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PROJECT MANUAL

for

NEW VILLAGE ARTS THEATRE

2787 State Street
Carlsbad Village, CA 92008



February 11, 2022
(UPDATED 3-11-22)

Prepared by



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SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. The work of this Contract comprises remodel of the Village Arts Theatre in Carlsbad Village, California.
- B. Perform work in accordance with the codes, ordinances, and amendments in effect in the location of the Project.

1.02 CONTRACTS

- A. Perform the work per the Agreement to be executed between the Owner and Contractor.

1.03 WORK SEQUENCE

- A. Perform the work in a single phase.

1.04 ACCESS TO SITE

- A. Notify the City and County agencies, as applicable, a minimum of 48-hours in advance of performing work which necessitates closing or interfering with traffic on public thoroughfares. Obtain written permission prior to effecting such closures and interruptions.

1.05 CONTRACTOR USE OF PREMISES

- A. During the construction period, the Contractor shall have use of the existing building for construction operations, including use of the site. The Contractor's use of the premises is limited by Owner's right to perform construction operations with its own forces or to employ separate contractors on portions of the Project.

1.06 ADJACENT SITE CONDITION SURVEY

- A. Prior to commencement of work, jointly survey the site, paving, plant life, and other items with the Owner, noting and recording existing damage such as cracks, sags, unhealthy plant life, and other damage.
- B. This record shall serve as a basis for determination of subsequent damage to these items due to settlement, movement, or Contractor's operations.
- C. Existing damage observed shall be marked and the official record of existing damage shall be signed by the parties making the survey.
- D. Cracks, sags, and damage to the site, paving, plant life, and other items not noted in the original survey but subsequently observed shall be reported immediately to the Architect.

1.07 PROTECTION OF EXISTING UTILITIES

- A. The Drawings may not show all existing above and below grade drainage lines; storm drains; sewers; water, gas, and electrical lines; and other existing utilities in the work area.

- B. Locate these existing installations before proceeding with excavation or other operations which may cause damage, maintain them in service where appropriate, and repair damage caused by the performance of the work, at no increase in the Contract Sum.
- C. Additional compensation or extension of time due to below grade structures not shown or brought to the Contractor's attention, including reasonable action taken to protect, relocate, and repair damage to same, shall be determined as specified in the General Conditions.

1.08 USE AND OCCUPANCY OF WORK PRIOR TO ACCEPTANCE BY OWNER

- A. The Owner may use and occupy the building before formal acceptance under the following conditions:
 - 1. A Certificate of Substantial Completion shall be prepared and executed as provided in the General Conditions. The Certificate of Substantial Completion shall be accompanied by a written endorsement of the Contractor's insurance carrier and surety permitting occupancy by the Owner during the remaining period of the work.
 - 2. Occupancy by the Owner shall not be construed as being an acceptance of that part of the work occupied.
 - 3. The Contractor will not be held responsible for damage to the occupied part of the work resulting from the Owner's occupancy.
 - 4. Occupancy by the Owner shall not be deemed to constitute a waiver of existing claims the Owner or Contractor may have against each other.
 - 5. If required by the Owner for areas it has occupied, the Contractor shall make available, on a 24 hour-a-day, 7 day-a-week basis, utility services, heating, and cooling which are in condition to be put in operation when such use and occupancy is taken. Responsibility for the operation and maintenance shall remain with the Contractor until the building is complete and the areas occupied, at which time operation and maintenance shall be assumed by the Owner if Contract requirements for such equipment have been met.
 - 6. Make an itemized list of each piece of equipment operated during occupancy, with the date operation commences; submit to the Architect, who will transmit it to the Owner. This list shall be the basis for the commencement of guarantee/warranty periods on the equipment operated during the Owner's occupancy.
 - 7. The Owner will pay for utility costs associated with occupancy during construction.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Furnish and install products specified, under options and conditions for substitutions stated in this Section.
 - 1. Use Substitution Request Form attached at the end of this Section.
- B. Related Sections:
 - 1. Common product requirements are specified in Section 01 61 00.

1.02 SUBSTITUTIONS

- A. Catalog numbers and specific brands or trade names are used in conjunction with material and equipment required by the Specifications to establish the standard of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be accepted subject to the following provisions:
 - 1. Substitutions shall be accepted in writing by the Architect.
 - 2. The determination of the Architect shall be final.
 - 3. Failure of Contractor to submit proposed substitutions for approval in the manner described above and within the time prescribed shall be sufficient cause for disapproval by the Architect of any substitutions otherwise proposed.
 - 4. The Architect will accept, in writing, proposed substitutions that are in Architect's opinion equal in quality, utility, and appearance to the material or equipment specified.
 - 5. Acceptance shall not relieve Contractor from complying with the requirements of the Drawings and Specifications.
 - 6. Contractor shall be responsible for costs of any changes resulting from Contractor's proposed substitution which affect other parts of the work or the work of Separate Contractors, including the cost of the Architect's additional services, testing, permits thereby made necessary.
- B. Requests for substitutions will only be considered if the Contractor submits the following:
 - 1. PDF copy of completed Submittal Form attached at the end of this Section.
 - 2. Complete technical data including drawings, performance specifications, samples, and test reports of the article proposed for substitution; and any additional information required by the Architect.

3. Complete breakdown of costs, including savings generated by the proposed substitution. For guaranteed maximum price Contracts, include the amount, if any, to be deducted from the Contract Sum if the proposed substitution is accepted.
 4. Statement by the Contractor that the proposed substitution is in full compliance with the requirements of the Contract Documents and Applicable Code Requirements.
 5. List of other trades, if any, which may be affected by the substitution.
 6. If the proposed substitution requires that portions of the Project be redesigned or construction be removed to accommodate the substituted item, submit design and engineering calculations prepared by a properly licensed design professional. The Contractor shall bear all costs resulting from the substitution.
- C. Submit separate request form for each substitution. Support each request with:
1. Complete data substantiating compliance of proposed substitution with requirements stated in Contract Documents.
 - a. Product identification including manufacturer's name and address.
 - b. Manufacturer's literature including products description, reference standards and performance and test data.
 - c. Samples, as applicable.
 - d. Name and address of similar projects on which product has been used, and date of each installation.
 2. Itemized comparison of the proposed substitution with specified product. List significant variations.
 3. Data relating to changes in construction schedule.
 4. Any effect of substitution on separate contracts.
 5. List of changes required on other work or products.
 6. Accurate cost data comparing proposed substitution with specified product.
 7. Designation of availability of maintenance services, sources of replacement materials.
- D. Substitutions will not be considered for acceptance when:
1. They are indicated or implied on shop drawings or product data submittals without a formal request from Contractor.
 2. They are requested directly by a subcontractor or supplier.
 3. Acceptance will require substantial revision of Contract Documents.

4. Insufficient information is submitted.

E. Substitutions shall be considered as a Change Order and be approved by the Architect prior to fabrication or installation.

1.03 CONTRACTOR'S REPRESENTATION

A. In making a formal request for substitution, Contractor represents that they:

1. Have investigated proposed product and has determined that it is equal to or superior to that specified.
2. Will provide same warranties for substitution as for product specified.
3. Will coordinate installation of accepted substitution into the work and will make such changes as may be required for the work to be complete in all respects.
4. Waives claims for additional costs caused by substitution which may subsequently become apparent.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION



SUBSTITUTION REQUEST (After the Bidding Phase)

Project: _____ Substitution Request Number: For the Architect to fill in.

From: _____
To: _____ Date: _____

A/E Project Number: _____
Re: _____ Contract For: _____

Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____
Manufacturer: _____ Address: _____ Phone: _____
Trade Name: _____ Model No.: _____
Installer: _____ Address: _____ Phone: _____

History: ☐ New product ☐ 2-5 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

☐ Point-by-point comparative data attached – REQUIRED BY A/E.

Reason for not providing specified item: _____

Similar Installation:

Project: _____ Architect: _____
Address: _____ Owner: _____
_____ Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

Savings to Owner for accepting substitution: _____ (\$ _____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

SUBSTITUTION REQUEST (Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

Attachments: _____

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- ☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: _____

Date: _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐ _____

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections:
 - 1. Requests for Interpretation (RFI) are specified in Section 01 26 15.

1.02 CHANGE ORDER PROPOSAL REQUESTS

- A. Owner- or Architect-Initiated Proposal Requests: Proposed changes in the work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
 - 1. Proposal requests issued by the Architect are for information only. Do not consider them an instruction either to stop work in progress, or to execute the proposed change.
 - 2. Unless otherwise indicated in the proposal request, within 20-days of receipt of the proposal request, submit to the Architect for review an estimate of cost necessary to execute the proposed change.
 - a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include a statement indicating the effect the proposed change in the work will have on the Contract Time.
- B. Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change.
 - 1. Include a statement outlining the 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 Contract Time.
 - 2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Comply with requirements in Section 01 25 00 if the proposed change in the work requires the substitution of one product or system for a product or system specified.
 5. Proposal Request Form: Use AIA Document G709 for Change Order Proposal Requests or a form acceptable to the Owner and Architect.
- C. Supplemental Instructions from the Architect (ASI): Use AIA Form G710 or a form furnished by the Owner's Representative.

1.03 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714 instructing the Contractor to proceed with a change in the work, for subsequent inclusion in a Change Order.
1. The Construction Change Directive will contain a complete description of the change in the work and designate the method to be followed to determine change in the Contract Sum or Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
- C. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.04 CHANGE ORDER PROCEDURES

- A. Upon approval of a Change Order Proposal Request, the Contractor shall issue a Change Order for signatures of the Owner or Owner's Representative, Architect, and Contractor on AIA Form G701.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 26 15

REQUESTS FOR INTERPRETATION (RFI)

PART 1 – GENERAL

1.01 GENERAL

- A. This Section contains the procedures to be followed by the Contractor upon discovery of any apparent conflicts, omissions, or errors in the Contract Documents or upon having any question concerning interpretation.

1.02 DEFINITIONS

- A. Requests for Interpretation: A request from the Contractor seeking an interpretation or a clarification of some requirement of the Contract Documents. The Contractor shall clearly set forth the issue requiring clarification or interpretation and why a response is needed. Responses from the Architect will not change any requirements of the Contract Documents.
- B. Drawing/Plan Clarification: An answer from the Architect in response to an inquiry from the Contractor, intended to make some requirement(s) of the Drawings understood. Drawing/plan clarifications may be sketches, drawings, or in narrative form and will not change any requirements of the Drawings.
- C. Non-Conformance Notice: A notice issued by the Architect documenting that the work or some portion thereof has not been performed in accordance with the requirements of the Contract Documents. Payment will not be made on any portion of the work for which a Non-Conformance Notice has been issued and the work not corrected to the Satisfaction of the Architect. Upon receipt of a Non-Conformance Notice, the Contractor shall provide a written response within 5 working days after receipt, noting why they believe the work was performed in accordance with the Contract Documents or what corrective action they intend to take to correct the non-conforming work. Written responses from the Contractor are not considered to be RFI's.
- D. Project Communications: Routine written communications between the Architect and Contractor shall be in writing, field memo, or e-mail. Such communications shall not be identified as RFI's.

1.03 PROCEDURES

- A. Notification by Contractor:
 - 1. Submit requests for clarification of additional information in PDF format to the Architect using the Request for Interpretation (RFI) Form attached at the end of this Section or other form approved by the Architect.
 - 2. Number RFIs sequentially. Follow RFI number with sequential alphabetical suffix as necessary for each resubmission. For example, the first RFI would be "1"; the second RFI would be "2." The first resubmittal of RFI "2" would be "2a", etc.
 - 3. Limit each RFI to one subject.

4. Submit an RFI if one of the following conditions occurs:
 - a. The Contractor discovers an unforeseen condition or circumstance that is not described in the Contract Documents.
 - b. The Contractor discovers an apparent conflict or discrepancy between portions of the Contract Documents that appears to be inconsistent or cannot be reasonably inferred from the intent of the Contract Documents.
 - c. The Contractor discovers what appears to be an omission from the Contract Documents that cannot be reasonably inferred from the intent of the Contract Documents.
5. RFIs will not be recognized or accepted if, in the opinion of Architect, one of the following conditions exists:
 - a. The Contractor submits the RFI as a request for substitution.
 - b. The Contractor submits the RFI as a submittal.
 - c. The Contractor submits the RFI under pretense of a Contract Documents discrepancy or omission without thorough review of the Contract Documents.
 - d. The Contractor submits the RFI in a manner that suggests that specific portions of the Contract Documents are assumed to be excluded or by taking an isolated portion of the Contract Documents in part rather than whole.
 - e. The Contractor submits an RFI in an untimely manner without proper coordination and scheduling of Work of related trades.
6. Ask for any clarification or request for interpretation immediately upon discovery. Submit RFIs in a reasonable time frame so as not to affect the Contract Schedule while allowing the full response time specified below.

1.04 RESPONSE TIME

- A. The Architect, whose decision will be final and conclusive, will resolve such questions and issue instructions to the Contractor within a reasonable time frame. In most cases, RFIs will receive a response within 10 working days. In some cases, this time may need to be lengthened for complex issues, or shortened for emergency situations, as mutually agreed in writing.
- B. Should the Contractor proceed with the work affected before receipt of a response from the Architect, within the response time specified above, any portion of the work that is not done in accordance with the Architect's interpretations, clarifications, instructions, or decisions is subject to removal or replacement and the Contractor shall be responsible for all resultant losses.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

New Village Arts Theatre
Carlsbad Village, CA

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Not used.

END OF SECTION

REQUEST FOR INTERPRETATION

Project: _____

R.F.I. Number: _____

From: _____

To: _____

Date: _____

A/E Project Number: _____

Re: _____

Contract For: _____

Specification Section:

Paragraph:

Drawing Reference:

Detail:

Request:

Signed by:

Date:

Response:

☐ Attachments

Response From:

To:

Date Received:

Date Returned:

Copies: ☐ Owner

☐ Consultants

☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ File

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This Section includes progress payment procedures.
- B. Related Sections:
 - 1. Schedule of values is specified in Section 01 29 73.

1.02 APPLICATIONS FOR PAYMENT

- A. Payment Application Times: Each progress payment date shall be agreed to by the Owner.
- B. Payment Application Forms: Use AIA Document G702 and Continuation Sheets G703 as the form for Application for Payment.
- C. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.
 - 1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
 - 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- D. Transmittal: Submit PDF copy of each Application for Payment to the Architect including waivers of lien and similar attachments, when required.
- E. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of Mechanics Lien from every entity who may lawfully be entitled to file a mechanics lien arising out of the Contract, and related to the work covered by the payment.
 - 1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit final or full waivers.
 - 3. The Owner reserves the right to designate which entities involved in the work must submit waivers.
 - 4. Waiver Delays: Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.

5. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of work covered by the application who could lawfully be entitled to a lien.
 6. Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to Owner.
- F. Initial Application for Payment: Administrative actions and submittals that shall precede or coincide with submittal of the first Application for Payment include the following:
1. List of subcontractors.
 2. List of principal suppliers and fabricators.
 3. Schedule of Values.
 4. Contractor's Construction Schedule (preliminary if not final).
 5. Schedule of principal products.
 6. Schedule of unit prices, if any.
 7. Submittal Schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal consultants.
 10. Copies of building permits.
 11. Copies of authorizations and licenses from governing authorities for performance of the work.
 12. Initial progress report.
 13. Report of pre-construction meeting.
 14. Certificates of insurance and insurance policies.
 15. Performance and payment bonds (if required).
 16. Data needed to acquire Owner's insurance.
 17. Initial settlement survey and damage report, if required.
- G. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment. This application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the work.

1. Administrative actions and submittals that shall proceed or coincide with this application include:
 - a. Occupancy permits and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Test/adjust/balance records.
 - d. Maintenance instructions.
 - e. Meter readings.
 - f. Start-up performance reports.
 - g. Change-over information related to Owner's occupancy, use, operation and maintenance.
 - h. Final cleaning.
 - i. Application for reduction of retainage, and consent of surety.
 - j. Advice on shifting insurance coverage.
 - k. Final progress photographs.
 - l. List of incomplete work recognized as exceptions to Architect's Certificate of Substantial Completion.
- H. Final Payment Application: Administrative actions and submittals which shall precede or coincide with submittal of the final payment Application for Payment include the following:
 1. Completion of Project closeout requirements.
 2. Completion of items specified for completion after Substantial Completion.
 3. Assurance that unsettled claims will be settled.
 4. Assurance that work not complete and accepted will be completed without undue delay.
 5. Transmittal of required Project construction records to Owner.
 6. Certified property survey.
 7. Proof taxes, fees and similar obligations have been paid.
 8. Removal of temporary facilities and services.
 9. Removal of surplus materials, rubbish, and similar elements.
 10. Change of door locks to Owner's access.

New Village Arts Theatre
Carlsbad Village, CA

TWINSTEPS architecture
Project # IRV-21-230
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PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 29 73

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section specifies administrative and procedural requirements governing the preparation of a Schedule of Values.
- B. Related Sections:
 - 1. Payment procedures are specified in Section 01 29 00.

1.02 SCHEDULE OF VALUES

- A. Coordinate preparation of the Schedule of Values with preparation of the Construction Schedule.
- B. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
 - 1. Contractor's construction schedule.
 - 2. Application for Payment form.
 - 3. List of subcontractors.
 - 4. Schedule of allowances.
 - 5. Schedule of alternates.
 - 6. List of products.
 - 7. List of principal suppliers and fabricators.
 - 8. Schedule of submittals.
- C. Submit the Schedule of Values to the Architect at the earliest feasible date, but in no case later than 7-days before the date scheduled for submittal of the initial Application for Payment.
- D. Sub-Schedules: Where the work is separated into phases that require separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- E. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.

- b. Name of the Architect.
 - c. Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:
 - a. Generic name.
 - b. Related Specification Section.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that have affected value.
 - g. Dollar value.
 - h. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.
 3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.
 4. Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.
 5. For each part of the work where an Application for Payment may include materials or equipment, purchased, or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the work.
- F. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.
1. At the Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.
- G. Schedule Updating: Update and resubmit the Schedule of Values when Change Orders or Construction Change Directives result in a change in the Contract Sum.

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PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 01 31 13

PROJECT COORDINATION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
1. Coordination.
 2. Administrative and supervisory personnel.
 3. General installation provisions.
 4. Cleaning and protection.

1.02 COORDINATION

- A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
1. Where installation of one part of the work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
 2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
1. Prepare similar memoranda for the Owner and separate Contractors where 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 ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:
1. Preparation of schedules.
 2. Installation and removal of temporary facilities.
 3. Delivery and processing of submittals.
 4. Progress meetings.
 5. Project Close-out activities.

1.03 SUBMITTALS

- A. Coordination Drawings: Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.
 - 1. Show the interrelationship of components shown on separate Shop Drawings.
 - 2. Indicate required installation sequences.
 - 3. Comply with requirements contained in Section 01 33 00.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION PROVISIONS

- A. General: The provisions in this Article are in addition to and are intended to supplement specific installation requirements specified in other Sections.
- B. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- C. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- D. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- E. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
- F. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- G. Recheck measurements and dimensions, before starting each installation.
- H. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- I. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- J. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the application indicated. Refer questionable mounting height decisions to the Architect for final decision.

3.02 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
 - 1. Pre-Construction Conference.
 - 2. Pre-Installation Conferences.
 - 3. Coordination Meetings.
 - 4. Progress Meetings.
 - 5. Warranty Closeout Meeting.

1.02 PRE-CONSTRUCTION CONFERENCE

- A. Schedule a pre-construction conference and organizational meeting at the Project site no later than 15-days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B. Contractor shall take and distribute meeting notes to the attendees. Attendees taking exception to any item on the meeting notes shall notify the Contractor within 3-days following receipt.
- C. Attendees:
 - 1. Owner's Representative.
 - 2. Architect and applicable professional consultants.
 - 3. Contractor.
 - 4. Contractor's Superintendent.
 - 5. Major subcontractors.
 - 6. Others as appropriate.
- D. Agenda: Discuss items of significance that could affect progress including such topics as:
 - 1. Tentative construction schedule.
 - 2. Critical work sequencing.
 - 3. Designation of responsible personnel.
 - 4. Procedures for processing field decisions and Change Orders.
 - 5. Procedures for processing Applications for Payment.
 - 6. Distribution of Contract Documents.

7. Submittal of Shop Drawings, Product Data and Samples.
8. Preparation of record documents.
9. Use of the premises.
10. Office, work, and storage areas.
11. Equipment deliveries and priorities.
12. Safety procedures.
13. First aid.
14. Security.
15. Housekeeping.
16. Working hours.
17. CALGreen or other applicable Green Building requirements.

1.03 PRE-INSTALLATION CONFERENCES

- A. Conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The 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 the Architect of scheduled meeting dates.
- B. Review the progress of other construction activities and preparations for the activity under consideration at each pre-installation conference, including requirements for:
 1. Contract Documents.
 2. Options.
 3. Related Change Orders.
 4. Purchases.
 5. Deliveries.
 6. Shop Drawings, Product Data, and quality control Samples.
 7. Possible conflicts.
 8. Compatibility problems.
 9. Time schedules.
 10. Weather limitations.
 11. Manufacturer's recommendations.
 12. Compatibility of materials.
 13. Acceptability of substrates.

14. Temporary facilities.
 15. Space and access limitations.
 16. Governing regulations.
 17. Safety.
 18. Inspection and testing requirements.
 19. Required performance results.
 20. Recording requirements.
 21. Protection.
- C. Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner's Representative and Architect.
- D. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of work and reconvene the conference at the earliest feasible date.

