboveground Piping:

        a. NPS 2 (DN 50) and Smaller: Plastic-to-metal transition fittings.
        b. NPS 2 (DN 50) and Larger: Use dielectric flange kits with one plastic flange.

3.4 JOINT CONSTRUCTION

1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

3. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

    1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.

2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

4. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

    1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
    2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
    3. PVC Nonpressure Piping: Join according to ASTM D 2855.

3.5 VALVE INSTALLATION

1. Underground Iron Gate Valves, Resilient Seat: Comply with AWWA C600 and AWWA M44. Install in valve casing with top flush with grade.

    1. Install valves and PVC pipe with restrained, gasketed joints.

2. Aboveground Valves: Install as components of connected piping system.

3. Pressure-Reducing Valves: Install in boxes for automatic control valves or aboveground between shutoff valves. Install full-size valved bypass.

4. Throttling Valves: Install in underground piping in boxes for automatic control valves.

5. Drain Valves: Install in underground piping in boxes for automatic control valves.

3.6 DRIP IRRIGATION SPECIALTY INSTALLATION

1. Install system per manufacturer’s instructions for on surface system. Once system has been installed and tested, place a minimum 4” mulch cover over entire area served by Techline CV.

3.7 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

1. Equipment Mounting: Install interior controllers on wall.

    1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
    2. Install anchor bolts to elevations required for proper attachment to supported equipment.

2. Install control cable in same trench as irrigation piping and at least 2 inches (51 mm) below or beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

3.8 CONNECTIONS

1. Comply with requirements for piping specified in Division 22 Section "Facility Water Distribution Piping" for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.

2. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

3. Connect wiring between controllers and automatic control valves.

3.9 IDENTIFICATION

1. Identify system components. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

2. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.

    1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

3. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Division 31 Section "Earth Moving" for warning tapes.

3.10 FIELD QUALITY CONTROL

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

2. Perform tests and inspections.

    1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

3. Tests and Inspections:

    1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
    2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
    3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

4. Any irrigation product will be considered defective if it does not pass tests and inspections.

5. Prepare test and inspection reports.

3.11 STARTUP SERVICE

1. Perform startup service.

    1. Complete installation and startup checks according to manufacturer's written instructions.
    2. Verify that controllers are installed and connected according to the Contract Documents.
    3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.12 ADJUSTING

1. Adjust settings of controllers.

2. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.

3.13 CLEANING

1. Flush dirt and debris from piping before installing sprinklers and other devices.

3.14 PIPING SCHEDULE

1. Install components having pressure rating equal to or greater than system operating pressure.

2. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.

3. Circuit piping, NPS 2 (DN 50) and smaller, shall be one of the following:
    1. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.

4. Drain piping shall be the following:
    1. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.

3.16 MAINTENANCE

1. After the system has been completed, the contractor shall instruct the Owner’s authorized representatives in the operation and maintenance of the system and shall furnish three complete sets of operating and maintenance instructions.

2. The three sets of operating and maintenance instructions will be in a three ring binder and will contain complete parts list of materials and equipment installed in the landscape irrigation system.

3. The contractor is responsible for his installation for a period of one year. The contractor will bring back to proper grade any settlement that occurs, including replacement of sod or paving which has been damaged due to improper compaction, and will adjust all pipes,

sprinkler heads and valves. Contractor shall make adjustments and corrections without extra cost to owner.

END OF SECTION 328400

SECTION 329300 - PLANTS

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. Plants.
2. Planting soils.
3. Tree stabilization.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

C. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

D. Finish Grade: Elevation of finished surface of planting soil.

E. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

F. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

G. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

H. Planting Area: Areas to be planted.

I. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

J. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

K. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

L. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

M. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

N. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

O. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated, including soils.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to the Project.
3.