1.04 PROGRESS MEETINGS

- A. Conduct progress meetings at the Project site at regularly scheduled intervals. Notify the Owner's Representative and Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- B. Attendees:
1. Owner's Representative.
 2. Architect and applicable professional consultants.
 3. Contractor.
 4. Contractor's Superintendent.
 5. Subcontractors as appropriate to the agenda.
 6. Suppliers as appropriate to the agenda.
 7. Others as appropriate to the agenda.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress, Include topics for discussion as appropriate to the status of the Project.
- D. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind 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.
- E. Review the present and future needs of each entity present, including such items as:

1. Interface requirements.
 2. Time.
 3. Sequences.
 4. Deliveries.
 5. Off-site fabrication problems.
 6. Access.
 7. Site utilization.
 8. Temporary facilities and services.
 9. Hours of work.
 10. Hazards and risks.
 11. Housekeeping.
 12. Quality and work standards.
 13. Change Orders.
 14. Documentation of information for payment requests.
- F. Reporting: Take and distribute copies of minutes of the meeting to each party present and to other parties who should have been present no later than 3-days after each progress meeting date. Include a summary, in narrative form, of progress since the previous meeting and report.
- G. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

1.05 WARRANTY CLOSEOUT MEETING

- A. Eleven months following date of Substantial Completion, hold a meeting to review warranties, bonds, and service and maintenance contracts for materials and equipment. Act as appropriate to implement, repair, or replace defective items and to extend service and maintenance contracts.
- B. Attending shall be:
1. Owner's Representative.
 2. Architect and professional consultants, as appropriate.
 3. Contractor.
 4. Subcontractor, as appropriate to the agenda.
 5. Suppliers, as appropriate to the agenda.
 6. Others, as appropriate to the agenda.

PART 2 - PRODUCTS

New Village Arts Theatre
Carlsbad Village, CA

TWINSTEPS architecture
Project # IRV-21-230
February 12, 2022

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- 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. Payment procedures are specified in Section 01 29 00.
 - 2. Operation and maintenance data are specified in Section 01 78 23.
 - 3. Project record documents are specified in Section 01 78 39.

1.02 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. Submit submittal items required for each Specification Section concurrently unless partial submittals for portions of the work are indicated on approved submittal schedule.
 - 3. 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 re-submittals, 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 re-submittals.
 - 1. Initial Review: Allow 15-days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15-days for review of each resubmittal.

4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is required, allow 21-days for initial review of each submittal.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15-days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- 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.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., Project Name-06 10 00.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., Project Name-06 10 00.01.A).
 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 software-generated form from electronic project management software or electronic form acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - f. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).

- g. Number and title of appropriate Specification Section.
 - h. Drawing number and detail references, as appropriate.
 - i. Location(s) where product is to be installed, as appropriate.
 - j. Other necessary identification.
 - k. Submittal and transmittal distribution record.
 - l. Remarks.
- D. Options: Identify options requiring selection by Architect.
- E. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- F. Re-submittals: Make re-submittals 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.
 - 4. The Architect will review up to one re-submittal. If more than one re-submittal is required, any associated costs resulting from additional reviews by the Architect will be charged to the Contractor and processed as a deductive Change Order in accordance with the General Conditions.
- 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

2.01 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
- 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. 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.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications.
- B. 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. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60-days of construction. List those submittals required to maintain orderly progress of the work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Name of subcontractor.
 - d. Description of the work covered.
 - e. Scheduled date for Architect's final release or approval.
 - f. Scheduled date of fabrication.
 - g. Scheduled dates for purchasing.
 - h. Scheduled dates for installation.
 - i. Activity or event number.

- C. 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 as a PDF electronic file.
- D. 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-inches x 11-inches, but no larger than 30-inches x 42-inches.
- 3. Submit Shop Drawings as a PDF electronic file.
- E. 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:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 - 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 that may be incorporated into the work are specified in individual Specification Sections. Such Samples shall be in an undamaged condition at time of use.
 - b. Samples not incorporated into the work, or otherwise designated as Owner's property, are the property of Contractor.

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 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. Mark up and retain one returned Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- F. Product Schedule: If specified in individual Specification Sections, prepare a written summary indicating types of products required for the work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule as a PDF electronic file.
- G. Coordination Drawing Submittals: Comply with requirements specified in Section 01 31 00.
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 29 00.
- I. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 77 00.

- J. Maintenance Data: Comply with requirements specified in Section 01 78 23.
- K. CalGreen Submittals: Comply with requirements specified in Section 01 35 15.
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding
 - 1. Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. 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.
- O. 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.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. 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.
- S. 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.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.

- 6. Test procedures and results.
- 7. Limitations of use.
- 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.

2.02 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If specified criteria are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file of certificate, signed, and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 – EXECUTION

3.01 CONTRACTOR'S REVIEW

- A. 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 01 77 00.

- 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.

3.02 ARCHITECT'S ACTION

- A. 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.
- B. Partial submittals prepared for a portion of the work will be reviewed when use of partial submittals has received prior approval from Architect.
- C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for re-submittal without review.
- D. Submittals not required by the Contract Documents may be returned by the Architect without action.
- E. Submittals requiring review by authorities having jurisdiction shall be made to the Architect for initial review prior to being submitted to the appropriate authority.

END OF SECTION

SECTION 01 35 15

GREEN BUILDING REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes general requirements and procedures for compliance with California Green Building Code requirements indicated on Drawing T1.1.
- B. Related Sections:
 - 1. Divisions 01 through 48 Sections, as applicable, for CALGreen requirements specific to the work of each of those Sections.

1.02 SUBMITTALS

- A. CALGreen submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CALGreen requirements.
- B. Contractor shall develop a spreadsheet or use one furnished by the building department to track submittals required by CALGreen.
- C. CALGreen Submittals:
 - 1. Furnish documentation showing verification of CALGreen compliance as required by enforcing agency.
 - 2. Section 4.408.2 – Construction Waste Management Plan: Furnish a construction waste management plan complying with specified requirements.
 - 3. Section 4.504.2 – Finish Material Pollutant Control: Furnish documentation showing compliance of finish materials, including adhesives, sealants and caulks, paints and coatings, carpet systems, resilient flooring systems and composite wood products. Comply with documentation requirements specified in Section 4.504.2.4 and 4.504.5.1.

1.03 SUMMARY OF CALGREEN REQUIREMENTS

- A. General: Comply with the following CALGreen requirements as applicable to the Project.
- B. Division 4.3 – Water Efficiency and Conservation:
 - 1. Section 4.303 - Indoor Water Use: Water closets, urinals, showerheads, and faucets shall comply with the requirements of Section 4.303.
 - 2. Section 4.304 - Outdoor Water Use: Irrigation controllers shall comply with the requirements of Section 4.304.
- C. Division 4.4 – Material Conservation and Resource Efficiency:

1. Section 4.406.1 – Enhanced Durability and Reduced Maintenance: Comply with the rodent proofing requirements specified in Section 4.406.1.
 2. Section 4.408 - Construction Waste Reduction, Disposal and Recycling: Comply with requirements specified in Section 4.408.
 - a. Recycled and/or salvage for reuse a minimum of 65-percent of the nonhazardous construction and demolition waste or meet a local construction and demolition waste management ordinance, whichever is more stringent.
 - b. Submit a construction waste management plan and update, as necessary.
 - 1) Identify the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project or salvage for future use or sale.
 - 2) Specify if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
 - 3) Identify diversion facilities where the construction and demolition waste material will be taken.
 - 4) Identify construction methods employed to reduce the amount of construction and demolition waste generated.
 - 5) Specify the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.
 - c. Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with Section 4.408.1.
 - d. Projects that generate a total combined weight of construction and demolition waste disposed of in landfills, which do not exceed 4-pounds per sq. ft. of building area shall meet the minimum 50-percent construction waste reduction requirement specified in Section 4.408.1.
 - e. Documentation shall be provided to the enforcing agency which demonstrated compliance with Section 4.408.2 Items 1 through 5, Section 4.408.3 or Section 4.408.4.
 3. Section 4.410 - Building Maintenance and Operation: Comply with the requirements specified in Section 4.410.
 - a. Operation and Maintenance Manual: At time of final inspection, provide an operation and maintenance manual complying with the requirements specified in Section 4.410.1.
- D. Division 4.5 – Environmental Quality:

1. Section 4.504 - Pollutant Control: Comply with the requirements specified in Section 4.504.
 - a. Cover duct openings and protect mechanical equipment during construction as specified in Section 4.504.1.
 - b. Finish materials shall comply with the requirement specified in Sections 4.504.2.1 thru 4.504.4, as follows:
 - 1) Adhesives, adhesive bonding primers, adhesive primers and caulks shall meet the following requirements:
 - a) Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable or SCAQMD Rule 1168 VOC limits as shown in Tables 4.504.1 and 4.504.2.
 - b) Aerosol adhesives and smaller unit sizes of adhesives, and sealant or caulking compounds shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of CCR Title 17, commencing with Section 94507.
 - 2) Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 4.504.3 unless more stringent local limits apply.
 - a) Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of CCR, Title 17, commencing with Section 94520 and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.
 - 3) Carpet shall meet the testing and product requirements of one of the following, as required by Section 5.504.4.4:
 - a) Carpet and Rug Institute's Green Label Plus Program.
 - b) California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350).
 - c) NSF/ANSI 140 at the Gold level.
 - d) Scientific Certifications Systems Sustainable Choice.
 - 4) Carpet cushion shall meet the requirements of the Carpet and Rug Institute Green Label program.

- 5) Carpet adhesive shall meet the requirements of Table 4.504.1.
- 6) At least 80% of floor area receiving resilient flooring shall meet at least one of the following:
 - a) VOC emission limits defined in the CHPS.
 - b) Products compliant with CHPS criteria certified under the Greenguard Children & Schools program.
 - c) Certification under the Resilient Floor Covering Institute (RFCI) FloorScore program.
 - d) Meet the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers", Version 1.1, February 2010 (Specification 01350).
- 7) Composite wood products, including hardwood plywood, particleboard and medium density fiberboard, used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.) by or before the dates specified in those sections, as shown in Table 4.504.5.

2. Indoor Moisture Control: Comply with the requirements specified in Section 4.505.
3. Indoor Air Quality and Exhaust: Comply with the requirements specified in Section 4.506.
4. Environmental Comfort: Comply with the requirements specified in Section 4.507.

E. Summary:

1. Certain CALGreen Measures needed to comply with code are dependent on material selections, documentation and means and methods of the work. Each item related to CALGreen may not be specifically identified as CALGreen requirements in this Section. Refer to CALGreen Code, CCR Title 24, Part 11 for complete descriptions of measures and submittal requirements.
2. Designate an onsite field staff person contact for all CALGreen prerequisites and credit documentation, subcontractor supervision and submittal coordination and to manage the Contractor's portions of the CALGreen submittal process.
3. Documentation for CALGreen Measures shall be submitted in the format required by the CALGreen code.
4. A copy of the CALGreen code, CCR Title 24, Part 11 shall be available on-site.
5. Additional information on CALGreen can be found at <http://www.bsc.ca.gov>.

F. Meetings:

1. Contractor shall conduct CALGreen compliance meetings as required. Contractor personnel who shall attend CALGreen compliance meetings include, but are not limited to:
 - a. Contractor's project manager.
 - b. Owner's Representative.
 - c. Other attendees designated by Owner's Representative.
 - d. Subcontractor representatives as appropriate to stage of work.
2. At a minimum, CALGreen compliance issues shall be discussed at the following meetings:
 - a. Preconstruction meetings.
 - b. Progress meetings.
 - c. Subcontractor meetings.
 - d. Meetings shall be scheduled as part of regularly scheduled job meetings on-site.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 - GENERAL

1.01 DEFINITIONS

- A. Testing Laboratory: An independent commercial testing organization, retained and paid by the Owner to perform tests and report on work as specified and as required.

1.02 TESTING LABORATORY

- A. General: Services of a Testing Laboratory are required for work specified in other Sections.
- B. Contractor's Responsibilities:
 - 1. Cooperate with Testing Laboratory personnel.
 - 2. Secure and deliver to the Testing Laboratory adequate quantities of representational samples of materials proposed for use for which testing is required.
 - 3. Furnish copies of product test reports as required.
 - 4. Furnish incidental labor and facilities:
 - a. To provide access to work to be tested.
 - b. To obtain and handle samples at the Project site or at the source of the product to be tested.
 - c. To facilitate inspections and tests.
 - d. For storage and curing of test samples.
 - 5. Notify the Architect sufficiently in advance of operations to allow for Testing Laboratory assignment of personnel and scheduling of tests.
 - a. When tests or inspections cannot be performed after such notice, reimburse the Owner for the Testing Laboratory personnel and travel expenses incurred.

1.03 TEST REPORTS

- A. The Testing Laboratory will distribute reports as follows:
 - 1. Architect: One copy.
 - 2. Applicable Consultant: One copy.
 - 3. Owner's Representative: One copy.
 - 4. Number of copies for Contractor and supplier will be determined upon commencement of the work.
 - 5. City and State agencies as appropriate.

1.04 RETESTING

- A. If the Architect has reasonable doubt that materials comply with Specification requirements, additional tests shall be made as directed.
 - 1. If additional tests establish that materials comply with Specification requirements, costs for such tests will be paid by the Owner.
 - 2. If additional tests establish that materials do not comply with Specification requirements, costs for such tests shall be paid by the Contractor.
- B. The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicated compliance with the Contract Documents.
 - 1. Cost of retesting shall be paid for by the Contractor.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish, install, and maintain temporary utilities as required to perform the work.
- B. Materials, installation, and maintenance of temporary utilities shall comply with applicable regulatory requirements.
- C. Existing building utilities may be used during construction if approved by the Owner's Representative.
- D. Remove temporary utilities, including associated materials and equipment when no longer required. Restore and recondition areas of the site damaged or disturbed by temporary utilities or their installation. Remove and properly dispose of debris resulting from removal and reconditioning operations.

1.02 TEMPORARY UTILITIES

- A. Temporary Electric Power and Lighting:
 - 1. Arrange with electric utility service company to provide service for power and lighting. Pay the costs for service and for power used.
 - 2. Distribute electric power and lighting.
 - 3. Provide lighting and convenience outlets in the temporary structures, and as otherwise required for the performance of the work.
- B. Temporary Heat and Ventilation:
 - 1. Provide and pay for heat devices and heat as required to maintain specified conditions for construction operations.
 - 2. The permanent heating system may be used as a source of temporary heat after system is placed in operation and tested, provided Owner's Representative has approved in writing use of the permanent system for temporary heat.
 - 3. Arrange for service, provide fuel and operators as required, pay costs in connection therewith, and maintain system until acceptance of the Project.
 - 4. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
 - 5. Building supply fans shall not be used unless required filters are in place.
- C. Temporary Lighting:
 - 1. Provide artificial lighting for work areas when natural light is not adequate to inspect work.
 - 2. Exterior staging and storage areas and pathways shall remain electrically illuminated after dark.

3. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

D. Temporary Water:

1. Arrange with utility service company to provide temporary water service and distribution; pay the costs for service and for water used.
2. Following permanent service installation, temporary water may be taken from permanent source.
3. Install branch piping with taps located so that water for construction purposes is available throughout the work by hoses.
4. Make potable water available for human consumption.

E. Temporary Sanitary Facilities: Locate as approved by the Owner. Maintain in a neat, sanitary condition, adequately supplied.

1.03 CONSTRUCTION AIDS

A. Plant and Equipment:

1. Furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting work and materials required under the Contract. Include tools, appliances, power equipment, and other required items.
2. Maintain plant and equipment in safe operating condition. Repair damages due to the use of defective plant and equipment, at no increase in Contract Sum.

1.04 BARRIERS AND ENCLOSURES

A. General:

1. Materials and construction shall comply with applicable regulatory requirements.
2. Provide and maintain suitable temporary barriers as required to prevent public entry; protect the work and existing facilities, and persons from damage or injury from construction operations.
3. Should regulatory requirements necessitate construction of temporary barriers, barricades, or pedestrian walkways not indicated or specified, construct at no increase in Contract Sum.
4. Install enclosure fencing with locking entrance gates where indicated or required to enclose site work. Provide open-mesh, chain-link fencing with posts.
5. Maintain temporary barriers in a structurally sound condition and neat appearance.
6. Relocate as required by progress of the work.
7. Restore and recondition site areas damaged or disturbed.

- B. Provide and maintain temporary enclosures to separate work areas from areas occupied by Owner and to prevent the penetration of dust and noise into occupied spaces.
 - 1. Construct with closed, sealed joints. Close or seal edges, penetrations, and intersections with other surfaces to prevent penetrations of dust and noise.
 - 2. Construct in accordance with fire-resistive requirements of regulatory agencies where indicated; maintain fire exits.
 - 3. Finish surfaces exposed to view in occupied areas as directed.

1.05 SECURITY

- A. Secure, maintain, and protect the work, stored materials, equipment, and temporary facilities until time of acceptance, or such earlier time as Owner may choose to assume such responsibility.
- B. Install temporary enclosure of partially completed construction areas to prevent unauthorized entrance, vandalism, and theft.
- C. Secure temporary storage areas as required to prevent theft.

1.06 TEMPORARY CONTROLS

- A. Noise and Vibration Control:
 - 1. Comply with applicable regulatory requirements for the operation of powered construction equipment.
 - 2. Equipment and impact tools shall have intake and exhaust mufflers.
 - 3. Secure written permission from Owner's Representative at least three working days prior to using noisy and vibratory equipment, such as jack-hammers, concrete saws, impact tools, and high frequency electrical equipment.
 - 4. Cooperate with Owner's Representative if the use of noisy equipment becomes objectionable.
- B. Dust and Dirt Control:
 - 1. Hauling equipment and trucks carrying loads of demolition debris shall have their loads covered with tarpaulins.
 - 2. Prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drains.
- C. Pollution Control:
 - 1. No burning of refuse, debris, or other materials will be permitted on or in the vicinity of the Project site.
 - 2. Comply with regulatory requirements and anti-pollution ordinances during the performance of demolition, construction and disposal operations.

1.07 PROJECT IDENTIFICATION AND SIGNS

- A. General: Project identification and signs shall be approved by the Owner's Representative.

1.08 FIELD OFFICES AND SHEDS

- A. Furnish, install, and maintain field offices and sheds.
- B. Existing space within the building may be used for a field office if approved by the Owner's Representative.
- C. If required, construct, install, and maintain field offices and sheds in compliance with applicable regulatory requirements.
 - 1. Construction shall be structurally sound, weathertight, with floors raised above the ground, sturdy doors with provisions for locking, temperature transmission resistance compatible with occupancy and storage requirements, and neat appearance maintained throughout duration of work.
 - 2. Portable or mobile buildings complying with the specified requirements may be used.
 - 3. Obtain Owner's Representative's approval of locations for field offices and storage sheds prior to commencing site preparation for the structures.
 - 4. Construct field offices and sheds on proper foundations and provide connections for utility services. Fill and grade sites for field offices and storage sheds to facilitate surface drainage.
- D. Remove field offices and sheds from the site as soon as the progress of the work permits. Remove foundations, steps, landings, utility services and contents. Grade and restore portions of the site occupied by the temporary structures.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interferences with performance of the work. Relocate and modify facilities as required by progress of the work.

END OF SECTION

SECTION 01 53 00

MOLD PREVENTION MEASURES

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes: Provide special administrative and procedural requirements to help prevent mold contamination in construction.
 - 1. Formation or presence of mold or fungi in a building is dependent upon a broad range of factors including, but not limited to:
 - a. Presence of spores and nutrient sources.
 - b. Moisture; temperatures; climatic conditions; relative humidity.
 - c. Heating/ventilating systems, maintenance, and operating capabilities.
 - 2. These factors are beyond control of Twinsteps Architecture who shall not be responsible for any claims, repairs, restoration, or damages relating to presence of any irritants, contaminants, vapors, fumes, molds, fungi, bacteria, spores, mycotoxins, etc. in any building or in the air, land, or water serving building.

1.02 QUALITY ASSURANCE

- A. Preconstruction Meeting: Review measures to prevent mold contamination at Preconstruction Meeting.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent mold contamination. Comply with manufacturer's written instructions where available relating to mold contamination prevention.
- B. Store materials off floor and cover with waterproof covering such as but not necessarily limited to insulation, gypsum products, wall coverings, carpet, wood products, and other products susceptible to mold contamination.
- C. Remove from Project site damaged materials or materials that have become wet. Do not install wet materials or materials with signs of mold contamination.

1.04 SITE CONDITIONS

- A. Maintain clean Project site, free from hazards, garbage, and debris.
- B. Flash roof penetrations immediately. Do not allow water to penetrate to floor below.
- C. Monitor humidity and temperature for conformance to installation requirements defined by material and equipment manufacturers.

- D. Check moisture content of gypsum board prior to applying finishes.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Remove materials that can support mold contamination and that are wet. Replace with new dry materials.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Roof Drains: Connect roof drains to risers and storm drainage lines as soon as possible.
- B. Floor Drains: Connect floor drains as soon as possible. Clean out floor drain lines to mains prior to Substantial Completion.
- C. Wall Assemblies: Install exterior wall insulation and gypsum board only after building is enclosed.
 - 1. Keep bottom of installed gypsum board off floor 1/2-inch.
 - 2. Protect gypsum board with polyethylene sheeting prior to placing gypsum cement underlayment.
- D. Cavity Conditions: Clean and inspect cavity conditions prior to covering, sealing, or restricting access. Vacuum clean cavity spaces prior to covering or enclosing.
- E. Plumbing: Pressure test plumbing piping identified as insulated on Project prior to installation of insulation.
- F. HVAC Equipment: Permanent HVAC equipment shall not be used for temporary conditioning of building during construction unless temporary disposable filters are in place.

3.02 DEMONSTRATIONS

- A. Train and educate Owner's maintenance personnel on use of building systems. Explain how improper operation and shutting down systems during off periods can create mold problems.
- B. Schedule with Owner a review of building for mold problems at one-year warranty walk-through.
 - 1. Inspect exterior sealants and masonry joints for cracks and other damage and deterioration where water can penetrate building envelope.

END OF SECTION

SECTION 01 61 00

COMMON PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- B. Administrative procedures for handling requests for substitutions made after award of the Contract are specified in Section 01 25 00.

1.02 DEFINITIONS

- A. "Products" are items purchased for incorporation in the work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- B. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturers' published product literature, current as of the date of the Contract Documents.
- C. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the work.
- D. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.03 SUBMITTALS

- A. Product List Schedule: Prepare a schedule showing products proposed to be installed in a tabular form acceptable to the Architect. Include generic names of products required. Include the manufacturer's name and proprietary product name for each item listed.
 - 1. Coordinate the product list schedule with the Contractor's Construction Schedule and the Schedule of Submittals.
 - 2. Form: Prepare the product listing schedule with information on each item tabulated under the following column headings:
 - a. Related Specification Section number.
 - b. Generic name used in Contract Documents.
 - c. Proprietary name, model number and similar designations.
 - d. Manufacturer's name and address.
 - e. Supplier's name and address.

- f. Installer's name and address.
- g. Projected delivery date, or time span of delivery period.
- 3. Initial Submittal: Within 30-days after date of commencement of the work, submit PDF copy of an initial product list schedule. Include an explanation for omissions of data and for known variations from Contract requirements.
- 4. Completed Schedule: Within 60-days after date of commencement of the work, submit PDF copy of the completed product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.
- 5. Architect's Action: The Architect will respond in writing to the Contractor within 2-weeks of receipt of the completed product list schedule. No response within this time constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architect's response will include the following:
 - 1. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.04 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
- B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also optional.
- C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturers or producers' nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.
 - 1. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
 - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
- B. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
- C. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- D. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- E. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
- F. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
- G. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
- H. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.01 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Do not use products having any of the following characteristics:
 - 1. Made outside the United States, its territories, Canada, or Mexico unless approved by the Owner.
 - 2. Made using or containing CFC's or HCFC's.
 - 3. Made of wood from newly cut old growth timber.
- C. Where all other criteria are met, Contractor shall give preference to products that:
 - 1. Are extracted, harvested, and/or manufactured closer to the location of the Project.
 - 2. Have longer documented life span under normal use.
 - 3. Result in less construction waste.
 - 4. Are made of vegetable materials that are rapidly renewable.

- D. CALGreen Product Requirements: As specified in Section 01 35 15.

2.02 PRODUCT SELECTION

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
1. Provide products complete with accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
 2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:
1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
 2. Semi-Proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.
 3. Where products or manufacturers are specified by name, accompanied by the term "or equal," or "or approved equal" comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
 4. Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
 5. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
 6. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
 7. Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with a code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
 8. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.

9. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work.
- B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 01 64 00

OWNER-FURNISHED PRODUCTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for the following:
 - 1. Providing utility and rough-in and installing Owner-furnished products.
 - 2. Provide utility and rough-in required for Owner-furnished and installed products.

1.02 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Store and handle products upright and in accordance with the manufacturer's instructions.
- B. Protect products as required to prevent damage during storage and construction.

PART 2 - PRODUCTS

2.01 GENERAL PRODUCT REQUIREMENTS

- A. Contractor's Responsibilities:
 - 1. Verify mounting and utility requirements for specified product items.
 - 2. Provide mounting and utility rough-in for product items where required, regardless of responsibility designation.
 - a. Rough-in locations, sizes, capacities, and similar type items shall be as indicated and required by product manufacturer.
 - b. If the Owner substitutes items like those scheduled, there shall be no change in rough-in cost, unless substitution occurs after rough-in has been completed or rough-in involves other mounting requirements, utilities or utilities of different capacity from that required by item originally specified.
 - 3. For products designated to be Owner furnished, the Owner will make available manufacturer's literature or information and shop drawings showing required mounting and rough-in information.
- B. Products furnished by the Owner, installed by the Contractor (OFCI)
 - 1. General: The Owner and the Contractor will coordinate deliveries to coincide with construction schedule.
 - 2. The Owner will furnish indicated or specified products with rough-in dimensions and characteristics indicated and tailgate deliver to the site.
 - 3. The Contractor Shall:

- a. Receive products at site and give written receipt at time of delivery, noting visible defects or omissions; if such declaration is not given, the Contractor shall assume responsibility for such defects and omissions.
 - b. Store products until ready for installation and protect from loss and damage.
 - c. Uncrate, assemble, and set in place.
 - d. Provide required backing plates.
 - e. Install products in accordance with manufacturer's recommendations, instructions, and shop drawings under supervision of manufacturer's representative where specified, supplying labor and material required and making mechanical, plumbing, and electrical connections required to operate products.
- C. Compatibility with Space and Service Requirements:
- 1. Products shall be compatible with space limitations indicated and with mechanical and electrical services indicated and specified in other Sections.
 - 2. Modifications to products required to conform with space limitations or with utility services specified for rough-in shall not cause additional cost to the Owner.
- D. Manufacturer's printed descriptions, specifications, and instructions shall govern the work unless specifically indicated or otherwise specified.
- E. Specifications, standards, tests, and recommended methods cited in this Section to govern use of items of equipment shall also govern component parts.

2.02 OWNER-FURNISHED PRODUCTS

- A. Owner-furnished products are indicated on the Drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install products in accordance with the manufacturers' instructions and the applicable requirements specified in other Sections.
- B. Set items securely in place, rigidly or flexibly mounted in accordance with manufacturer's directions.
- C. Securely attach to backing plates as required.
- D. Make electrical and mechanical connections as indicated and required.
- E. Touch-up and restore damaged or defaced finishes.

3.02 ADJUSTMENT, CLEANING, AND PROTECTION

- A. Repair or replace items not acceptable to the Architect.
- B. Upon completion of installation, clean products in accordance with manufacturers' recommendations, and protect from damage until final acceptance of the work.

3.03 TESTING

- A. Contractor-installed products shall be tested after installation in the presence of the Owner, Architect, and manufacturer.
- B. Correct defects or replace and retest as required. Repairs, replacement, and retesting shall be made at no additional cost to the Owner.

END OF SECTION

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for performing cutting and patching.
- B. Cutting and patching includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition.

1.02 SUBMITTALS

- A. If cutting and patching of existing roofing is required in the Project, furnish record of experience qualifying the roofing installation firm as a specialist in the installation of the existing system or similar system. Include a written record indicating Projects on which the installer has worked, with the name and address of the purchasers of the service and location of the work performed.

1.03 QUALITY ASSURANCE

- A. Structural Work: Do not cut and patch structural elements in a manner that would reduce their load carrying capacity or load deflection ratio.
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace work cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials shall be identical to existing materials. If identical materials are not available, use materials that visually match existing adjacent surfaces.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Before cutting existing surface, examine surfaces to be cut and patched and conditions under which cutting, and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

3.02 PREPARATION

- A. Temporary Support: Provide temporary support of work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
 - 1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
 - 2. Take precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible, review proposed procedures with the original installer; comply with the original installer's recommendations.
 - 1. Where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
 - 4. Bypass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
 - 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
 - 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch, after the patched areas has received primer and second coat.
5. Patch, repair or re-hang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.04 CLEANING

- A. Clean areas and spaces where cutting and patching is performed or used as access. Remove paint, mortar, oils, putty and similar materials. Clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original conditions.

END OF SECTION

SECTION 01 74 00

CLEANING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Perform cleaning and disposal operations during the progress and completion of the work.
- B. Cleaning for specific products or work is specified in the individual Specification Sections.
- C. Related Sections:
 - 1. Construction waste management is specified in Section 01 74 19.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with applicable regulatory requirements during cleaning and disposal operations.
- B. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
- C. Vacuum cleaners shall have high efficiency particulate arrester (HEPA) filters. Provide environmentally benign cleaning materials, which can be found at www.sustainable-cleaning.com and www.cleansolutions.com. Be especially careful during final touch-up and cleaning to ensure that cleaning crews do not deviate from the low or zero VOC content requirement for VOC-containing cleaning products.

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS

- A. Use cleaning materials which will not create hazards to health or property or cause damage to products.
- B. Use cleaning materials and methods recommended by the manufacturers of the products to be cleaned.
- C. Cleaning materials shall be clearly labeled.

PART 3 - EXECUTION

3.01 CLEANING DURING CONSTRUCTION

- A. Perform cleaning operations as required to keep the work, site, and adjacent properties free from accumulations of waste materials, rubbish, and windblown debris, resulting from construction operations.
- B. Provide on-site containers for the collection of waste materials, debris, and rubbish.
- C. Remove waste materials, debris, and rubbish from the site on a weekly basis or more often as conditions require and dispose of at legal disposal areas away from the site.
- D. Retain stored items in an orderly arrangement allowing access. Do not impede traffic or drainage.

3.02 DUST CONTROL

- A. Clean interior spaces prior to the start of finish painting and the application of other finishes and continue cleaning as required until such work is completed.
- B. Schedule cleaning operations to prevent dust and other contaminants from adhering to wet or newly finished surfaces.

3.03 FINAL CLEANING

- A. Employ experienced workers or professional cleaners for final cleaning. Comply with manufacturer's instructions.
- B. Remove labels that are not permanent.
- C. Clean transparent materials, including mirrors and glass in doors and windows, both interior and exterior. Remove glazing compound and other substances that are visible vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
- D. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Vacuum carpeted surfaces. Other flooring surfaces shall be mopped and/or cleaned in accordance with flooring manufacturer's recommendations.
- E. For surfaces requiring routine application of buffed polish, apply the polish recommended by the flooring manufacturer and polish.
- F. Clean permanent filters and replace disposable filters one week prior to building occupancy.
- G. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures, lamps, and bulbs. Clean out strainers after equipment start-up.
- H. Clean site, including landscape development areas of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth even textured surface.
- I. Remove temporary protection and facilities installed for protection of work during construction.
- J. Prior to final completion or Owner's occupancy, conduct an inspection of sight-exposed interior and exterior surfaces to verify that the entire work is clean and acceptable to the Owner.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.01 DESCRIPTION

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

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

1.02 DEFINITIONS

- A. Construction and Demolition Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Disposal: Removal off-site of construction and demolition waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- C. Recycle: Recovery of construction and demolition waste for subsequent processing in preparation for reuse.
- D. Salvage: Recovery of construction and demolition waste and subsequent sale or reuse in another facility.
- E. Salvage and Reuse: Recovery of construction and demolition waste and subsequent incorporation into the Work.

1.03 PERFORMANCE REQUIREMENTS

- A. General: Refer to CALGreen Code, CCR Title 24, Part 11, and Section 01 35 15.
- B. Recycled and/or salvage for reuse a minimum of 65-percent of the nonhazardous construction and demolition waste or meet a local construction and demolition waste management ordinance, whichever is more stringent.
- C. Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with CALGreen Section 5.408.1.2.
- D. Documentation shall be provided to the enforcing agency which demonstrated compliance with CALGreen Section 5.408.1.4.

1.04 SUBMITTALS

- A. Waste Management Plan: Submit a construction waste management plan and update as necessary. Where a local jurisdiction does not have a construction and demolition waste management ordinance that is more stringent, furnish a construction waste management plan including the following:
1. Identify the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project or salvage for future use or sale.
 2. Note whether construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
 3. Identify diversion facilities where the construction and demolition waste material will be taken.
 4. Identify construction methods employed to reduce the amount of construction and demolition waste generated.
 5. Specify the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.01 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until installation.
 4. Protect items from damage during transport and storage.
 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Not permitted on Project site.
- C. Salvaged Items for Owner's Use:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

3.02 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Receivers and Processors: Refer to www.wbdg.org/tools/cwm.php for information on available recycling receivers and processors.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 4. Store components off the ground and protect from the weather.
 5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.03 RECYCLING DEMOLITION WASTE

- A. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.
- B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 1. Pulverize concrete to maximum 1-1/2-inch (38-mm) size.
 2. Crush concrete and screen for use as satisfactory soil for fill or subbase.
- C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 1. Clean and stack undamaged, whole masonry units on wood pallets.
- D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

- E. Metals: Separate metals by type.
 - 1. Structural Steel: Stack members according to size, type of member, and length.
 - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- F. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- G. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
 - 1. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.
- H. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 - 1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- I. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- J. Plumbing Fixtures: Separate by type and size.
- K. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- L. Lighting Fixtures: Separate lamps by type and protect from breakage.
- M. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- N. Conduit: Reduce conduit to straight lengths and store by type and size.

3.04 RECYCLING CONSTRUCTION WASTE

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

B. Wood Materials:

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

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

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

3.05 DISPOSAL OF WASTE

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

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

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION

SECTION 01 74 23

CONSTRUCTION INDOOR AIR QUALITY

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section describes construction indoor air quality (IAQ) requirements and includes administrative and procedural requirements for the development and execution of a construction air quality management plan.
- B. Related Sections:
 - 1. Green building requirements are specified in Section 01 35 15.

1.02 IAQ REQUIREMENTS

- A. Indoor Contaminant Control during Construction: After installation, seal permanent ducts and vents to minimize contamination during construction. Remove any seals after phases of construction are completed.
- B. Preoccupancy Flush: Flush the building with fresh air, according to the following guidelines:
 - 1. Flush prior to occupancy but after construction is completed.
 - 2. Flush the entire building keeping interior doors open.
 - 3. Flush for 48 total hours; the hours may be nonconsecutive, if necessary.
 - 4. Keep windows open and run a fan (HVAC system fan) continuously or flush the building with HVAC fans and exhaust fans operating continuously at the highest flow rate.
 - 5. Use additional fans to circulate air within the building.
 - 6. Replace temporary HVAC air filters.

1.03 SUBMITTALS

- A. Cut sheets of filtration media used during construction and installed immediately prior to occupancy with MERV values highlighted.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for the following items of the Contract Closeout:

1. Project record documents.
2. Operating and maintenance data.
3. Service and maintenance contracts.
4. Preparation for final inspection.
5. Damage and restoration.
6. Remedial work.

1.02 PROJECT RECORD DOCUMENTS

A. Maintenance of Documents and Samples:

1. Store Project documents and samples in field office apart from documents used for construction.
2. Maintain Project documents in a clean, dry, legible condition and in good order.
3. Do not use Project record documents for construction.

B. Recording:

1. Record information carefully and neatly, with felt tip pens, in color code designated, and in the manner approved in advance by the Architect.
2. Label each document "Project Record" in large, neat, printed letters.

C. Record Drawings:

1. Record the following kinds of information on prints:
 - a. Changes made by Change Orders and other modifications described in the General Conditions.
 - b. Locations of work buried under or outside the building, such as plumbing and electrical lines and conduits.
 - c. Locations of work concealed inside the building whose general location is changed from that indicated on the Contract Documents.
 - d. Locations of items, not necessarily concealed, which have been changed, with the Architect's prior approval, from the locations indicated on the Contract Documents.

- e. Locations of significant items such as main power disconnect, main water and gas shutoffs, motor disconnects, filters, controls, isolating valves and the like shall be highlighted on the record drawings.
- f. In addition to the previously specified requirements for record drawings:
 - 1) Keep up to date during the entire progress of the work and make available to the Architect.
 - 2) Furnish additional drawings necessary for clarification.
 - 3) Record deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
 - 4) Establish locations of underground work by dimensions to column lines or walls, locating turns, and by referenced centerline or invert elevations and rates of fall.
 - 5) Give adequate information to locate work concealed in the building.
 - 6) Drawing to Scale:
 - a) Locate main runs of piping, conduit, ductwork, and similar items by dimensions.
 - b) Locate other items either by dimensions or in relation to spaces within the building.
- 2. Furnish record drawings, made from final Shop Drawings, updated to show actual conditions, for specified work.
- D. "As-Built" Drawings: At time of acceptance of the work and prior to final payment, using the record drawings for reference, prepare "As-Built" drawings.
- E. Specifications and Addenda: Mark each Specification Section to record:
 - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment incorporated in the work.
 - 2. Changes made by Change Order and other modifications described in the General Conditions.
- F. Large Scale Layout Drawings:
 - 1. The preparation of large-scale detailed layout drawings may be required for the work of Divisions 22, 23, and 26 of the Specifications. These layout drawings are not Shop Drawings as defined by the General Conditions, but, together with Shop Drawings or layout drawings of affected Sections, are used to check, coordinate, and integrate the work of the various Sections.
 - 2. If furnished, include the layout drawings as part of the Project record documents.
- G. Record Construction Schedule: Using the latest Progress Schedule required by Section 01 33 00 as a reference, submit a Record Construction Schedule showing the actual dates and duration of construction activities.
- H. Sign and date the completed Project record documents; deliver to the Architect who will deliver to the Owner's Representative after final acceptance of the work.

1.03 PRODUCT DATA

- A. Furnish PDF copy of manufacturers' product data, specifications, installation instructions, and maintenance instructions for products incorporated in the work; information specified herein shall be for products in addition to equipment items requiring operating and maintenance data specified elsewhere in this Section.
- B. Sign and date the completed product data, and submit to the Architect, who will deliver them to the Owner's Representative.

1.04 OPERATION TESTS

- A. Conduct operational tests as required to demonstrate that systems have been completed and comply with all requirements.
- B. Furnish a written record of test results using recording type instruments where applicable and as directed.

1.05 OPERATING AND MAINTENANCE DATA

- A. General: Where maintenance manuals, record data, and operating instructions are specified, include the following in PDF format:
 - 1. Typewritten index near the front of the manual indicating locations of emergency data for equipment included in the manual.
 - 2. Instructions regarding operation and maintenance of the equipment included in the manual.
 - 3. Replaceable parts, part numbers, cost, and name and address of nearest parts distributor.
 - 4. Copy of each warranty and service contract issued for the equipment included in the manual.
 - 5. Include additional data required for the Owner's operation and maintenance.
- B. Catalog Data: Where contents of manuals include manufacturers' catalog pages, indicate the items included in the Project and delete data that is not applicable.
- C. Shop Drawings: Furnish one PDF set of reviewed Shop Drawings showing changes made during construction.

1.06 SERVICE AND MAINTENANCE CONTRACTS

- A. Compile, review, and submit specified service and maintenance contracts as specified for warranties and bonds.

1.07 PREPARATION FOR FINAL INSPECTION

- A. Perform final cleaning as specified in Section 01 74 00.
- B. Assemble warranties, service, and maintenance contracts, operating and maintenance instructions, and other items as specified, and submit to the Architect.
- C. Remove temporary tapes, wrapping, coatings, paper labels, and other similar items. Dust, mop, wash, or wipe exposed and semi-exposed surfaces.

- D. At the Contractor's request, the Architect will attend a pre-final detailed Project review, to allow the Contractor to gather most punch list items while the subcontractors are still on the Project. Provide a typewritten list of items remaining to be completed or corrected. List by room number and item number. Segregate plumbing, HVAC, and electrical on separate lists.
- E. At the Contractor's request, the Architect will make a final Project review when the items in the pre-final punch list have been completed and after final cleanup, operation tests and the like have been performed.
- F. When the Architect determines that the Project is substantially complete and that final punch list items are completed, a final Project Inspection Report will be executed.
- G. Upon execution of the Final Project Inspection Report, record and pay for Notice of Completion and furnish copies to the Architect.
- H. Provide dates, duration, and methods used to conduct preoccupancy flush of at least 48 totals hours (may be nonconsecutive) prior to occupancy but after all phases of construction are completed. Ensure that HVAC filters are replaced or cleaned, as necessary.

1.08 RESTORATION OF DAMAGED WORK

- A. Restore or replace damaged materials and finishes caused by movement of equipment or other operations as specified or directed by the Architect, at no additional cost to the Owner.
- B. Restoration shall be equal to the original work, and finishes shall match the appearance of existing adjacent work.

1.09 REMEDIAL WORK

- A. Replace work due to faulty workmanship or materials at no additional cost to the Owner.
- B. Coordinate work with the Owner's Representative and perform at such time and manner to cause minimal interruption and inconvenience to the Owner's operations.

1.10 EXTRA MATERIALS

- A. Where specified, provide extra materials in the quantities and manner specified.
- B. Delivery and certification of extra materials shall be prerequisite to Substantial Completion.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Submittal procedures are specified in Section 01 33 00.
 - 2. Closeout procedures are specified in Section 01 77 00.
 - 3. Project record documents are specified in Section 01 78 39.
 - 4. Refer to Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the work in those Sections.

1.02 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.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.

- b. Enable inserted reviewer comments on draft submittals.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30-days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15-days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit PDF revised copy of each corrected manual within 15-days of receipt of Architect's comments and prior to commencing demonstration and training.
 - 2. Authorization for final payment will not be made prior to final acceptance of the Manual.

PART 2 – PRODUCTS

2.01 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

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

2.02 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Architect.
 - 7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 - 8. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.

2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

2.03 EMERGENCY MANUALS

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

5. Special operating instructions and procedures.

2.04 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
 1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

2.05 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.

2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

2.06 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name, and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.

4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 3 – EXECUTION

3.01 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.

2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of operation and maintenance manuals.
 2. Comply with requirements of newly prepared record drawings in Section 01 78 39.
- G. Comply with Section 01 77 00 for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01 78 36

WARRANTIES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This Section specifies general administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
- B. Specific requirements for warranties for the work and products and installations that are specified to be warranted, are included in the individual Sections of Divisions 02 through 48.
- C. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- D. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.02 DEFINITIONS

- A. Standard Product Warranties are pre-printed written warranties published by individual manufacturers for products and are specifically endorsed by the manufacturer to the Owner.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.03 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted work that has failed, remove, and replace other work that has been damaged from such failure or that must be removed and replaced to provide access for correction of warranted work.
- B. Reinstatement of Warranty: When work covered by a warranty has failed and has been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that work covered by a warranty has failed, replace, or rebuild the work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefited from use of the work through a portion of its anticipated useful service life.
- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- E. The Owner reserves the right to refuse to accept work for the Project where a special warranty, certification, or similar commitment is required on such work or part of the work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.04 SUBMITTALS

- A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the work, or a designated portion of the work, submit written warranties upon request of the Architect.
 1. When a designated portion of the work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen days of completion of that designated portion of the work.
- B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner's Representative for approval prior to final execution.
- C. Form of Submittal: At Final Completion compile PDF copy of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual. Use warranty form in Section 01 78 37.