B. Samples for Verification: For each of the following:

1. Trees and Shrubs: Three samples of each variety and size delivered to the site for review. Maintain approved samples on-site as a standard for comparison.
2. Organic Mulch: 1-quart (1-liter) Insert quantity volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
3. Mineral Mulch: 2 lb (1.0 kg) of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on the site; provide an accurate indication of color, texture, and makeup of the material.
4. Weed Control Barrier: 12 by 12 inches (300 by 300 mm).
5. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.
6. Root Barrier: Width of panel by 12 inches (300 mm).

C. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

D. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

E. Material Test Reports: For standardized ASTM D 5268 topsoil and imported or manufactured topsoil.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.

G. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
1. Installer's Field Supervision: Require Installer to maintain at least one person who shall be present at all times during execution of this portion of the work, who shall be thoroughly familiar with the type of materials being installed and the proper materials and methods for their installation, and who shall direct all work performed under this section

B. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; [sodium absorption ratio;]deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. The soil-testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Architect. A minimum of [three] <Insert number> representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for plant growth.

    a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. (92.9 sq. m) or volume per cu. yd. (0.76 cu. m) for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such

problem materials are present, provide additional recommendations for corrective action.

C. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Selection of plants purchased under allowances will be made by Architect, who will tag plants at their place of growth before they are prepared for transplanting.

D. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches (150 mm) above the root flare for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

E. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Architect of sources of planting materials seven days in advance of delivery to site.

F. Pre-installation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

C. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F (16 to 18 deg C) until planting.

G. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:

1. Notify Construction Manager no fewer than two days in advance of proposed interruption of each service or utility.
2. Do not proceed with interruption of services or utilities without Architect's Construction Manager's written permission.

C. Planting Restrictions: Perform actual planting during periods when weather and soil conditions are sutible and in accordance with locally accepted practice, as approved by architect. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
   b. Structural failures including plantings falling or blowing over.
   c. Faulty performance of tree stabilization edgings .
   d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods from Date of Planting Completion :

   a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
   b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.

3. Include the following remedial actions as a minimum:

   a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
   b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
   c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
   d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.9 MAINTENANCE SERVICE

A. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period: Six months from date of planting completion .

B. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period: Six months from date of planting completion .

C. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is

concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots will be rejected.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.

E. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.2 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch (19-mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.3 FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.

B. Revise to suit Project. If

2.4 PLANTING SOILS

A. Planting Soil area one: ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth. Mix ASTM D 5268 topsoil with the following soil amendments in the following quantities to produce planting soil:

1. Ratio of Loose Compost to Topsoil by Volume: 1:4 .
2.
3. Volume of Sand Plus 10 Percent per 1000 Sq. Ft. (92.9 Sq. m): .

B. Planting Soil area two: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

1. .
2. Mix existing, native surface topsoil with the following soil amendments in the following quantities to produce planting soil:

    a. Ratio of Loose Compost to Topsoil by Volume: 1:4 .
    b. Volume of Sand Plus 10 Percent per 1000 Sq. Ft. (92.9 Sq. m): .

2.5 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Wood and bark chips .
2. Size Range: 3 inches (76 mm) maximum, 1/2 inch (13 mm) minimum.
3. Color: Natural.

B. Mineral Mulch: Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of following type, size range, and color:

1. Type: Granite chips.
2. Size Range: 3/4 inch (19 mm) maximum, 1/4 inch (6.4 mm) minimum.
3. Color: Uniform tan-beige color range acceptable to Architect .

2.6 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. (101g/sq. m) minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally-encountered chemicals, alkalis, and acids.

2.7 TREE STABILIZATION MATERIALS

A. Stakes and Guys:

1. Upright and Guy Stakes: Rough-sawn, sound, new lodge pine, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated, pointed at one end.
2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes
    1) Retain paragraph below for palm trees; revise to suit Project.

2.8 MISCELLANEOUS PRODUCTS

A. Root Barrier: Black, molded, modular panels manufactured with 50 percent recycled polyethylene plastic with ultraviolet inhibitors, 85 mils (2.2 mm) thick, with vertical root deflecting ribs protruding 3/4 inch (19 mm) out from panel, and each panel 24 inches (610 mm) wide.