PART 2 - PRODUCTS

Not Used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01 78 37

FORM OF WARRANTY

WARRANTY FOR _____.

We hereby warrant that all materials and equipment for the _____ that we have provided at _____ are new, unless otherwise specified, and that all work is of good quality, free from faults and defects and in conformance with the Contract Documents. Work not conforming to these requirements, including "equals" not properly approved and authorized, will be considered defective.

If within one year after the Date of Substantial Completion of the work or within one year after acceptance by the Owner of designated equipment, or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, a portion of the work is found to be defective or not in accordance with the Contract Documents, we agree to correct it promptly after receipt of a written notice from the Owner to do so; unless the Owner has previously issued a written acceptance of such condition. This obligation shall survive termination of the Contract.

If we fail to commence compliance with the above paragraph within 7 calendar days after receipt of written notice from the Owner to do so, or fail to pursue such compliance with diligence we, jointly and severally, do hereby authorize the Owner to have said defective work and damages repaired or replaced and made good at our sole expense, including compensation for the Owner's consultants' additional services made necessary by such default, and we will honor and pay the costs and charges for it together with interest at the maximum rate then permitted by governing obligations, and if the Owner brings action to enforce this warranty, we agree to pay the Owner's reasonable attorney's fees incurred in connection therewith. This warranty is for ____ years.

Signed _____
(subcontractor's name, address, license number, and date of signing)

Countersigned _____
(Contractor's name, address, license number, and date of signing)

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Sections:
 - 1. Submittal procedures are specified in Section 01 33 00.
 - 2. Closeout procedures are specified in Section 01 77 00.
 - 3. Operation and maintenance data are specified in Section 01 78 23.

1.02 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints.
 - 2) The Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal: Submit PDF electronic files of scanned record prints.
- B. Record Specifications: Submit Annotated PDF electronic files of Project Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
- D. Miscellaneous Record Submittals: Refer to other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities.
 - 1. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 – PRODUCTS

2.01 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. Accurately record information in an acceptable drawing technique.
 - b. Record data as soon as possible after obtaining it.
 - c. Record and check the markup before enclosing concealed installations.
 - d. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to the drawings.
 - b. Revisions to details shown on drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written direction.
 - l. Details not on the original Contract Documents.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the work that is shown only schematically.
 - 3. Mark the Contract Documents and shop drawings completely and accurately.
 - 4. Mark important additional information that was either shown schematically or omitted from original drawings.
 - 5. Note Construction Change Directive numbers, alternate numbers, Change Order numbers and similar identification where applicable.

- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Format: Annotated PDF electronic file with comment function enabled.
 - 2. 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.
 - 3. Identification:
 - a. Project name.
 - b. Data.
 - c. Designation "PROJECT RECORD DRAWINGS".
 - d. Name of Architect.
 - e. Name of Contractor.

2.02 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that specified, addenda, and contract modifications.
 - 1. Mark copy with the proprietary name and model number of products, materials and equipment furnished, including substitutions and product options selected.
 - 2. Record the name of manufacturer, supplier, installer, and other information necessary to provide a record of selections made.
 - 3. For each principal product, indicate whether record product data has been submitted in operation and maintenance manuals instead of submitted as record product data.
 - 4. Format: Submit record Specifications as annotated PDF electronic file or scanned PDF electronic files of marked-up paper copy of Specifications.

2.03 RECORD PRODUCT DATA

- A. Preparation: Mark product data to indicate the actual product installation where installation varies substantially from that indicated in product data submittal.
 - 1. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 2. Note related Change Orders, record Specifications and record drawings where applicable.
- B. Format: Submit record product data as annotated PDF electronic file or scanned PDF electronic files of marked-up paper copy of product data.
 - 1. Include record product data directory organized by Specification Section number and title, electronically linked to each item of record product data.

2.04 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file or scanned PDF electronic files of marked-up miscellaneous record submittals.

PART 3 – EXECUTION

3.01 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 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

SECTION 02 41 19

SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the following:
 - 1. Selective demolition and removal of portions of the existing building, as indicated and as required to perform the work.

1.02 DEFINITIONS

- A. Remove: Remove and legally dispose of items except those indicated to be salvaged or to remain the Owner's property.
- B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and bring to Owner's designated storage area within the building.
- C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in locations indicated.
- D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and then reinstalled in their original locations.

1.03 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the Project site.
- B. Coordinate with Owner's staff to identify any items to be returned to the Owner in lieu of disposal prior to demolition.

1.04 SUBMITTALS

- A. Proposed dust control measures.
- B. Proposed noise control measures.
- C. Schedule of selective demolition activities indicating the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 - 2. Interruption of utility services.
 - 3. Coordination for cutoff, capping, and continuation of utility services.
 - 4. Detailed sequence of selective demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
 - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed work.

- 6. Locations of temporary partitions and means of egress.
 - D. Inventory of items to be removed and salvaged, if any.
 - E. Inventory of items to be removed by Owner, if any.
 - F. Photographs or video, sufficiently detailed, of existing conditions, of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations.
 - G. Record drawings at Project closeout. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.
- 1.05 QUALITY ASSURANCE
- A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed selective demolition work like that required for this Project.
 - B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction. Comply with noise and dust regulations of authorities having jurisdiction.
 - C. Pre-Demolition Conference: Conduct conference at the Project site. Review methods and procedures related to building demolition including, but not limited to, the following:
 - 1. Inspect and discuss condition of existing building items to be demolished.
 - 2. Review and finalize schedule and verify availability of equipment, personnel, and facilities required.
 - 3. Review areas where existing construction is to remain and requires protection.
 - 4. Review methods for removing materials from the site.
 - 5. Review staging area for materials on the site.
- 1.06 ENVIRONMENTAL REQUIREMENTS
- A. Divert a minimum of 65-percent of construction and demolition waste from landfills.
- 1.07 PROJECT CONDITIONS
- A. Owner assumes no responsibility for actual condition of buildings to be selectively demolished. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - B. Hazardous Materials: It is not expected that asbestos or other hazardous materials will be encountered in the demolition work. If any materials suspected of containing asbestos or other hazardous materials are encountered, do not disturb the materials. Immediately notify the Architect and the Owner. The Owner will arrange to have hazardous materials removed under a separate contract.
 - C. Storage or sale of removed items or materials on-site will not be permitted.
- 1.08 SCHEDULING
- A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that utilities not to be re-used have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate, and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.
- E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.
- F. Perform surveys as the demolition work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES

- A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and governing authorities.
 - 2. Provide not less than 72-hours' notice to Owner if shutdown of service is required during changeover.
- B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving building to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

3.03 PREPARATION

- A. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
- B. Conduct demolition operations and remove debris to ensure minimum interference with streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
 1. Protect walls, ceilings, floors and other existing finish work that are to remain and are exposed during selective demolition operations.
- D. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of building to be selectively demolished.
 1. Strengthen or add new supports when required during progress of selective demolition.

3.04 POLLUTION CONTROLS

- A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.
 1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions.
- B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.05 SELECTIVE DEMOLITION

- A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete work within limitations of governing regulations and as follows:
 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 4. Maintain adequate ventilation when using cutting torches.
 5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 6. Dispose of demolished items and materials promptly. On-site storage of removed items is prohibited.

7. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.
 - B. Salvaged Items:
 1. Sort and organize salvaged materials as they are removed from the structure.
 2. Pack, crate or band materials to keep them contained and organized.
 3. Store items in a secure and weather protected area until removed from the site or transferred to Owner.
 4. Transport items to Owner's storage area designated by the Owner.
 5. Protect items from damage during transport and storage.
 - C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition activities. When permitted by the Architect, items may be removed to a suitable, protected storage location during demolition and cleaned and reinstalled in their original locations after demolition operations are complete.
 - D. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.
 - E. Remove air-conditioning equipment without releasing refrigerants.
- 3.06 DISPOSAL OF DEMOLISHED MATERIALS
- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from the Project site and legally dispose of them.
 1. Do not allow demolished materials to accumulate on site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 3. Remove debris from elevated portions of building by chute, hoist or other device that will convey debris to grade level in a controlled descent.
- 3.07 CLEANING
- A. Sweep the building broom clean on completion of selective demolition operation.
 - B. Change filters on air-handling equipment on completion of selective demolition operations.

END OF SECTION

SECTION 03 05 00

CONCRETE FLOOR SEALER

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes a clear concrete floor sealer where scheduled.

1.02 SYSTEM PERFORMANCE REQUIREMENTS

- A. Concrete floor sealer shall react with concrete surfaces to produce a dense, hydrophobic, insoluble, moisture barrier to seal out contaminants, while hardening and densifying concrete surface.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's product data and application and installation instructions.
- B. Warranty.

1.04 JOB CONDITIONS

- A. Ensure concrete has been cured a minimum of 3-days, is free of curing compounds and other sealers, and is free of laitance, grease, oil, and contaminants.
- B. Protect adjacent surfaces/areas from damage due to overspray.

1.05 WARRANTY

- A. Warranty sealed concrete floors to be free of dusting from abrasion for a period of 10-years from Substantial Completion. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 – PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. The Euclid Chemical Company "Ultrasil Li+", Laticrete / L&M "Seal Hard" or approved equal.

2.02 MATERIALS

- A. Concrete Sealer: Lithium silicate densifier; water based, deep penetrating, minimum 15-percent active ingredient solution containing lithium silicate designed to harden, densify, and dustproof concrete surfaces.
 - 1. VOC Content: Not more than 5 g/L.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Ensure surfaces are clean and free of all contaminants and any film forming compounds or sealers.
- B. Ensure concrete has been cured a minimum of 3-days.
- C. Test concrete surface for Ph levels and verify that Ph levels are acceptable to sealer manufacturer.

3.02 APPLICATION

- A. Apply concrete floor sealer to interior concrete floors where scheduled, in accordance with manufacturer's instructions.
- B. Apply directly from container onto prepared surfaces, undiluted.
- C. Apply at a minimum rate of 1-gallon per 150- to 200-sq. ft. unless otherwise recommended by sealer manufacturer.
- D. Allow surfaces to remain wet with sealer for 30- to 60-minutes.
- E. Remove excess sealer at end of application by water flushing and squeegeeing dry.
- F. Apply in one coat. Apply two coats to porous concrete surfaces.

END OF SECTION

SECTION 03 54 19

CONCRETE FLOOR UNDERLAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing the following where required to prepare existing surfaces to receive new applied floor coverings:

1. Concrete floor underlayment.
2. Self-leveling concrete floor underlayment.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation instructions for each product.

1.03 QUALITY ASSURANCE

- A. Manufacturer: Regularly providing underlayment materials of types specified or approved for not less than 5-years.
- B. Installer: Approved by underlayment manufacturer using approved equipment.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Maintain a temperature above 50-degrees F. until subfloor surface has stabilized.
- B. Provide continuous heat and mechanical ventilation until floor underlayment is dry.
- C. Follow manufacturer's additional requirements.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. Concrete Underlayment: Ardex, Inc. "Ardex SD-P Instantpatch", Bonsal B-1 Leveler" or approved equal.
- B. Self-Leveling Concrete Underlayment: Ardex, Inc. "Ardex K-15 Self-Leveling Underlayment Concrete", Bonsal "Self-Leveling Underlayment", Dayton Superior "LeveLayer I", Gyp-Crete "Level-Right", Quickcrete "Self-Leveling Floor Resurfacer" or approved equal.

2.02 MATERIALS

- A. Primer: As recommended by underlayment manufacturer.
- B. Concrete Underlayment: Underlayment shall have a minimum compressive strength of 4,200-psi at 28-days. Underlayment shall be able to be installed from featheredge to 1-inch and up to 3-inches with aggregate. Minimum thickness shall be 1/8-inch.

- C. Self-Leveling Underlayment: Underlayment shall have a minimum compressive strength of 4,000-psi at 28-days. Self-leveling underlayment shall be able to be installed from featheredge to any thickness in one pour.
- D. Aggregate: Well-graded, washed gravel for use when underlayment is installed over 1-1/2-inch thick; size of aggregate as recommended by manufacturer.
- E. Water: Clean and potable.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Surfaces to receive underlayment shall be solid, clean and properly primed.
- B. Concrete subfloors shall be clean and free of oil, grease, dirt, curing compounds, and other items that may act as bond breakers. Mechanically clean if required using shot-blasting; acid etching is not acceptable.
- C. Where required, grind high spots in concrete subfloors as recommended by manufacturer.
- D. Non-porous surfaces such as tile shall be clean and free of wax and sealers.
- E. Repair cracks in the subfloor to prevent telegraphing through the underlayment.

3.02 INSTALLATION

- A. Prime subfloor in accordance with manufacturer's recommendations. Do not leave any bare spots and remove puddles and excess primer. Do not apply underlayment until primer is dry.
- B. Mixing Ratios: In accordance with manufacturer's instructions.
- C. Place underlayment using a wood or magnesium float. When underlayment begins to harden, finish with a steel trowel.
- D. Pour or pump self-leveling liquid underlayment and spread in place. Comply with manufacturer's instructions.
- E. Prohibit foot traffic until underlayment is dry.

3.03 COMPLETION

- A. When complete, underlayment shall be finished to a reasonably smooth and uniform condition, and be free from pin holes, gouges, cuts, and other damage or defects.
- B. Transition between finish surfaces of underlayment and adjacent existing flooring shall be free from offsets.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing metal fabrications made from steel shapes, plates, bars, strips, tubes, pipes, and castings not a part of structural steel or specified in other Sections, including but not limited to the following items:
1. Miscellaneous steel framing for partition supports.
 2. Angle corner guards and edge guards; painted and galvanized.
 3. Countertop braces.
 4. Guardrails, railings, and handrails.
 5. Artwork Space ceiling pipe grid assembly.
 6. Supports for wood trellis members.
 7. Supports for roof-mounted mechanical equipment screens.
 8. Steel pipe bollards.
 9. Miscellaneous angles, plates, bars, rods, and other items not specified in other Sections but shown or required to complete the work.
- B. Related Sections:
1. Metal ladders are specified in Section 05 51 33.
 2. Painting is specified in Section 09 91 00.

1.02 SYSTEM PERFORMANCE REQUIREMENTS

- A. Guardrails, Railings and Handrails: Design, engineer, fabricate and install guardrails, railings, and handrails to withstand the following structural loads:
1. Top Rail of Railing System: Capable of withstanding a lateral load of 50-psf applied horizontally at right angles to the top rail.
 2. Handrails: Capable of withstanding a load of 200-psf applied at any direction and point along the handrail.
 3. Handrails and Railings shall comply with ADA requirements.

1.03 SUBMITTALS

- A. Product Data: Include information on stair treads, paint products, and grout.
- B. Shop Drawings: Include plans, elevations and details of metal fabrications and their connections. Show anchorage and accessory items. Furnish templates for anchors and bolts installed under other Sections.

1.04 QUALITY ASSURANCE

- A. Stairway handrails shall comply with California Building Code (CBC) Section 11B-505 and 1012.
- B. Ramp handrails shall comply with CBC Section 11B-505 and 1012.
- C. Ramp guardrails shall comply with CBC Section 11B-505 and 1013.
- D. Fabricator Qualifications: Firm experienced in successfully producing metal fabrications like that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the work.
- E. Welding Qualifications: Qualify welding processes and welding operators in accordance with AWS D1.1, D1.2, and D1.3 as applicable. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved.

1.05 PROJECT CONDITIONS

- A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule to avoid delay of work.

1.06 SEQUENCING AND SCHEDULING

- A. Painting: Items specified in this Section as having a shop applied prime coat will be job painted as specified in Section 09 91 00, unless otherwise noted.

PART 2 - PRODUCTS

2.01 FERROUS METALS

- A. General: For fabrication of metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- B. Steel Plates, Shapes and Bars: ASTM A36.
- C. Steel Tubing: Cold-formed, ASTM A500; or hot-rolled, ASTM A501.
- D. Structural Steel Sheet: Hot-rolled, ASTM A570; or cold-rolled ASTM A611, Class 1.
- E. Galvanized Structural Steel Sheet: ASTM A653, galvanized in accordance with ASTM A525, G90 coating designation.
- F. Steel Pipe: ASTM A53; type and grade selected by fabricator; black finish unless galvanizing is indicated or specified; standard weight, schedule 40, unless otherwise indicated.
- G. Gray Iron Castings: ASTM A48, Class 30.
- H. Malleable Iron Castings: ASTM A47, grade selected by fabricator.

2.02 ALUMINUM

- A. Extrusions: ASTM B221, alloy 6063-T6.
- B. Sheet: ASTM B209, alloy 5005-H15.
- C. Bars, Rods and Wires: ASTM B211.

- D. Drawn Seamless Tubing: ASTM B210.
- E. Castings: ASTM B26 or B108, alloy 214 unless otherwise recommended by aluminum producer or finisher.

2.04 STAINLESS STEEL

- A. Tubing: ASTM A554, grade MT 304.
- B. Pipe: ASTM A312, grade TP304.
- C. Castings: ASTM A743, Grade CF 8 or CF 20.
- D. Plate: ASTM A167, type 304.
- E. Finish: No. 4 satin polish finish matching approved sample.

2.05 FASTENERS

- A. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A, with hex nuts, ASTM A563, and flat washers.
- B. Machine Screws: ANSI B18.6.3.
- C. Lag Bolts: ANSI B18.2.1.
- D. Wood Screws: Flat head, carbon steel, ANSI B18.6.1.
- E. Plain Washers: Round, carbon steel, ANSI B18.22.1.
- F. Lock Washers: Helical, spring type, carbon steel, ANSI B18.21.1.
- G. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete, determined in accordance with ASTM E448.

2.06 GROUT

- A. Non-Shrink Non-Metallic Grout: Euclid Chemical Co. "Euco N-S Grout", Laticrete / L&M Construction Chemicals, Inc. "Crystex", Master Builders Technologies, Inc. "Masterflow 928 and 713" or approved equal.

2.07 PAINT

- A. Metal Primer: SSPC 20, Type 2; VOC-compliant.
 - 1. Exposed to view items to be field painted shall be primed with a primer compatible with final finish coats specified in Section 09 91 00.
- B. Galvanizing Repair Paint: VOC-compliant, high zinc dust content paint for re-galvanizing welds in galvanized steel; Rust-Oleum Corp. "Zinc-Rich Cold Galvanizing Compound", Tnemec 90-93, ZRC Worldwide "Galvalite" or approved equal.

2.08 FABRICATION, GENERAL

- A. Workmanship:

1. Use materials of size and thickness indicated or required to produce strength and durability in finished product for use intended.
 2. Work to dimensions indicated,
 3. Form exposed work true to line and level with accurate angles and surfaces and straight, sharp edges.
 4. Ease exposed edges to a radius of approximately 1/32-inch, unless otherwise indicated.
 5. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
 6. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces. Welds shall be imperceptible in the finished work.
 7. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use Phillips flat-head countersunk screws or bolts for exposed fasteners unless tamperproof security screws are indicated.
 8. Cut, reinforce, drill, and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
- B. Galvanizing: Provide zinc coating for all exterior items exposed to the elements, as follows:
1. ASTM A153 for galvanizing iron and steel hardware.
 2. ASTM A123 for galvanizing both fabricated and un-fabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299-inch thick and heavier.
- C. Fabricate joints exposed to the weather to exclude water or provide weep holes.
- D. Shop Painting:
1. Shop paint miscellaneous metal work, except members or portions of members to be embedded in concrete or masonry, surfaces, and edges to be field welded, and galvanized surfaces.
 2. Remove scale, rust, and other deleterious materials before applying shop coat. Clean off heavy rust and loose mill scale in accordance with SSPC SP-2, SP-3, or SP-7.
 3. Remove oil, grease, and similar contaminants in accordance with SP-1.
 4. Brush or spray on primer in accordance with manufacturer's instructions, at a rate of 2.0-mils thickness for each coat.
 5. Apply one shop coat to fabricated metal items, except apply 2-coats to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish from the first.
 6. Primer on exposed to view items to be field painted shall be smooth and suitable for application of final finish coats specified in Section 09 91 00.
 7. Apply a heavy coat of bituminous paint, compounded for application in 30-mil coat, to metal surfaces in contact with concrete, masonry, and dissimilar metals. Do not apply on exposed surfaces.

2.10 MISCELLANEOUS METAL FABRICATIONS

A. Miscellaneous Framing and Supports:

1. Provide miscellaneous framing and supports not a part of structural steel framework, as required to complete work.
2. Fabricate to sizes, shapes and profiles shown or required.
3. Fabricate from structural steel shapes and plates and steel bars of welded construction using mitered joints for field connection.
4. Cut, drill, and tap units to receive hardware and similar items.
5. Finish: Galvanize exterior frames and supports, shop prime interior frames, and supports.

B. Steel Guardrails, Railings and Handrails: Fabricate to design, dimensions and details indicated. Railings and handrails shall comply with ADA requirements.

1. Interconnect railing and handrail members by butt welding or welding with internal connectors.
2. Provide coped joints at tee and cross sections.
3. Form simple and compound curves by bending tubing in jigs to produce uniform curvature for each repetitive configuration. Maintain cylindrical cross-section of tube throughout entire bend without buckling, twisting, or deforming exposed surfaces.
4. Provide wall returns at ends of wall-mounted handrails.
5. Close exposed ends of tubing by welding 3/16-inch steel plate in place or by using prefabricated fittings.
6. Flanges, Fittings and Anchors: Provide end closures, flanges, miscellaneous fittings, and anchors for interconnections of tubing and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry.
7. Finish: Galvanize exterior steel guardrails, railings, and handrails, including tubing, fittings, brackets, fasteners, and other ferrous components. Provide shop-primed metal for interior guardrails, railings, and handrails. Guardrails, railings, and handrails will be field painted as specified in Section 09 91 00.

C. Steel Pipe Bollards: Fabricate bollards from galvanized steel pipe of diameter and height indicated. Embed in concrete footings, fill with concrete and close top end by welding a 1/4-inch steel plate in place or provide a smooth concrete domed cap. Bollards will be field painted as specified in Section 09 91 00.

PART 3 - EXECUTION

3.01 PREPARATION

- #### A.
- Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors.

3.02 INSTALLATION

- #### A. General:

1. Fastening to in-Place Construction: Provide threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
 2. Cutting, Fitting and Placement:
 - a. Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications.
 - b. Set work accurately in location, alignment, and elevation, plumb, level, true and free of rack, measured from established lines and levels.
 - c. Provide temporary bracing or anchors in formwork for items to be built into concrete, masonry, or similar construction.
 3. Fit exposed connections together forming tight hairline joints.
 - a. Weld connections not shop-welded.
 - b. Grind exposed joints smooth and imperceptible, and touch-up shop paint coat.
 - c. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and intended for bolted or screwed field connections.
 4. Field Welding: Comply with AWS for procedures of manual shielded metal-arc welding, appearance and quality of welds, and methods used in correcting welding work.
- B. Steel Guardrails, Railings and Handrails:
1. Adjust railings prior to anchoring to ensure matching alignment at abutting joints.
 2. Space posts as indicated.
 3. Plumb posts in each direction.
 4. Secure handrails to wall with wall brackets and end fittings.
 - a. Locate brackets as indicated.
 - b. Secure wall brackets in accordance with manufacturer's instructions.
 5. Expansion Joints: Provide at intervals not exceeding 40-feet. Provide slip joint with internal sleeve extending 2-inches beyond joint on either side; fasten internal sleeve securely to one side; locate joint within 6-inches of posts.
- C. Bollards: Anchor bollards in concrete with preset pipe sleeves or expansion bolts and base plate, as indicated. After bollards have been inserted into sleeves, fill annular space between bollard and sleeve solid with non-shrink, non-metallic grout.
- 3.03 ADJUST AND CLEAN
- A. Touch-Up Painting: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0-mils.
 - B. Galvanized Surfaces: Clean field welds, bolted connections and abraded areas and spot prime with specified primer applied to a minimum dry film thickness of 2.5-mils.

END OF SECTION

SECTION 05 51 33

METAL LADDERS

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for providing the following types of ladders:

1. Aluminum ships ladder for mezzanine access.

B. Related Sections:

1. Metal fabrications are specified in Section 05 50 00.

1.02 SUBMITTALS

A. Product Data: Manufacturer's specifications and installation instructions.

B. Shop Drawings: Include plans, elevations, sections and details of components and connections.

1.03 QUALITY ASSURANCE

A. Ladders shall comply with OSHA/ANSI A14.3 standards.

PART 2 - PRODUCTS

2.01 ALUMINUM SHIPS LADDERS

A. Approved Manufacturer: FS Industries "Steep Incline Aluminum Ships Ladder" Model FTSL24110-AL or approved equal.

B. Configuration: 68-degree angle of rise.

C. Construction:

1. Heavy duty aluminum I bar grating stair treads, 6-inches deep.

2. Factory welded 1-1/2-inch x .125-inch aluminum 6063-T52 square tubing walk-thru handrails.

3. 10-inch x 2.6-inch aluminum 6061-T6511 structural channel stringers.

4. 24-inch-wide treads, 29-1/4-inch overall stair width.

D. Assembly Hardware: Stainless steel.

E. Finish: Clear anodized handrails, other parts mill finish.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Fastening to in-Place Construction: Provide anchorage devices and fasteners for securing to in-place construction.
- B. Install ladders accurately in location, alignment, and elevation, and plumb.

END OF SECTION

SECTION 06 16 43
GYPSUM SHEATHING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes exterior gypsum sheathing, fasteners, and accessories.
- B. Related Sections:
 - 1. Plastic sheet air barriers are specified in Section 07 27 19.
 - 2. Gypsum board is specified in Section 09 29 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's descriptive literature indicating material composition, thickness, size and fire resistance. Include manufacturer's certification that gypsum sheathing complies with specified fire-resistance requirements.
- B. Shop Drawings: Show fastener patterns and installation details.

1.03 QUALITY ASSURANCE

- A. Fire Resistance Ratings: Gypsum sheathing shall have a flame spread of 0 and smoke developed of 0 when tested in accordance with ASTM E84 and be non-combustible when tested in accordance with ASTM E136.
- B. Gypsum sheathing shall be manufactured to conform to the physical requirements of ASTM C79 for gypsum sheathing board and shall have the following performance characteristics.

	1/2" thick Sheathing	5/8" thick Sheathing
Thickness	1/2" +/- 1/32"	5/8" +/- 1/32"
Weight, lbs/sg. ft.	1,900	2,500
Width, nominal	4 feet +/- 1/8"	4 feet +/- 1/8"
Length, standard	8 feet and 10 feet, +/- 1/4"	8 feet and 10 feet, +/- 1/4"
Edges	Square	Square
Core	Water resistant	Water resistant
Permeance, ASTM E96	23.1 perms	12.4 perms

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Keep materials under cover and dry. Protect against exposure to weather and contact with wet or damp surfaces.
- B. Stack gypsum sheathing and provide for air circulation within and around stacks and under temporary coverings.

PART 2 - PRODUCTS

2.01 GYPSUM SHEATHING

- A. Gypsum Sheathing: Georgia Pacific "DensGlass Sheathing" or approved equal panel with glass mat faced water-resistant treated core, 5/8-inch thick unless otherwise indicated, complying with ASTM C1177.

1. Gypsum wall sheathing shall be resistant to mold and mildew when tested in accordance with ASTM D3273.
 2. Where indicated for fire-rated walls, provide Georgia Pacific "DensGlass Fireguard Sheathing" or approved equal glass mat faced water-resistant treated core panel, 5/8-inch thick, with Type X rating as defined in ASTM C1396.
- B. Fire Resistance:
1. Noncombustible when tested in accordance with ASTM E136.
 2. Flame spread 10, smoke developed 0, when tested in accordance with ASTM E84.
- C. When tested in accordance with ASTM E119, 5/8-inch sheathing applied to a partition in a single-layer nail application on each face of load-bearing wood framing members provided a one-hour fire resistance, qualifying it for the "Type X" designation of ASTM C79.

2.02 MISCELLANEOUS MATERIALS

- A. Fasteners: Provide bugle or wafer head, self-tapping, corrosion-resistant, fine thread fasteners as recommended by gypsum sheathing manufacturer. Fasteners shall have a minimum 1,000-hour resistance to salt spray when tested in accordance with ASTM B117.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

- A. Cut and fit gypsum sheathing accurately. Install members plumb and true to line and level.
- B. Securely attach to substrate by anchoring and fastening as indicated and required.
- C. Use fasteners of appropriate type and length.

3.02 GYPSUM SHEATHING

- A. Fasten to exterior face of stud framing for exterior walls in accordance with manufacturer's instructions, applicable instructions in GA-253 and ASTM C1280.
- B. Use maximum lengths possible to minimize number of joints.
- C. Fasten with screws of appropriate type and length.
- D. Attach sheathing to metal framing with screws spaced 8-inches o.c. at perimeter where there are framing supports and 8-inches o.c. along intermediate framing in field.
- E. Drive fasteners to bear tight against and flush with surface of sheathing. Do not counter sink.
- F. Locate fasteners minimum 3/8-inch from edges and ends of sheathing panels, tight against and flush with surface of sheathing.

END OF SECTION

SECTION 06 40 13

EXTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing exterior architectural woodwork items including the following:
 - 1. Exterior millwork and trim.
 - 2. Exterior wood trellis members.
- B. Related Sections:
 - 1. Metal fabrications are specified in Section 05 50 00.
 - 2. Interior architectural woodwork is specified in Section 06 40 23.
 - 3. Architectural wood casework is specified in Section 06 41 00.
 - 4. Fiber cement lap siding is specified in Section 07 46 48.
 - 5. Painting is specified in Section 09 91 00.

1.02 SUBMITTALS

- A. Product data for each type of product and process specified in this Section and incorporated into items of architectural woodwork during fabrication, finishing, and installation.
- B. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- C. Samples for verification purposes of the following:
 - 1. Lumber for transparent finish in form of exterior wood stain, 50-square inches, for each species, with one half of exposed surface finished with coating specified in Section 09 91 00.
 - 2. Lumber and panel products for factory-applied opaque finish, 8-1/2-inches by 11-inches for panels and 50-square inches for lumber, for each finish system and color, with one half of exposed surface finished with coating specified in Section 09 91 00.
- E. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, and other information specified.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Firm experienced in successfully producing architectural woodwork like that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the work.
- B. Single-Source Responsibility for Fabrication and Installation: Engage a qualified manufacturer to assume undivided responsibility for woodwork specified in this Section, including fabrication and installation.

- C. Installer Qualifications: Arrange for installation of architectural woodwork by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.

1.05 PROJECT CONDITIONS

- A. Environmental Limitations: Obtain and comply with woodwork manufacturer's and installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage.
- B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions will permit work to be performed and at least one coat of finish applied without exposure to rain or dampness.
- C. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of work.
 - 1. Where field measurements cannot be made without delaying the work, guarantee dimensions and proceed with manufacture of woodwork without field measurements. Coordinate other construction to ensure that actual dimensions correspond to guaranteed dimensions.

1.06 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, reinforcements, and other related items to ensure that exterior woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.01 INSTALLATION MATERIALS

- A. Blocking, Shims and Nailers: Softwood or hardwood lumber, kiln dried to less than 15-percent moisture content.
- B. Screws: Stainless steel; type and size required.
- C. Nails: Stainless steel or hot dip galvanized; type and size as required for each use.
- D. Anchors: Stainless steel or hot dip galvanized; type and size required for each substrate for secure anchorage.

2.02 FABRICATION GENERAL

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of lumber in relation to relative humidity conditions existing during time of fabrication and in installation areas.
- B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Edges of solid wood (lumber) members less than 1-inch in nominal thickness: 1/16-inch.
 2. Edges of rails and similar members 1-inch or more in nominal thickness: 1/8-inch.
 - C. Complete fabrication, including assembly, finishing, and hardware application, before shipment to project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - D. Shop-cut openings, to maximum extent possible, to receive hardware, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and seal edges with a water-resistant coating suitable for exterior applications.
- 2.03 EXTERIOR MILLWORK AND TRIM FOR OPAQUE FINISH
- A. Backout or groove backs of flat trim members, kerf backs of other wide flat members, except for members with ends exposed in finished work.
 - B. Assemble casings in plant except where limitations of access to place of installation require field assembly.
 - C. Lumber Species: Clear Douglas Fir, smooth finish.
 - D. Finish: Field-applied paint finish as specified in Section 09 91 00.
- 2.04 EXTERIOR WOOD TRELLIS MEMBERS FOR TRANSPARENT FINISH
- A. Lumber Species: Clear Western Red Cedar, smooth finish.
 - B. Finish: Field-applied stain finish as specified in Section 09 91 00.
 - C. Metal Supports: As specified in Section 05 50 00.
- 2.05 SHOP PRIMING
- A. Woodwork for Transparent Finish: Shop seal woodwork for transparent finish with stain, if required, and first coat of finish specified in Section 09 91 00.
 - B. Woodwork for Opaque Finish: Shop prime woodwork for paint finish with one coat of wood primer specified in Section 09 91 00.
 - C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations.
 - D. Backpriming: Apply one coat of sealer or primer compatible with finish coats to concealed surfaces of woodwork, including back. Apply two coats to items installed over concrete or masonry.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.

- B. Deliver concrete inserts and similar anchoring devices to be built into substrates well in advance of time substrates are to be built.
- C. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.02 INSTALLATION

- A. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 8'-0" for plumb and level and with no variations in flushness of adjoining surfaces.
- B. Scribe and cut woodwork to fit adjoining work.
- C. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork.
- D. Millwork and Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns and miter at corners.
- E. Refer to Section 09 91 00 for final finishing of installed architectural woodwork.

3.03 ADJUSTMENT AND CLEANING

- A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean woodwork on exposed and semi-exposed surfaces.

3.04 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, that ensure that woodwork is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 06 40 23

INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing interior architectural woodwork items including the following:
 - 1. Millwork and trim.
 - 2. Door frames.
- B. Related Sections:
 - 1. Exterior architectural woodwork is specified in Section 06 40 13.
 - 2. Architectural wood casework is specified in Section 06 41 00.
 - 3. Flush wood doors are specified in Section 08 14 16.
 - 4. Field-applied finishes are specified in Section 09 91 00.

1.02 SUBMITTALS

- A. Shop Drawings: Show details of fabrication and installation, dimensioned plans, elevations, and sections.
 - 1. Shop drawings shall comply with North American Architectural Woodwork Standards (NAAWS 4.0) Section 01 – Submittals for each type of interior architectural woodwork item required for the Project.
 - 2. Apply a Woodwork Institute Certified Compliance Label to the first page of the shop drawings.
- B. Samples:
 - 1. Samples shall comply with NAAWS 04, Section 01.7.
 - 2. Veneer leaves representative of and selected from flitches to be used for transparent finished woodwork.
 - 3. Wood veneer panel products, with or for transparent finish, 12-inches by 12-inches for each finish system and color. Provide multiple samples if required to represent the color and grain to be expected in the Project.
 - 4. Lumber products, with or for transparent finish, 3-1/2-inch x 12-inch for each finish system and color. Provide multiple samples if required to represent the color and grain to be expected in the Project.
 - 5. Corner pieces of miter joints for standing trim.
- C. Product certificates signed by woodwork manufacturer certifying that products comply with specified requirements.

- D. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, and other specified information.

- E. Warranty.

1.03 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm experienced in producing architectural woodwork similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the work.
- B. Installer Qualifications: Arrange for interior architectural woodwork installation by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this Project.
- C. NAAWS Inspection / Certification:
 - 1. Before delivery to the Project site, provide a certification of compliance with NAAWS 04 standards issued by AWMAC or WI.
 - 2. Upon completion of installation, furnish a compliance certificate for the installation.
 - 3. In the event of question as to compliance with the referenced standard of any item of work, the Architect may require independent inspection service of questioned items.

1.04 ENVIRONMENTAL QUALITY ASSURANCE

- A. All wood products shall be FSC Certified.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver woodwork until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet specified requirements.

1.06 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is completed, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period. Comply with the requirements in NAAWS 4.0 Section 13 for range and maintenance of relative humidity.
- B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of work.

1.07 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work to ensure that interior architectural woodwork can be supported and installed as indicated.

- B. Fabricated woodwork shall be left in a well-ventilated warehouse for a minimum of 72-hours prior to delivery to the Project site.

1.08 INDOOR AIR QUALITY

- A. Do not use wood products containing urea formaldehyde glues inside the shell of the building.
- B. When machining plastic products, protect surrounding areas from dust.

1.09 WARRANTY

- A. Warrant interior architectural woodwork to be of good material and workmanship and free from defects that render it unserviceable for the for which it is intended for a period of 5-years from date of Substantial Completion. Natural variations in the color or texture of the wood are not considered defects. This warranty is in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Provide materials that comply with requirements of the NAAWS 4.0 for each type of woodwork and NAAWS quality grade specified.
- B. Lumber Standards: Comply with PS 20 for lumber and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee Board of Review and NAAWS 04 Section 03 for specified grade.
- C. Sheet Products: Comply with NAAWS 04 Section 04 and the following depending on the type of sheet product used. Balance sheet shall be same wood veneer as face. Core material shall be one of the following at Contractor's option unless specific core requirements are indicated or specified.
 - 1. Plywood Standards: Comply with PS 1 or APA PRP-108. Plywood products shall contain no added urea-formaldehyde as a binder.
 - 2. Particleboard: Particleboard complying with ANSI A208.1, Grade M-2, made with binder containing no urea-formaldehyde resin.
 - 3. Medium Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
- D. Particleboard: ANSI A208.1, Grade M2 or better, moisture resistant.
- E. Medium Density Fiberboard (MDF): ANSI A208.2, Grade 130 or better, moisture resistant.
- F. Furring, Blocking, Shims and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15-percent moisture content.
- G. Screws: Material, type, size, and finish required for each use.
- H. Nails: Material, type, size, and finish required for each use.
- I. Anchors: Material, type, size, and finish required for each substrate for secure anchorage.
- J. Glue: VOC compliant type as recommended by manufacturer for general carpentry use.
- K. Adhesives: VOC compliant type as recommended by manufacturer, containing no urea formaldehydes.

2.02 FABRICATION, GENERAL

- A. Comply with NAAWS 4.0 requirements for the grade specified.
- B. Wood Moisture Content: Comply with requirements of referenced quality standards for moisture content of lumber in relation to relative humidity conditions existing at time of fabrication and in installation areas.
- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to a radius as follows:
 - 1. Corners and edges of solid wood members less than 1-inch in nominal thickness: 1/16-inch.
 - 2. Edges of rails and similar members more than 1-inch in nominal thickness: 1/8-inch.
- D. Complete fabrication, including assembly and finishing before shipment to Project site to maximum extent possible. Disassemble components only as required for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- E. Shop-cut openings to maximum extent possible. Locate openings accurately and use templates for roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges and cutouts.

2.03 MILLWORK FOR TRANSPARENT FINISH

- A. Standard: NAAWS 04 Section 06.
- B. NAAWS 04 Grade: Premium.
- C. Backout or groove backs of flat trim members and kerf backs of other wide flat members. Back miter any exposed ends to conceal relieved or grooved backs.
- D. Assemble casings in plant except where limitations of access to place of installation require field assembly.
- E. Lumber Species and Cut: As indicated in the Finish Schedule on the Drawings or as selected by the Architect.
- F. Finish: Prefinished as specified.

2.04 MILLWORK FOR OPAQUE FINISH

- A. Standard: NAAWS 04 Section 06.
- B. NAAWS 04 Grade: Custom.
- C. Backout or groove backs of flat trim members and kerf backs of other wide flat members. Back miter exposed ends to conceal relieved or grooved backs.
- D. Assemble casings in plant except where limitations of access to place of installation require field assembly.
- E. Lumber Species: MDF or closed grain hardwood veneer species of manufacturer's choice.
- F. Finish: Shop prime for field-applied paint finish as specified in Section 09 91 00.

2.05 FRAMES AND JAMBS FOR OPAQUE FINISH

- A. Standard: NAAWS 04 Section 06.

- B. NAAWS 4.0 Grade: Premium.
- C. Lumber Species: Any closed-grain hardwood listed in referenced woodworking standard.
- D. Construct frames with rabbetted jambs.
- E. Finish: Prefinished as specified or shop primed for field-applied paint finish as specified in Section 09 91 00, at Contractor's option.

2.06 SHOP-FINISHING OF INTERIOR ARCHITECTURAL WOODWORK

- A. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces and similar preparation of architectural woodwork.
- B. Standard: NAAWS 04 Section 05.
- C. Transparent Finish for Closed-Grain Woods:
 - 1. NAAWS 4.0 Grade: Premium.
 - 2. NAAWS 4.0 Finish System 12: Polyurethane, Water-Based.
 - 3. Wash Coat: Reduced vinyl sealer at stained finish.
 - 4. Stain: Match approved sample for color.
 - 5. Sealer: Vinyl.
 - 6. Finish: Two topcoats in sheen to match approved sample.
- D. Transparent Finish for Open-Grain Woods:
 - 1. NAAWS 4.0 Grade: Premium.
 - 2. NAAWS 4.0 Finish System 12: Polyurethane, Water-Based.
 - 3. Wash Coat: Reduced vinyl sealer.
 - 4. Stain: Match approved sample for color.
 - 5. Filler.
 - 6. Finish: Two topcoats in sheen to match approved sample.
- E. Opaque Finish:
 - 1. NAAWS 4.0 Grade: Premium.
 - 2. NAAWS 4.0 Finish System 12: Polyurethane, Water Based.
 - 3. Primer: As recommended by finisher.
 - 4. Finish: Two topcoats in color and sheen to match approved sample.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.02 INSTALLATION

- A. General: Install interior architectural woodwork in accordance with NAAWS 4.0 Section 14 for same grade specified for woodwork involved.
- B. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8-inch in 8'-0" for plumb and level. Comply with additional requirements of NAAWS 4.0 Section 15.
- C. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.
- E. Millwork: Install with minimum number of joints possible, using full-length pieces to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns and miter at corners.

3.03 ADJUSTMENT AND CLEANING

- A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean woodwork on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.04 PROTECTION

- A. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer, to ensure woodwork is without damage or deterioration at time of final acceptance.

END OF SECTION

SECTION 06 41 00

ARCHITECTURAL WOOD CASEWORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing architectural wood casework, including but not limited to the following:
 - 1. Custom wood veneer cabinetwork.
 - 2. Plastic laminate countertops.
 - 3. Metal support brackets for wall-mounted countertops.
- B. Related Sections:
 - 1. Interior architectural woodwork is specified in Section 06 40 23.
 - 2. Field-applied finishes are specified in Section 09 91 00.
 - 3. Stone countertops are specified in Section 12 36 40.