B. Burlap: Non-synthetic, biodegradable.

C. Planter Drainage Gravel: Washed, sound crushed stone or gravel complying with ASTM D 448 for Size No. 8.

D. Planter Filter Fabric: Nonwoven geotextile manufactured for separation applications and made of polypropylene, polyolefin, or polyester fibers or combination of them.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.

2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3 PLANTING AREA ESTABLISHMENT

A. Loosen subgrade of planting areas to a minimum depth of 12 inches (300 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

Retain first subparagraph below if required. Coordinate with "Planting Soils" Article.

1. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
    a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    b. Mix lime with dry soil before mixing fertilizer.

B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.

1. Excavate approximately two times as wide as ball diameter for balled and potted stock.
2. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
3. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
4. Maintain supervision of excavations during working hours.
5. Keep excavations covered or otherwise protected overnight .
6. If drain tile is shown on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes, 24 inches (600 mm) apart, into free-draining strata or to a depth of 10 feet (3 m), whichever is less, and backfill with free-draining material.

C. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

D. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 2 inches (50 mm) above adjacent finish grades.

1. Use planting soil for backfill.
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.

3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 TREE, SHRUB, AND VINE PRUNING

A. Limit pruning to the minimum necessary to remove injured twigs and branches, and to compensate for loss of roots during transplanting, but never to exceed one third of the branching structure.

B. Paint cuts over three quarters of an inch in diameter with an approved tree wound paint.

3.7 TREE STABILIZATION

A. Install trunk stabilization as follows unless otherwise indicated:

1. Upright Staking and Tying: Stake trees of 2- through 5-inch (50- through 125-mm) caliper. Stake trees of less than 2-inch (50-mm) caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches (450 mm) below bottom of backfilled excavation and to extend to the dimension shown on Drawings above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
2. Use two stakes for trees up to 12 feet (3.6 m) high and 2-1/2 inches (63 mm) or less in caliper; three stakes for trees less than 14 feet (4.2 m) high and up to 4 inches (100 mm) in caliper. Space stakes equally around trees.
3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

4. Retain one of first two

B. Root-Ball Stabilization: Install at- or below-grade stabilization system to secure each new planting by the root ball unless otherwise indicated.

3.8 ROOT-BARRIER INSTALLATION

A. Install root barrier where trees are planted within 60 inches (1500 mm) of paving or other hardscape elements, such as walls, curbs, and walkways unless otherwise shown on Drawings.

B. Align root barrier vertically and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.

C. Install root barrier continuously for a distance of 60 inches (1500 mm) in each direction from the tree trunk, for a total distance of 10 feet (3 m) per tree. If trees are spaced closer, use a single continuous piece of root barrier.

1. Position top of root barrier per manufacturer's recommendations.
2. Overlap root barrier a minimum of 12 inches (300 mm) at joints.
3. Do not distort or bend root barrier during construction activities.
4. Do not install root barrier surrounding the root ball of tree.

3.9 PLANTING IN PLANTERS

A. Place a layer of drainage gravel at least 4 inches (100 mm) thick in bottom of planter. Cover bottom with filter fabric and wrap filter fabric 4 inches (100 mm) up on all sides. Duct tape along the entire top edge of the filter fabric, to secure the filter fabric against the sides during the soil-filling process.

3.10 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.11 PLANTING AREA MULCHING

A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 12 inches (300mm) and secure seams with galvanized pins.

B. Mulch backfilled surfaces of planting areas and other areas indicated.
1. Organic Mulch in Planting Areas: Apply 4 inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within [3 inches (75 mm)] [6 inches (150 mm)] <Insert distance> of trunks or stems.

2. Mineral Mulch in Planting Areas: Apply [2-inch (50-mm)] [3-inch (75-mm)] <Insert dimension> average thickness of mineral mulch [extending 12 inches (300 mm) beyond edge of individual planting pit or trench] [and] [over whole surface of planting area], and finish level with adjacent finish grades. Do not place mulch within 3 inches (75 mm) of trunks or stems.

3.12 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.13 CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

C. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.14 DISPOSAL

A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 329300