1.02 SUBMITTALS

- A. Samples:
 - 1. Samples shall comply with NAAWS 04, Section 01.7.
 - 2. Specified plastic laminate colors for verification of initial selections.
 - 3. Minimum three 12-inch x 12-inch square samples of specified wood veneers showing full range of grain and color characteristics to be expected in the finished work.
 - 4. Minimum three 12-inch-long wood samples showing full range of grain and color characteristics to be expected in the finished work.
 - 5. Exposed hardware items if requested by the Architect.
- B. Shop Drawings: Show details of fabrication and installation, dimensioned plans, elevations, and sections. Each set of shop drawings shall comply with North American Architectural Woodwork Standards 4.0 (NAAWS 4.0) Section 01 – Submittals.
 - 1. Shop drawings shall bear the Woodwork Institute Certified Compliance Program Label on the first page. Photocopies of architectural drawings are not acceptable. Highlight any modifications to the Specifications or NAAWS 04 requirements.

- C. Warranty.

1.03 QUALITY ASSURANCE

- A. Materials and fabrication of cabinetwork shall be in accordance with the standards of NAAWS 4.0 for the grades specified.
- B. Fabricator shall be a Woodwork Institute Accredited Millwork Company in good standing.

1. Fabricator shall have not less than 5-years of production experience like that required for this Project, whose qualifications indicate the ability to comply with the requirements of this Section.
 2. The fabricator shall have a least one project in the past 5-years where the value of the work was within 20-percent of the cost of casework for this Project.
- C. Single Source Responsibility: A single fabricator shall provide and install the work of this Section.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Protect casework during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver casework until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate casework have been completed in installation areas. If casework must be store in other than installation areas, store only in areas whose environmental conditions meet specified requirements.

1.05 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is completed, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period. Comply with the requirements of NAAWS 4.0 Section 13 for range and maintenance of relative humidity.
- B. Field Measurements: Check actual dimensions of other construction by accurate field measurements before fabrication and show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
1. Verify locations of concealed framing, blocking, backing, reinforcements, and other items that support cabinetwork by accurate field measurements before being enclosed and record on shop drawings.
- C. Verify that wall, ceiling and floor surfaces to receive casework are within acceptable tolerances.
- D. Pre-installation Meeting: Before framing is completed, hold a meeting with the Contractor, the casework manufacturer, casework installer, and the framing contractor.
1. Review the locations of backing required for casework installation as indicated on the casework shop drawings.
 2. Review the method of attachment of the backing to the wall system as indicated.

1.06 COORDINATION

- A. Cabinets shall be left in a well-ventilated warehouse for a minimum of 72-hours prior to delivery to the Project site.
- B. Cabinets shall be acclimated to the field conditions for a minimum of 72-hours prior to installation.

1.07 INDOOR AIR QUALITY

- A. Do not use wood products containing urea formaldehyde glues inside the shell of the building.
- B. When machining plastic products, protect surrounding areas from dust.

1.08 WARRANTY

- A. Warrant architectural wood casework to be of good material and workmanship and free from defects that render it unserviceable for the use for which it is intended for a period of 5-years from date of Substantial Completion. This warranty is in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Provide materials that comply with requirements of NAAWS 4.0 for each type and grade of casework specified.
- B. High-Pressure Decorative Laminate (HPDL): Comply with NAAWS 4.0 Section 04.8 and NEMA LD-3.
1. Horizontal Surfaces: Grade HGS, 0.048-inch nominal thickness.
 2. Horizontal Formed Surfaces: Grade HGP, 0.039-inch nominal thickness.
 3. Vertical Surfaces: Grade VGP, 0.028-inch nominal thickness.
 4. Fire-Rated Surfaces: Grade HGF, 0.048-inch nominal thickness
 5. Cabinet Liner: Grade CLS, 0.020-inch nominal thickness.
 6. Backer: Grade BKL, 0.020-inch nominal thickness.
 7. Manufacturer, Pattern, Sheen, Color: As indicated in the Finish Schedule on the Drawings or as selected by the Architect.
- C. Low-Pressure Decorative Laminate (LPDL): Comply with NAAWS 4.0 Section 04 and NEMA LD3. LPDL shall consist of melamine, polyester or foil resin-impregnated paper thermally fused under pressure to an approved core and have a balance sheet.
- D. Balance Sheet:
1. Wood Veneer Casework: Wood veneer of the same or a compatible species and thickness.
 2. Plastic Laminate Faced Casework: Grade HPL of the same thickness.
 3. Plastic Laminate Countertops: Grade BKL, 0.020-inch thick.
- E. Hardwood Veneer for Transparent Finish:
1. Veneer: NAAWS 4.0 AA Grade, species and cut as indicated in the Finish Schedule on the Drawings or as selected by the Architect.
 2. Core: As specified.
- F. Hardwood Veneer for Opaque Finish:
1. Veneer: NAAWS 4.0 Grade B, close grain hardwood veneer.
 2. Core: As specified.

- G. Hardwood Trim for Transparent Finish: NAAWS 4.0 Premium Grade, species and cut to match hardwood veneer.
- H. Hardwood Trim for Opaque Finish: NAAWS 4.0 Custom Grade, close grain hardwood.
- I. Particleboard:
 - 1. ANSI A208.1, Grade M2 or better, moisture resistant.
 - 2. At sink cabinets, ANSI A208.1, water-resistant Grade M3 MR-50.
 - 3. Particleboard shall contain no added urea formaldehyde resins and CARB compliant.
- J. Medium Density Fiberboard (MDF):
 - 1. ANSI A208.2, Grade 130 or better, moisture resistant.
 - 2. At sink cabinets, ANSI A208.2, water-resistant Grade 155 MR-50.
 - 3. Medium density fiberboard shall contain no added urea formaldehyde resins and CARB compliant.
- K. Plywood: NAAWS 4.0 Grade B closed grain hardwood veneer core plywood, smooth, well-sanded, thickness indicated.
 - 1. Provide exterior grade with waterproof glue at countertops with sinks.
 - 2. Plywood shall contain no added urea formaldehyde resins and CARB compliant.
- L. Hardboard: Manufactured of interfelted lignocellulosic fibers, consolidated under heat and pressure to a density of 31-pcf or greater, tempered grade, 1/4-inch-thick tempered, smooth both sides.
- M. Core Material:
 - 1. Plastic Laminate and Hardwood Veneer: Medium density fiberboard, plywood, or particleboard at fabricator's option.
 - 2. Plastic Laminate Countertops without Sinks: Particleboard, MDF or hardwood plywood with a non-telegraphing grain, manufactured with exterior glue.
 - 3. Plastic Laminate Countertops with Sinks: Water-resistant hardwood plywood manufactured with exterior glue.
- N. Lumber:
 - 1. NAAWS 4.0 Section 03, grade specified for the product being fabricated.
 - 2. Moisture Content: 6- to 12-percent for boards up to 2-inch nominal thickness; not to exceed 19-percent for thicker pieces.
- O. Adhesives: VOC compliant contact, Type II, water-resistant except Type I, fully waterproof at sink tops and sink base cabinets.
- P. Hardware: Furnish and install as required to provide a complete casework installation.

1. General: Hardware shall meet the requirements of ANSI/BHMA, minimum Grade 2 requirements with the exception of requiring "dynamic" load testing for a minimum of 50,000 cycles and NAAWS 4.0.
2. Hinges: Concealed European style Grade II, minimum 120-degree opening, capacity meeting ANSI/BHMA 156.9.
3. Pulls: To be selected by the Architect.
4. Drawer Guides: Full extension, roller, or ball bearing, meeting the requirements of NAAWS 4.0 for the type and size of drawer.
 - a. Pencil Drawers: Minimum 50-pound capacity.
 - b. General Purpose Drawers: Minimum 75-pound capacity.
 - c. File Drawers: Minimum 150-pound capacity, except for 200-pound capacity for lateral file drawers over 30-inches in width.
5. Shelf Supports: Bored hole system with minimum 5 mm metal pin or recessed metal shelf standard and compatible supports as indicated or as directed by the Architect.
6. Locks: Provide where indicated, installed to withstand a minimum of 50-lb. pull force in the locked position, complying with ADA Section 4.13.9.
 - a. Non-digital / -electronic locks shall be keyed as directed.
 - b. Digital / electronic locks shall have non-volatile memory, have minimum 4-digit user access pin codes and 5-digit master pin code.
7. Finish:
 - a. Exposed hardware: To be selected by the Architect.
 - b. Semi-exposed Hardware: Manufacturer's standard finish.
8. Grommets: Provide at penetrations through countertops. Material, size, finish, and color as approved by the Architect. Coordinate location with Owner.
9. Base Adjusters: Adjustable screw type having a floor bearing surface of at least 1-1/8-inch in diameter at each foot with cover caps.

2.03 FABRICATION

- A. Fabricate products in accordance with the approved Shop Drawings and specified NAAWS 4.0 Grade requirements. The architectural drawings indicate form and profile concept only. Fabrication and construction details shall comply with NAAWS unless otherwise specified.
- B. Fabricate wood casework for transparent finish in accordance with NAAWS 4.0 Section 10, Premium grade, Construction Type A – Frameless Construction: Interface Style 1 – Flush Overlay. Cabinets shall receive a factory-applied transparent finish as specified, to match Architect's sample.
 1. Semi-exposed surfaces of cabinet tops and bottoms, cabinet ends, fixed and adjustable shelves, cabinet back, shall be finished with a polyester laminate; exposed edges of semi-exposed surfaces shall be finished with a thin applied hardwood band.

2. Door and Drawer Edge: Square edge with 0.02-inch-thick veneer band matching exposed faces.
 3. Shelf Thickness: As specified in NAAWS 4.0 for a uniform load of 50-lb./sq. ft.
 4. Drawer Construction: Dowel or dovetail construction. Sides of ½-inch thick 7 or 9 ply hardwood plywood with no voids. Bottoms of hardwood plywood of the same species and cut as the sides, ¼-inch thick. Drawer boxes wider than 30-inches shall have ½-inch thick bottoms.
- C. Fabricate wood casework for opaque finish in accordance with NAAWS 4.0 Section 10, Custom grade, Construction Type A – Frameless Construction: Interface Style 1 – Flush Overlay. Cabinets shall receive a factory-applied opaque finish as specified.
1. Semi-exposed surfaces of cabinet tops and bottoms, cabinet ends, fixed and adjustable shelves, cabinet back, shall be finished with a polyester laminate; exposed edges of semi-exposed surfaces shall be finished with a thin applied hardwood band.
 2. Door and Drawer Edge: Square edge with 0.02-inch-thick veneer band.
 3. Shelf Thickness: As specified in NAAWS 4.0 for a uniform load of 50-lb./sq. ft.
 4. Drawer Construction: Dowel or dovetail construction. Sides of ½-inch thick 7 or 9 ply hardwood plywood with no voids. Bottoms of hardwood plywood of the same species and cut as the sides, ¼-inch thick. Drawer boxes wider than 30-inches shall have ½-inch thick bottoms.
- D. Fabricate laminated plastic casework in accordance with NAAWS 4.0 Section 10, Construction Type - Frameless: Door Interface Style - Flush Overlay.
1. Grade: Custom except as otherwise specified.
 2. Exposed exterior portions shall be covered with a HPDL as specified.
 3. Exposed interior surfaces, except at doors and drawer fronts shall be covered with a HPDL matching exposed exterior surfaces.
 4. Exposed interior surfaces of door and drawer fronts shall be covered with the same material, pattern, color and thickness as the door face.
 5. Edge Banding: HPDL or PVC, minimum 0.02-inch thick, color-matched to the exposed face.
 6. Semi-exposed surfaces of cabinet tops and bottoms, cabinet ends, fixed and adjustable shelves, cabinet back, shall be finished with a low-pressure melamine overlay or cabinet liner; exposed edges of semi-exposed surfaces shall be finished with extruded PVC or self-edged plastic laminate.
 7. Door and Drawer Edge: Square edge with thin applied band.
 8. Shelf Thickness: As specified in NAAWS 4.0 for a uniform load of 50-lb./sq. ft.
 9. Drawer Construction: Dowel or dovetail construction. Sides of ½-inch thick 7 or 9 ply hardwood plywood with no voids. Bottoms of hardwood plywood of the same species and cut as the sides, ¼-inch thick. Drawer boxes wider than 30-inches shall have ½-inch thick bottoms.
- E. Laminated Plastic Countertops: Fabricate in accordance with NAAWS 4.0 Section 11, Premium grade.

1. Countertop Splash Assembly: NAAWS 4.0 Assembly 2, deck-mount back and end splashes.
 2. Countertop Edges: Self-edged with plastic laminate or hardwood trim as indicated.
 3. Back Splash: Horizontal square butt joints or integral cove as indicated.
 4. Top of Back Splash: Square with self edge.
 5. Back Splash Height: As indicated.
 6. Cutouts: Seal edges of cutouts in sink countertops with a color-toned water-resistant sealer before sinks are installed.
- F. Make cuts required to accommodate the work of other Sections in the shop where possible. Review other drawings and work to determine extent of items to be mounted in cabinetwork. Notify the Architect of discrepancies.
- G. Shop-fabricate cabinets and countertops in whole units or partial units practical for handling and transporting. Assemble partial units in place so that each complete unit becomes a unified whole visually and structurally. Fabricate fillers and scribe strips of same materials and finishes as adjacent units.
- H. Make cuts for hardware and equipment neat and true. Install hardware and fit securely.
- I. Adjust drawers, doors, and movable shelves to operate easily and smoothly without binding.

2.04 SHOP-FINISHING OF ARCHITECTURAL WOOD CASEWORK

- A. Quality Standard: Comply with NAAWS 4.0 Section 05.
- B. Preparation for Finishing: Comply with NAAWS 4.0 Section 05 requirements for sanding, filling countersunk fasteners, sealing concealed surfaces and similar preparation of architectural woodwork.
- C. Transparent Finish for Open-Grain Woods:
1. NAAWS 04 Grade: Premium.
 2. NAAWS 4.0 Finish System 12: Polyurethane, Water-Based.
 3. Wash Coat: Reduced vinyl sealer at stained finish.
 4. Stain: Match approved sample for color.
 5. Filler.
 6. Finish: Two topcoats in sheen to match approved sample.
- D. Transparent Finish for Closed-Grain Woods:
1. NAAWS 4.0 Grade: Premium.
 2. NAAWS 4.0 Finish System 12: Polyurethane, Water-based.
 3. Wash Coat: Reduced vinyl sealer at stained finish.
 4. Stain: Match approved sample for color.

- 5. Sealer: Vinyl.
- 6. Finish: Two topcoats in sheen to match approved sample.
- E. Opaque Finish:
 - 1. NAAWS 4.0 Grade: Premium.
 - 2. Primer: As recommended by finisher.
 - 3. Finish: Two topcoats in color and sheen to match approved sample.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify the adequacy and location of required backing or support framing.
- B. Verify that mechanical, electrical, plumbing and other building components affecting the work of this Section are in place.

3.02 INSTALLATION

- A. Install cabinetwork in accordance with NAAWS 4.0 Section 14, Premium Grade requirements.
- B. Install products plumb and level.
- C. Securely fasten cabinetwork to supporting substrate as indicated.
- D. Anchor tops to base units and other supports as indicated. Seal space between backsplash and wall with sanitary sealant specified in Section 07 92 00. Install with no more than 1/8-inch in 8'-0" sag, bow, or other variation from straight line.
- E. Fit tight and scribe to walls, ceilings, and other surfaces so no open joints occur.
- F. Remove and replace materials damaged beyond repair or stained beyond cleaning.
- G. Installation Tolerances: As specified in NAAWS 4.0 Section 15.

3.03 ADJUSTMENT, CLEANING, AND PROTECTION

- A. Repair damaged and defective cabinetwork where possible to eliminate defects; where not possible to properly repair, replace.
- B. Clean, lubricate and make final adjustments to hardware for proper operation.
- C. Clean cabinetwork on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.
- D. Protect cabinetwork to ensure work will be without damage at time of Substantial Completion. Cover completed cabinetwork with 4-mil polyethylene film protective enclosure, applied in a manner to permit easy removal.

END OF SECTION

SECTION 06 64 00

PLASTIC PANELING (FRP)

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes fiberglass reinforced plastic (FRP) coated wall panels, trim, adhesive, and accessories.
- B. Related Sections:
 - 1. Joint sealants are specified in Section 07 92 00.

1.02 SUBMITTALS

- A. Shop Drawings: Indicate panel layouts and seaming diagrams. Provide details at joints, transitions of panels and materials.
- B. Product Data: Furnish literature for FRP system and installation instructions.
- C. Samples: Furnish finish and color samples from manufacturer's full range of colors. Furnish two 12-inch-long samples of each type of trim.

1.03 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Provide factory wrapping, packaging, and other means necessary to prevent damage or deterioration during shipment, handling, and storage.
- B. Maintain protective coverings in place and in good repair until removal is necessary.
- C. Store products inside enclosed storage facilities or closed building, supported above grade and slabs-on-grade.
- D. Maintain storage spaces and products in dry condition within temperature extremes recommended by manufacturer.
- E. Follow special instructions of manufacturer.

1.04 PROJECT CONDITIONS

- A. Do not begin installation until building is enclosed, permanent heating and cooling equipment is in operation and residual moisture has dissipated.
- B. Maintain ambient temperature and relative humidity within limits required by type of adhesive used and recommendations of adhesive manufacturer.
- C. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

PART 2 - PRODUCTS

2.01 PLASTIC PANELING (FRP)

- A. Approved Manufacturers: Crane Composites "KEMLITE Fire-X Glasbord" or "Sequentia Flat", NUDO "FiberLite", Sequentia "Structoglas", Marlite "Regular" or approved equal.

- B. Texture: As selected by the Architect from manufacturer's standards.
- C. Thickness: Manufacturer's standard for selected texture.
- D. Color: As indicated on the Drawings or as selected by the Architect.
- E. Flame Spread: 25 or less, ASTM E84.
- F. Smoke Developed: 450 or less, ASTM E84.
- G. Panels shall exhibit no more than a 0.038-percent weight loss after a 25-cycle Taber Abrasion Test.

2.02 MISCELLANEOUS MATERIALS

- A. Adhesive: VOC-compliant waterproof adhesive as recommended by panel manufacturer for installation conditions.
- B. Moldings: PVC. Provide inside corners, outside corners, edging, division strips, and base molding.
- C. Sealant: As specified in Section 07 92 00.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install panels in accordance with panel manufacturer's instructions using moldings and adhesive. Install panels with manufacturer's recommended gap for panel field and corner joints.
- B. Before installing panels in moldings, fill grooves in moldings with silicone sanitary sealant specified in Section 07 92 00.

3.02 COMPLETION

- A. When complete, panels shall be securely adhered to substrates and moldings shall be plumb and level.
- B. Exposed surfaces shall be clean and free from scratches, dents, tool marks, stains, discoloration, fingerprints, and other defects and damage.

END OF SECTION

SECTION 07 21 00

THERMAL INSULATION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing thermal insulation.
- B. Related Sections:
 - 1. Firestopping insulation is specified in Section 07 84 00.
 - 2. Acoustic insulation is specified in Section 09 81 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's specifications for each type of insulation required. Include recycled content and IAQ certifications.

1.03 QUALITY ASSURANCE

- A. Thermal Conductivity: Where insulation is indicated or specified by "R" value, provide thickness required to achieve indicated value. Use aged and settled values for thermal resistance factors (R-values), tested in accordance with ASTM C518 at 75-deg. F. and 50-percent relative humidity for at least 6-months.
- B. Fire Ratings: Comply with fire-resistance and flammability ratings specified.
- C. Fiberglass insulation shall be certified by the manufacturer to comply with California standards for insulating materials and shall be Green Guard Children & Schools Certified.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation from physical damage and from becoming wet or soiled. Comply with manufacturer's recommendations for handling, storage, and protection during installation.

1.05 TESTING AND INSPECTIONS

- A. Inspect insulation for proper installation. Correct defects such as voids, gaps or insulation compressed behind pipes before accepting work.

1.06 INDOOR AIR QUALITY

- A. Protect ducts and HVAC system from loose insulation particulates.
- B. Provide temporary ventilation of building areas where building insulation is being installed.

PART 2 - PRODUCTS

2.01 BATT AND BLANKET INSULATION

- A. Unfaced Formaldehyde-Free Thermal Batt/Blanket Insulation:
 - 1. Approved Manufacturers: Johns Manville "Formaldehyde-free Unfaced", Owens Corning "EcoTouch Unfaced Insulation" or approved equal.

2. Material: Thermal fiberglass insulation made from resilient glass fibers bonded with a formaldehyde-free acrylic thermosetting binder, complying with ASTM C665, Type I.
3. Surface Burning Characteristics: Flame spread 25 or less; smoke developed 50 or less, when tested in accordance with ASTM E84.
4. Thickness: As required for indicated R-values. Size batts to fill framing cavity.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Comply with manufacturer's instructions for installation conditions.
2. Do not install insulation until building is sufficiently enclosed or protected against absorption of moisture by the insulation, and do not install insulation unless supporting framing and construction is in a thoroughly dry condition.
3. Install snugly between framing members with ends snugly fitted between units and against adjacent construction.
4. Carefully cut and fit insulation around pipes, conduit, and other obstructions and penetrations.
5. Where door, window and skylight frames occur in framing, cut additional strips of insulation and hand-pack as required to fill voids in and around such frames.
6. Use insulation free of ripped backs and edges.

B. Thermal Batt/Blanket Insulation: Install to completely fill typical and odd spaces in framing where required.

3.02 PROTECTION

A. Protect installed insulation from harmful exposures and from physical damage.

END OF SECTION

SECTION 07 27 19

PLASTIC SHEET AIR BARRIERS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing the following:
 - 1. Plastic sheet air barrier / weather resistant barrier including opening flashings.
- B. Related Sections:
 - 1. Gypsum sheathing is specified in Section 06 16 43.
 - 2. Fiber cement lap siding is specified in Section 07 46 48.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's written instructions, technical data, and tested physical and performance properties.
- B. Shop Drawings: Show relationship of breathable moisture barrier to framing or blocking members, sheathing, exterior cladding and corner conditions, door and window frames, sill pans, through-wall flashing, rain screen battens / cavity design, and pipe, conduit and duct penetrations.
- C. Manufacturer's Instructions: Furnish manufacturer's instructions showing the recommended procedures and sequence of installation.

1.03 QUALITY ASSURANCE

- A. Plastic sheet air barrier shall comply with weather-resistive barrier requirements of CBC Section 1402 with a 60-minute water-resistance rating.
- B. Mock-up: Install mock-up using specified air barrier with system of fastening and taping seams as specified and in accordance with manufacturer's instructions. Obtain Architect's approval for appearance and workmanship before proceeding.

1.04 JOB CONDITIONS

- A. Surfaces to receive plastic sheet air barrier shall be free from projecting nails, wires, or other conditions that might damage barrier.
- B. Surfaces to be covered shall be dry and shall have dried in fair weather not less than 3-days following wetting by rain.
- C. Pre-installation Conference: Conduct conference at Project site. Review requirements for membrane, including surface preparation, substrate condition and pretreatment, temporary weather protection, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to Project site in original containers with seals unbroken, wrapped in a polyethylene sleeve, labeled with manufacturer's name and product brand name.
- B. Store rolls under cover, on a clean, level surface, either flat or upright.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Plastic Sheet Air Barrier: DuPont Weatherization Systems "Tyvek CommercialWrap D" or approved equal, consisting of spunbonded olefin, non-woven, non-perforated, weather barrier.
 - 1. Performance Characteristics:
 - a. Air Penetration: 0.001-cfm/sq. ft. @ 75 Pa when tested in accordance with ASTM E2178. Type 1 when tested in accordance with ASTM E1677. Maximum 0.04-cfm/sq. ft. @ 75 Pa when tested in accordance with ASTM E2367.
 - b. Water Vapor Transmission: 30-perms when tested in accordance with ASTM E96, Method B.
 - c. Water Penetration Resistance: 235 cm when tested in accordance with AATCC Test Method 127.
 - d. Basis Weight: 2.4-oz/sq. yd. when tested in accordance with TAPPI Test Method T-410.
 - e. Air Infiltration Resistance: Air infiltration at >750 seconds when tested in accordance with TAPPI Test Method T-460.
 - f. Tensile Strength: 33/41-lbs/in. when tested in accordance with ASTM D822, Method A.
 - g. Surface Burning Characteristics: Class A when tested in accordance with ASTM E84. Flame Spread 15, Smoke Developed 25.
- B. Sealing Tape/Fasteners:
 - 1. DuPont Tyvek Tape.
 - 2. For Steel Frame Construction: DuPont Tyvek Wrap Cap Screws, 1-5/8-inch rust-resistant screws with 2-inch diameter plastic cap.
 - 3. DuPont StraightFlash.
- C. Sealants: Dowsil "758" or as approved by plastic sheet air barrier manufacturer.
- D. Flashing:
 - 1. DuPont FlexWrap: Flexible membrane flashing materials for window openings and penetrations.
 - 2. DuPont StraightFlash: Straight flashing membrane materials for flashing windows and doors and sealing penetrations such as masonry ties, fastener at metal clips or hot channels used in panel or siding claddings.
 - 3. DuPont StraightFlash VF: Dual-sided flashing membrane materials for brick mold and non-flanged windows and doors.
 - 4. DuPont Thru-Wall Surface Adhered Membrane with Integrated Drip Edge: Thru-Wall flashing membrane materials for flashing at changes in direction or elevation (shelf angles, foundations, etc.) and at transitions between different assembly materials.

5. Preformed Inside and Outside Corners and End Dams as distributed by DuPont: Preformed three-dimensional shapes to complete the flashing system used in conjunction with DuPont™ Thru-Wall Flashing.

PART 3 - EXECUTION

3.01 AIR BARRIER INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install air barrier after sheathing is installed and before windows and doors are installed. Install lower level barrier prior to upper layers to ensure proper shingling of layers.
- C. Overlap air barrier at corners by a minimum of 12-inches.
- D. Overlap air barrier vertical seams by a minimum of 6-inches.
- E. Ensure air barrier is plum and level with foundation and unroll extending air barrier over window and door openings.
- F. Attach air barrier to sheathing with plastic cap fasteners every 12- to 18-inches on vertical stud line.
- G. Tape horizontal and vertical seams of air barrier with specified tape.
- H. Seal tears and cuts in air barrier with specified tape.
- I. Cover installed air barrier with one layer of drainage layer and one layer of sheathing paper slip sheet.

3.02 OPENING PREPARATION FOR NON-FLANGED WINDOWS

- A. Flush cut weather barrier at edge of sheathing around full perimeter of opening.
- B. Cut a head flap at 45-degree angle in the weather barrier at window head to expose 8 inches of sheathing. Temporarily secure weather barrier flap away from sheathing with tape.
- C. Cut 9-inch-wide DuPont FlexWrap or DuPont FlexWrap NF a minimum of 12-inches longer than width of sill rough opening.
- D. Cover horizontal sill by aligning DuPont FlexWrap or DuPont FlexWrap NF edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6-inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
- E. Fan DuPont FlexWrap at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges. Mechanically fastening DuPont FlexWrap NF is not required.
- F. Apply 9-inch-wide strips of DuPont StraightFlash at jambs. Align flashing with interior edge of jamb framing. Start StraightFlash™ at head of opening and lap sill flashing down to the sill.
- G. Spray-apply primer to top 6-inches of jambs and exposed sheathing.
- H. Install DuPont FlexWrap or DuPont FlexWrap NF at opening head using same installation procedures used at sill. Overlap jamb flashing a minimum of 2-inches.
- I. Coordinate flashing with window installation.

- J. On exterior, install backer-rod in joint between window frame and flashed rough framing. Apply sealant at jambs and head, leaving sill unsealed. Apply sealants in accordance with sealant manufacturer's instructions and ASTM C1193.
- K. Position weather barrier head flap across head flashing. Adhere using 4-inch wide DuPont StraightFlash over the 45-degree seams.
- L. Tape top of window in accordance with manufacturer recommendations.
- M. On interior, install metal "L" flashing to create a pan end dam at interior face of window. Install "L" on sealant and seal ends with approved sealant. Install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C1193.

3.03 THRU-WALL FLASHING INSTALLATION

- A. Apply primer per manufacturer's written instructions.
- B. Install preformed corners and end dams bedded in sealant in appropriate locations along wall.
- C. Starting at a corner, remove release sheet and apply membrane to primed surfaces in lengths of 8 to 10 feet.
- D. Extend membrane through wall and leave 1/4-inch minimum exposed to form drip edge.
- E. Roll flashing into place. Ensure continuous and direct contact with substrate.
- F. Lap ends and overlap preformed corners 4-inches minimum. Seal all laps with sealant.
- G. Trim exterior edge of membrane 1-inch and secure metal drip edge per manufacturer's written instructions.
- H. Terminate membrane on vertical wall. Terminate into reglet, counterflashing or with termination bar.
- I. Apply sealant bead at each termination.

3.04 THRU-WALL FLASHING / WEATHER BARRIER INTERFACE AT BASE OF WALL

- A. Overlap thru-wall flashing with weather barrier by 6-inches.
- B. Mechanically fasten bottom of weather barrier through top of thru-wall flashing.
- C. Seal vertical and horizontal seams with tape or sealing membrane.

3.05 THRU-WALL FLASHING / WEATHER BARRIER INTERFACE AT WINDOW HEAD

- A. Cut flap in weather barrier at window head.
- B. Prime exposed sheathing.
- C. Install lintel as required. Verify end dams extend 4-inches minimum beyond opening.
- D. Install end dams bedded in sealant.
- E. Adhere 2 inches minimum thru wall flashing to wall sheathing. Overlap lintel with thru-wall flashing and extend ¼-inch minimum beyond outside edge of lintel to form drip edge.

- F. Apply sealant along thru-wall flashing edges.
- G. Fold weather barrier flap back into place and tape bottom edge to thru wall flashing.
- H. Tape diagonal cuts of weather barrier.
- I. Secure weather barrier flap with fasteners.

END OF SECTION

SECTION 07 46 48

FIBER CEMENT LAP SIDING

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing the following:

1. Fiber cement lap siding and trim as indicated and specified.

B. Related Sections:

1. Rough carpentry is specified in Section 06 10 00.
2. Gypsum sheathing is specified in Section 06 16 93.
3. Plastic sheet air barriers are specified in Section 07 27 19.
4. Sheet metal flashing and trim is specified in Section 07 62 00.
5. Painting is specified in Section 09 91 00.

1.02 SUBMITTALS

- A. Samples: Three 6-inch-long pieces of fiber cement lap siding in specified size and texture.
- B. Product Data: Manufacturer's specifications, installation details and instructions.
- C. Shop Drawings: Show fabrication and installation layouts of fiber cement siding; details of edge conditions, joints, panel thickness, corners, attachment system, and accessories; and special details. Distinguish among shop-, and field-assembled work.
- D. Warranty.

1.03 QUALITY ASSURANCE

- A. Installer: Not less than 3-years' experience with products like those specified in this Section.
- B. Mock-up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship. Include typical inside and outside corner. Finish areas designated by the Architect. Refinish mock-up area as required to produce acceptable work.

1.04 PRODUCT HANDLING

- A. Stack fiber cement siding flat on a smooth, level surface. Protect edges and corners from chipping. Store under cover and keep dry prior to installing.

1.05 PROJECT CONDITIONS

- A. Framing shall have a minimum 1-1/2-inch face and be straight, true, of uniform dimensions and properly aligned.
- B. Install fiber cement siding to dry surfaces.
- C. Repair punctures or tears in the sheathing paper prior to the installation of the fiber cement siding.

1.06 WARRANTY

- A. Warrant fiber cement siding to be free from defects in materials for a period of 30-years from date of Substantial Completion.
- B. Warrant fiber cement trim to be free from defects in materials for 10-years from date of Substantial Completion.
- C. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. James Hardie Building Products "Hardie Plank Lap Siding" or approved equal.

2.02 MATERIALS

- A. Fiber Cement Horizontal Lap Siding: Non-asbestos fiber-cement siding to comply with ASTM C1186 Grade II, Type A. Fiber cement siding shall be non-combustible when tested in accordance with ASTM E136.
 - 1. Type: Smooth.
 - 2. Thickness: .312-inch.
 - 3. Width / Exposure: As indicated or as selected by the Architect.
 - 4. Finish: Factory-applied sealer/primer. Siding will be field painted as specified in Section 09 91 00.
- B. Trim: Non-asbestos fiber-cement complying with ASTM C1186 Grade II, Type A. Fiber cement trim shall be non-combustible when tested in accordance with ASTM E136.
 - 1. Type: Smooth.
 - 2. Width: As indicated.
 - 3. Thickness: .75-inch unless otherwise indicated.
 - 4. Length: 12-feet.

5. Finish: Factory-applied sealer/primer. Trim will be field painted as specified in Section 09 91 00.

2.03 FASTENERS

- A. Self-drilling, corrosion-resistant bugle-head screws as recommended by fiber cement siding manufacturer.

2.04 ACCESSORIES

- A. Sealant: Paintable, 100-percent acrylic latex caulk complying with ASTM C920.
- B. Sheet Metal Flashing: Minimum 26-gauge hot-dipped galvanized steel sheet as specified in Section 07 62 00.
- C. Wood Furring Strips: Nominal 1 x 4 preservative-treated wood furring strips complying with siding manufacturer's requirements.
- D. Insect Barrier: Cosella-Dorken "Delta-Bug Screen" or approved equal.

PART 3 – EXECUTION

3.01 INSTALLATION OF FIBER CEMENT LAP SIDING

- A. Install as indicated and in accordance with manufacturer's instructions. Install siding over wood furring strips as indicated.
- B. Install insect barrier at base of wall or provide siding manufacturer's vented track to prevent insect infiltration.
- C. Prime all field cuts in fiber cement siding prior to installation.
- D. Place fasteners no closer than 3/4-inch from panel edges and 2-inches from panel corners.
- E. Use manufacturer-approved fasteners.
- F. Allow a minimum vertical clearance between the bottom edge of siding and any other material in accordance with manufacturer's instructions.
- G. Maintain clearance between siding and adjacent finished grade.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing flashing and sheet metal.
- B. Related Sections:
 - 1. Self-adhering sheet flashing is specified in Section 07 65 26.
 - 2. Painting is specified in Section 09 91 00.

1.02 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects. Completed sheet metal flashing and trim shall not rattle, leak, or loosen and shall remain watertight.
- B. Fabricate and install roof edge flashing and copings capable of resisting forces required by the California Building Code (CBC) according to recommendations in FMG Loss Prevention Data Sheet 1-49.
- C. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes of 120-deg. F. ambient and 180-deg. F. material surfaces.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's product data, installation instructions and general recommendations for each specified sheet material and fabricated product. Include construction details, material descriptions, dimension of components and profiles, and finishes for each manufactured product or accessory.
- B. Samples: 8-inch square samples of specified sheet materials to be exposed as finished surfaces.
- C. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, and details. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Identification of material, thickness, weight, and finish for each item and location.
 - 2. Details of 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 edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashing, as applicable.
 - 6. Details of special conditions.

7. Details of connections to adjoining work.

1.04 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim like 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 "Architectural Sheet Metal Manual" unless more stringent requirements are indicated or specified.
- C. Pre-installation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer, installer, and installer whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, 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 and trim.
 - 5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.05 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.

PART 2 - PRODUCTS

2.01 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Sheet Metal Thickness: The following table may be used to convert specified sheet metal thickness to gauges. Not all materials will be used in the Project.

Gauge No.	Aluminum	Stainless steel	Zinc-Tin Coated Stainless Steel	Galvanized	Aluminum-Zinc Coated Steel	Zinc
12	---	---	---	---	---	.028"
13	---	---	---	---	---	.032"
14	---	---	---	---	---	.036"
15	---	---	---	---	---	.040"
16	.063"	.063"	---	.064"	.064"	.045"
18	.050"	.050"	---	.052"	.052"	.055"
20	.040"	.038"	---	.040"	.040"	.070"
22	.034"	.031"	---	.034"	.034"	.090"
23	.032"	.028"	---	.031"	.031"	.100"
24	.028"	.025"	---	.028"	.028"	.125"
25	.024"	.022"	.024"	.025"	.025"	---
26	.022"	.019"	.018"	.022"	.022"	---
28	---	.016"	.015"	.019"	.019"	---

- C. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A755.
 - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653, G90 coating designation; structural quality.
 - 2. Surface: Smooth, flat and mill phosphatized for field painting as specified in Section 09 91 00.
- D. Stainless Steel Sheet: ASTM A240 or ASTM A666, Type 304, dead soft, fully annealed, 2D finish, smooth flat surface. Provide where flashings are in contact with the ground and where indicated.

2.02 UNDERLAYMENT MATERIALS

- A. Self-Adhering Sheet Flashing: As specified in Section 07 65 26.

2.03 MISCELLANEOUS

- 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.
- 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.
 - 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.
 - 2. Fasteners for Zinc-Coated (Galvanized) and Aluminum-Zinc Alloy-Coated Steel Sheet: Hot-dip galvanized steel according to ASTM A153 or ASTM F2329 or Series 300 stainless steel.
 - 3. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
- C. Solder:
 - 1. For Zinc-Coated (Galvanized) Steel: ASTM B32, Grade Sn50, 50-percent tin and 50-percent lead or Grade Sn60, 60-percent tin and 40-percent lead.
 - 2. For Stainless Steel: ASTM B32, Grade Sn60, with an acid flux of type recommended by stainless steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100-percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, non-toxic, non-staining tape 1/2-inch wide and 1/8-inch thick.
- E. Elastomeric Sealant: ASTM C920, elastomeric polyurethane, polysulfide, or 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 C1311, 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 D1187.
- I. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.

2.04 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Reglets: Cheney Flashing Company, Fry Reglet Corporation, Hohmann & Barnard, Inc., Keystone Flashing Company, Inc. or approved equal. Form to provide secure interlocking of separate reglet and counterflashing pieces, compatible with flashing material. Provide factory-mitered and -welded corners and junctions and interlocking counterflashing on exterior face of same metal as reglet.
 - 1. Material: 0.022-inch galvanized steel.
 - 2. 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.
 - 3. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
 - 4. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
 - 5. Provide counterflashing wind-resistant clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

2.05 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. Fabricate items at the shop to the greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight required 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, 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.
 - 5. Weld corner transitions watertight.
- 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 and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.
- D. 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.

- E. Fabricate cleats and attachment devices from same material as accessory being anchored or form compatible, non-corrosive metal. Fabricate of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- F. Seams: Fabricate non-moving seams with flat-lock seams. Form seams and seal with elastomeric sealant. Rivet joints where required for strength.

2.06 LOW SLOPE ROOF SHEET METAL FABRICATIONS

- A. Copings: Fabricate in minimum 96-inch long, but not exceeding 10-foot-long sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, seal, and solder or weld watertight.
 - 1. Profile: As indicated.
 - 2. Joint Style: Butt with 12-inch-wide concealed backup plate and 6-inch-wide exposed cover plates.
 - 3. Fabricate from the following material:

Material	Thickness
Galvanized Steel	0.040"

- B. Counterflashing: Fabricate from the following material:

Material	Thickness
Galvanized Steel	0.022"

2.07 WALL SHEET METAL FABRICATIONS

- A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4-inches beyond wall openings. Form head and sill flashing with 2-inch-high end dams. Fabricate from the following material:

Material	Thickness
Galvanized Steel	0.022"

2.08 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from the following material:

Material	Thickness
Galvanized Steel	0.028"

PART 3 - EXECUTION

3.01 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.

3.02 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Flashing Underlayment: Install as specified in Section 07 65 26.

3.03 INSTALLATION

- A. General: Anchor sheet metal flashing and trim and other components 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.
 - 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 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 and required for a watertight installation.
 - 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.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10-feet with no joints allowed within 24-inches 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 deep, filled with sealant concealed within joints.
- D. Seal joints as required for watertight construction.
 - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1-inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40- and 70-deg. F., set joint members for 50-percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant type joints at temperatures below 40-deg. F.

2. Prepare joints and apply sealants to comply with requirements specified in Section 07 92 00.
- E. 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, 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. Remove flux and spatter from exposed surfaces.

3.04 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for required wind pressures.
 1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate.
 2. Anchor interior leg of coping with screw fasteners and washers at 24-inch centers.
- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4-inches over base flashing. Install stainless steel draw band and tighten.
- D. 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 over base flashing. Lap counterflashing joints a minimum of 4-inches and bed with sealant. Secure in a waterproof manner by means of snap-in installation and sealant or lead wedges and sealant.
- E. Roof Penetration Flashing: Coordinate installation of roof penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric or butyl sealant and clamp flashing to pipes that penetrate roof. Coordinate with the work of Section 07 54 23.

3.05 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations. Coordinate installation of wall flashing with installation of wall opening components including windows, doors, and louvers.

3.06 MISCELLANEOUS FLASHING INSTALLATION

- A. 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.

3.07 INSTALLATION 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.

3.08 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. 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

SECTION 07 65 26

SELF-ADHERING SHEET FLASHING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installation of modified bituminous sheet flashing material under metal flashings and where indicated.
- B. Related Sections:
 - 1. Sheet metal flashing and trim is specified in Section 07 62 00.
 - 2. Joint sealants are specified in Section 07 92 00.

1.02 SUBMITTALS

- A. Product Data: Furnish manufacturer's standard product data sheets and installation recommendations and instructions. Include written instructions for evaluating, preparing, and treating substrates as well as technical data including tested physical and performance properties.
- B. Installer qualifications.

1.03 QUALITY ASSURANCE

- A. Installer: Certified or approved by the self-adhering sheet flashing manufacturer to install the specified products with a minimum of 5-years continuous experience installing the specified materials.

1.04 JOB CONDITIONS

- A. Apply self-adhering sheet flashings in fair weather at temperatures of 40-degrees F. and above.
- B. Provide adequate ventilation of enclosed spaces where primer is used.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Store materials in their original, sealed packages, labeled with manufacturer's name, product brand name and type, date of manufacture, lot number, and directions for storing.
- B. Store materials in clean, dry and protected location and within temperature range required by the manufacturer. Protect stored materials from direct sunlight.
- C. Remove and replace materials that cannot be applied within stated shelf life.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. Self-Adhering Sheet Flashing: Henry Company / Fortifiber ""FortiFlash 40" or "Blueskin PE200HT" for application under metal flashings and other high temperature applications or approved equal.

2.02 MATERIALS

- A. Self-Adhering Sheet Flashing: Self-adhesive waterproof membrane composed of a self-sealing SBS modified asphalt core laminated to a cross-laminated, high-density polyethylene film reinforcement with a siliconized paper release sheet.
 - 1. Thickness: 40-mil.
 - 2. Physical Properties:
 - a. Water Vapor Permeance, ASTM E96: <0.05 perms.
 - b. Water Resistance, ASTM D779: >200 hours.
 - c. Lap Adhesion, ASTM D903: 10-lbf/in.
 - d. Puncture Resistance, ASTM D154: 40-lbf.
- B. Self-Adhering Sheet Flashing for Application under Metal Flashing and High Temperature Applications: Self-adhered underlayment consisting of a high softening point, SBS rubberized asphalt compound integrally laminated to a cross-laminated polyolefin film with slip-resistant coating.
 - 1. Thickness: 40 mil.
 - 2. Air Leakage at 75 Pa, ASTM E2178: <0.004 cfm/sq. ft.
 - 3. Elongation at Break, ASTM D412: Minimum 250-percent.
 - 4. Tensile Strength Membrane, ASTM D412: Minimum 600-psi.
 - 5. Moisture Vapor Permeance, ASTM E96: 0.05 perms.
 - 6. Service Temperature: -40-deg. F. to 260-deg. F.
- C. Primer: As recommended by membrane manufacturer for priming substrates to receive self-adhering sheet flashing.
- D. Joint Sealant: Certified by self-adhering flashing manufacturer as being compatible with flashing.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions under which self-adhering sheet flashing will be applied with installer and manufacturer's representative present for compliance with requirements and for other conditions affecting performance of the self-adhering sheet flashing system. Do not proceed with installation until unsatisfactory conditions have been corrected and reviewed by the Architect.
- B. Installation of self-adhering sheet flashing constitutes acceptance of substrate conditions.

3.02 PREPARATION

- A. Remove dust, dirt, loose fasteners, and other protrusions. Clean, prepare and treat substrates according to manufacturer's written instructions. Provide clean, sound, and dry substrate.
- B. Prime substrates to receive self-adhering sheet flashing if required by manufacturer. Allow primer to dry for one hour or until tack-free. Re-prime surfaces not covered within 36-hours.

3.03 INSTALLATION

- A. Self-Adhering Sheet Flashing:
 - 1. Install self-adhering sheet flashing in accordance with manufacturer's written instructions. Ensure that flashing adheres continuously with the substrate and is free of wrinkles, fishmouths, bubbles, creases, and other irregularities.
 - 2. Comply with temperature restrictions of underlayment manufacturer for installation. Use primer rather than nails for installing at low temperatures.
 - 3. Apply in shingle fashion to shed water, with end laps of not less than 6-inches staggered 24-inches between courses.
 - 4. Overlap side edges not less than 3-1/2-inches.
 - 5. Carefully notch and fold flashing corners and returns.
 - 6. Roll installed flashing with roller.
 - 7. Cover installed membrane as soon as possible with subsequently applied covering material. Do not leave membrane exposed to the weather for longer periods than approved by the manufacturer.

3.04 COMPLETION

- A. Remove and replace self-adhering sheet flashing that does not comply with specified requirements. Holes in the flashing shall be patched with a minimum 6-inch overlap or in accordance with the self-adhering sheet flashing manufacturer's instructions.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing firestopping.
- B. Related Sections:
 - 1. Joint sealants are specified in Section 07 92 00.
 - 2. Plumbing is specified in Division 22.
 - 3. Electrical is specified in Division 26.

1.02 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide firestopping systems capable of closing or filling through-penetrations created by the burning or melting of combustible pipes, cable jacketing, or pipe insulation materials, or by the deflection of sheet metal due to thermal expansion.
- B. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
- C. For firestopping exposed to view, provide products when flame-spread values of less than 25 and smoke-developed values of less than 450, when tested in accordance with ASTM E84.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's descriptive, technical data and illustrations. Include manufacturer's installation instructions.
- B. Certification:
 - 1. Manufacturer's certification that products comply with local regulations controlling use of volatile organic compounds (VOC's) and are nontoxic to building occupants.
 - 2. Manufacturer's certification that firestopping materials comply with ASTM E814 and UL 1479.
- C. UL Design Numbers: Furnish UL Design No. from the "Fire Resistance Directory - Volume II" for each required penetration type and configuration. Indicate which materials will be used in firestopping the penetration. Reference architectural, mechanical, plumbing, and electrical drawings.
- D. Furnish documentation indicating deflection and elongation capacity of all head of wall assemblies are equivalent in capacity to design assemblies.

1.04 QUALITY ASSURANCE

- A. Firestopping materials and systems shall be listed and labeled in accordance with requirements of Underwriters Laboratories, Inc. (UL) Building Materials Directory.
- B. Firestopping materials shall conform to California Building Code (CBC) for fire resistance standards and requirements for penetrations in walls, partitions, and floor/ceiling and floor/roof assemblies.

- C. Firestopping materials shall comply with ASTM E814 and UL 1479.
- D. Form materials to remain in place in the completed work and sealant used for firestopping work shall be UL listed and labeled.
- E. Firestopping materials shall be rated as required when tested in accordance with ASTM E119.
- F. Firestopping materials shall be asbestos free and shall not incorporate nor require the use of hazardous solvents.
- G. Firestopping materials shall not shrink upon drying as evidenced by cracking or pulling back from contact surface.
- H. Installer shall have a minimum of 5-years' experience installing UL listed firestop systems in similar type construction.

1.05 JOB CONDITIONS

- A. Follow manufacturer's instructions for temperature, ventilation, and other conditions for mixing and installing foam seals.
- B. Observe and follow manufacturer's precautions when using materials considered toxic and hazardous.
- C. Maintain current copy of UL "Fire Resistance Directory" on Project site.
- D. Installation of firestopping shall precede finishing of gypsum board.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in the manufacturer's unopened containers and packages with manufacturer's name, labels, product identification, lot numbers, and mixing and installation instructions, as applicable.
- B. Store materials in unopened containers and packages, and under conditions recommended by manufacturer.
- C. Store and handle firestopping materials in accordance with manufacturer's Material Safety Data Sheets.

1.07 PROJECT CONDITIONS

- A. Environmental Conditions: Do not install firestopping when ambient or substrate temperatures are outside limits permitted by firestopping manufacturers or when substrates are wet due to rain, condensation, or other causes.
- B. Ventilation: Ventilate firestopping in accordance with manufacturers' instructions by natural means or forced air circulation.

1.08 SEQUENCING AND SCHEDULING

- A. Perform work of this and other Sections in proper sequence to prevent damage to the firestopping materials and to ensure that their installation will occur prior to enclosing or concealing work.
- B. Do not cover firestopping materials until they have been inspected and accepted by the authority having jurisdiction.

PART 2 - PRODUCTS

2.01 FIRESTOPPING, GENERAL

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the penetrating items.
- B. Accessories: Provide components of each firestopping system required to install fill materials. Use only components specified by firestopping manufacturer and which are approved by UL for the designated fire-resistance-rated system.
- C. Manufacturers or systems not listed in UL "Fire Resistance Directory" but who can furnish certification of UL approval may be used in the work.

2.02 THROUGH-PENETRATION FIRESTOPPING MATERIALS

- A. General: Listed manufacturers of through-penetration firestopping are intended as guidelines only; manufacturer and material type shall be as required by the UL Design No. for each penetration to receive firestopping.
- B. Approved Manufacturers: Hilti Construction Chemicals, Inc., STI Firestop, CWS Industrials / RectorSeal, Tremco, Inc., 3M Fire Protection Products or approved equal.
- C. Provide mortar, sealants and caulk, putty, wrap strips, pillows, bags, and other types required for UL Design No. for each penetration to receive firestopping.

2.03 MINERAL FIBER FIRESTOPPING MATERIALS

- A. Material: Semi-rigid mineral fiber insulation, minimum 4-pcf density; Owens Corning "Thermafiber Safing", Johns Manville "Insul-SHIELD", Tremco "TREMstop FS Blanket" or approved equal.
- B. Support Clips: Manufacturer's standard impaling clips or custom designed to suit installation conditions, fabricated from galvanized sheet steel.

2.04 FIRESTOPPING AT ELECTRICAL BOXES AND UTILITY OUTLETS

- A. Utility penetrations in walls, ceilings, or floors requiring protected openings shall be firestopped and sealed with an approved material securely installed, capable of maintaining its integrity when subjected to test temperatures specified in ASTM E814.
- B. Steel electrical outlet boxes on opposite sides of walls requiring protected openings shall be separated by a horizontal distance of 24-inches.
- C. Steel electrical outlet boxes which occur in combination with outlet boxes of any size such that the aggregate area of unprotected outlet boxes exceeds 100-square inches in any 100-square feet of wall area shall be protected by an approved material or detail to decrease the aggregate area of unprotected utility boxes to less than 100-square inches in any 100-square feet of wall.
- D. Steel electrical outlet boxes which exceed 16-square inches in area shall be protected by 3M "Moldable Putty Pads", STI Firestop "SpecSeal SSP Putty & Putty Pads" or approved equal.
- E. Utility and electrical outlets or boxes shall be securely fastened to the stud or framing of the wall or ceiling assembly. The opening in the gypsum board shall be cut so that the clearance between the box and the gypsum board does not exceed 1/8-inch.
 - 1. Fill the 1/8-inch gap with an approved fire-rated sealant.

2.05 MIXING

- A. For those products requiring mixing prior to application, comply with manufacturer's instructions.

2.06 ESCUTCHEONS

- A. Provide brushed stainless-steel escutcheon plates at pipes and conduit exposed to view. Size to suit penetration.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect openings and voids to be sealed to determine if conditions are satisfactory for the proper installation of firestopping. Do not commence work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer.
 - 1. Remove foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
 - 2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping.
 - 3. Remove laitance and form release agents from concrete.
- B. Priming: Prime substrates where recommended by manufacturer using manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of the work. Remove tape as soon as possible.

3.03 EXTENT OF FIRESTOPPING WORK

- A. General: Provide solid continuous firestopping wherever the penetration or addition of a construction element through or adjacent to a fire-rated floor, wall or partition, or roof creates a discontinuity of such a rated separation. Application limited in size and configuration to tested systems. Do not install insulation types specified in other Sections in lieu of specified firestopping materials.
- B. Penetrations:
 - 1. Penetrations include conduit, cable, wire, pipe, duct, and other elements which pass through one or both outer surfaces of a fire-rated floor, roof, wall, or partition.
 - 2. Verify that annular space around sprinkler pipes through fire-rated walls and floors is provided as required by NFPA 13.
- C. Fire Rated Partitions:
 - 1. Gaps at smoke rated and fire-rated partitions shall be firestopped with a firestop sealant as listed in UL "Fire Resistance Directory" and as specified. Apply minimum 3/8-inch bead at intersection of finish material and adjacent surface, both sides and along entire perimeter.

2. Intersections at fire-rated partitions and steel deck type floor-ceiling or roof-ceiling assemblies shall be firestopped as required.

D. Provide firestopping to fill miscellaneous voids or openings at fire-rated construction as specified.

3.04 INSTALLATION

A. Do not install firestopping until building is sufficiently enclosed or protected against adverse weather conditions and supporting framing and surrounding construction is in a dry condition.

B. Prepare and install firestopping in accordance with manufacturer's instructions.

C. Mineral Fiber:

1. Provide in thickness for compressing into voids for a tight friction fit when installed.
2. Provide in width sufficient to fill the depth of the void space using single width pieces.
3. Install with ends tight against terminal end construction, and with intermediate joints well compressed together and tight.
4. For vertical void spaces, provide support clips near each end, spaced not over 24-inches on center.

D. Foam:

1. Provide form materials to retain foam when placed.
2. Prime contact surfaces as recommended by foam manufacturer.
3. Inject foam into void spaces so foam develops full and complete contact with adjoining surfaces, and the space is free from air pockets.
4. Cure foam 24-hours, remove form materials not required to remain, and inspect.
5. Provide additional foam or sealant to fill insufficient depth and remaining voids.

E. Sealants:

1. Prepare penetrations in vertical and horizontal surfaces as required to receive finish products.
2. Install damming materials as required.
3. Apply caulk or putty in accordance with manufacturer's recommendations.

F. Finish surfaces of exposed to view firestopping to a uniform and level condition.

G. Firestopping shall not extend past edges of cover plates, escutcheons, etc. or where it will be exposed to view in the final assembly.

H. Install escutcheon plates at pipes and conduit exposed to view.

3.05 FIELD QUALITY CONTROL

A. Identify firestop systems after installation. Identify the firestop system that has been installed and include the appropriate UL Design Number.

- B. At fire-rated walls, partitions, smoke barriers and other walls required to have protected openings or penetrations, provide a sign or stenciling on each side of the wall above the accessible ceiling stating that penetrations through fire-rated walls and partitions are not permitted unless such penetrations or openings are protected with firestopping meeting code requirements. Letters shall not be less than 1/2-inch in height. Repeat at intervals not exceeding 10-feet measured horizontally. Signs or stenciling shall comply with CBC Chapter 7 requirements.

3.06 CLEANING

- A. Remove spilled and excess materials without damaging adjacent surfaces.
- B. Leave finished work in neat, clean condition with no evidence of spill-overs or damage to adjacent surfaces.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing joint sealants.
- B. Related Sections:
 - 1. Firestopping sealants are specified in Section 07 84 00.
 - 2. Joint sealants related to flashing and sheet metal work are specified in Section 07 62 00.
 - 3. Acoustical joint sealants are specified in Section 07 92 19.
 - 4. Glazing sealants are specified in Section 08 80 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's technical data for each product required, including instructions for joint preparation and sealant application. Include certification by joint sealant manufacturer that sealants, primers, and cleaners comply with local regulations controlling the use of volatile organic compounds (VOC).
- B. Samples: Manufacturer's bead samples of actual products showing full range of colors available, for each product exposed to view.
- C. Test Reports:
 - 1. Certified test results of elastomeric sealants showing compliance with specified requirements. Include results of aged performances including hardness, stain-resistance, adhesion and cohesion under cyclic movement, low temperature flexibility, modulus of elasticity at 100-percent strain, affects of heat and aging, and affects of accelerated weathering.
 - 2. Pre-construction field test results indicating which products and joint preparation methods demonstrated acceptable adhesion to joint substrates.
- D. Certificates: Manufacturer's certification that joint sealants comply with specified requirements and are suitable for uses indicated.
- E. Warranty.

1.03 QUALITY ASSURANCE

- A. Installer's Qualifications: Completion of at least 3 installations similar in type and size to this Project.
- B. Obtain joint sealant materials from a single manufacturer for each product required unless otherwise approved.
- C. Preconstruction Field Testing: Prior to installation of exterior joint sealants, field-test adhesion to joint substrates.

2. Install joint sealants in 5-foot joint lengths. Allow to cure before testing. Test adhesion by pulling sealant out of joint according to "Method A, Field-Applied Sealant Joint Hand Pull Tab", in Appendix X1 in ASTM C1193. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
3. Perform field tests for each type of elastomeric sealant and joint substrate.
4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
5. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
6. Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrate during testing.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in the unopened, original containers or unopened packages with manufacturer's name, labels, product identification, color, expiration period, curing time and mixing instructions for multi-component materials.
- B. Store materials in the original, unopened containers or packages, and under conditions recommended by manufacturers.

1.05 PROJECT CONDITIONS

- A. Environmental Conditions: Do not install sealants when ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer, or to wet joint substrates.
- B. Joint Width Conditions: Do not install sealants when joint widths are less than permitted by sealant manufacturer.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.06 WARRANTY

- A. Exterior Sealants: Furnish a written warranty against leaks or other defects of materials and workmanship for a period of 10-years. Defects include but are not limited to changes in the structural, physical, or chemical properties of the sealant materials that impair function or require abnormal maintenance, changes in surface finish, color or texture, failure in adhesion, weather resistance or durability, failure to prevent entry of water, or failure to comply with specified requirements.
- B. This warranty shall not cover formation of cracks or defects in substrate materials adjacent to the seal, joint movement exceeding movement rating of sealant, or physical damage caused by others.
- C. Repair or replace defective materials and workmanship during warranty period without expense to Owner, including removal and replacement of other items as required.
- D. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

- A. Provide color of exposed joint sealants as selected by Architect. Custom colors will be used.
- B. Provide joint sealers, joint fillers and other materials that are compatible with one another and with joint substrates, as demonstrated by testing and field experience.

2.02 ELASTOMERIC JOINT SEALANTS

- A. Exterior Paintable Building Sealant: Bostik Findley, Inc. "Pro MS-50", BASF "Master Seal NP 150 Premium Sealant" or approved equal latex hybrid sealant.
- B. Exterior Building Sealant at Storefront Framing, Windows, and Areas where Sealant is Unpainted: Dowsil "795 Silicone" or approved equal
- C. Interior Sanitary Sealant: One-part mildew-resistant silicone; ASTM C920 Type S; Grade NS; Class 25; Uses NT, G, A and O; formulated with fungicide for sealing interior joints with nonporous substrates around ceramic tile, showers, sinks and plumbing fixtures; Dowsil "786 Mildew Resistant", General Electric Co. "Sanitary 1700", Sonneborn Building Product Div. "Sonolastic Omniplus", Tremco Tremsil 200 or approved equal.
- D. Horizontal Joint Sealant: Two-part pourable urethane; ASTM C920, Type M; Grade P; Class 25; Uses T, M, A and O; Pecora Corp. "NR-200 Urexpan", Sonneborn "Sonolastic Paving Joint Sealant", Tremco, Inc. "THC-900/901" or approved equal. Horizontal joint sealant shall have a minimum Shore A hardness of 30.

2.03 LATEX JOINT SEALANTS

- A. Interior Building Sealant: Acrylic-emulsion; one-part, non-sag, mildew-resistant, complying with ASTM C834, formulated to be paintable; Pecora Corp. "AC-20", Sonneborn "Sonolac", Tremco Inc. "Tremco Acrylic Latex 834" or approved equal.

2.04 JOINT FILLERS FOR CONCRETE PAVING

- A. Joint Filler: Preformed cork strips complying with ASTM D1752 for Type II or preformed sponge rubber strips complying with ASTM D1752 for Type I.

2.05 JOINT SEALANT BACKING

- A. General: Provide sealant backings which are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved by sealant manufacturer.
- B. Backer Rod at Exterior Locations: ASTM C1330, Type C, closed cell backer rods.
- C. Plastic Foam Joint-Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam, of size, shape, and density to control sealant depth.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer. Provide self-adhesive tape where applicable.

2.06 MISCELLANEOUS MATERIALS

- A. Primer: As recommended by joint sealant manufacturer for adhesion of sealant to joint substrates.
- B. Cleaners for Nonporous Surfaces: Non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.

- C. Masking Tape: Non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.
 - 1. Remove foreign material from joint substrates which could interfere with adhesion of joint sealant, including dust, paints, oil, grease, waterproofing, water repellents, water, and surface dirt.
 - 2. Clean porous surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or acid washing to produce a clean, sound substrate. Remove loose particles remaining from cleaning operations by vacuuming or blowing out joints.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint sealant manufacturer. Apply primer to comply with joint sealant manufacturer's recommendations. 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. Remove tape immediately after tooling without disturbing joint seal.

3.02 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply. Provide temporary ventilation during installation of interior joint sealants.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
 - 1. Install joint-fillers to provide sealant support for optimum performance cross-sectional shapes and depths.
 - a. Do not leave gaps between ends of joint-fillers.
 - b. Do not stretch, twist, puncture, or tear joint-fillers.
 - c. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.
 - 2. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints where required to prevent third-side adhesion of sealant to back of joint.
- D. Installation of Sealants: Install sealants by proven techniques to contact and full wet joint substrates, completely filling recesses provided for each joint configuration and providing uniform, optimum performance cross-sectional shapes and depths.

- E. Tooling of Non-sag Sealants: Tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.03 PROTECTION AND CLEANING

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage.
- B. Cut out and remove damaged or deteriorated joint sealers and reseal joints with matching new materials.
- C. Clean off excess sealants or smears adjacent to joints as work progresses by methods and with cleaning materials approved by sealant manufacturer.

END OF SECTION

SECTION 07 92 19

ACOUSTICAL JOINT SEALANTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing acoustical joint sealants.
- B. Related Sections:
 - 1. Joint sealants are specified in Section 07 92 00.
 - 2. Acoustic insulation is specified in Section 09 81 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's technical data for each product required, including instructions for joint preparation and sealant application. Include certification by joint sealant manufacturer that sealants, primers, and cleaners comply with local regulations controlling the use of volatile organic compounds (VOC).
- B. Samples: Manufacturer's bead samples of actual products showing full range of colors available, for each product exposed to view.
- C. Certificates: Manufacturer's certification that joint sealants comply with specified requirements and are suitable for uses indicated.

1.03 QUALITY ASSURANCE

- A. Installer's Qualifications: Completion of at least 3 installations similar in type and size to this Project.
- B. Obtain joint sealant materials from a single manufacturer for each product required unless otherwise approved.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in the unopened, original containers or unopened packages with manufacturer's name, labels, product identification, color, expiration period, curing time and mixing instructions for multi-component materials.
- B. Store materials in the original, unopened containers or packages, and under conditions recommended by manufacturers.

1.05 PROJECT CONDITIONS

- A. Environmental Conditions: Do not install sealants when ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer, or to wet joint substrates.
- B. Joint Width Conditions: Do not install sealants when joint widths are less than permitted by sealant manufacturer.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.01 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant: Non-drying, non-hardening, permanently flexible, non-skinning, non-staining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound; Pecora Corporation "BA-98", Tremco Inc. "Tremco Acoustical Curtainwall Sealant", USG "Sheetrock Brand Acoustical Sealant" or approved equal.
- B. Fire-rated Acoustical Sealant: Fire-rated, non-skinning, non-hardening, permanently flexible sealant; Pecora Corporation "AC-20 FTR", CSW Industrials / Rectorseal "Metacaulk 1000 Intumescent Firestop Sealant" or approved equal.

2.02 MISCELLANEOUS MATERIALS

- A. Sheet Caulking for Junction Boxes: Lowry's Electrical Box Sealer, Tremco sheet caulking or approved equal.
- B. Sheet Caulking for Junction at Fire-Rated Assemblies: Nelson Firestop Products "FSP Firestop Putty", Hilti CP 617, STI Firestop "SpecSeal SSP Firestop Putty" or approved equal.
- C. Backing Rod: Closed-cell, neoprene rod or polyethylene foam.
- D. Expanding Foam Sealant: UL Class 1 fire-retardant; AkzoNobel "Polycell Expanding Foam", Dow "Great Stuff Pro – Gaps & Cracks" or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with manufacturer's instructions for installation conditions.
- B. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C919 for use of joint sealants in acoustical applications as applicable to materials, applications and conditions indicated. Install sealants in accordance with manufacturer's instructions.
- C. Use acoustical sealant to form an airtight seal at all penetrations and perimeter of sound-rated partitions, floors and ceilings and as indicated. Comply with Section 09 29 00. Use backer rod where gaps to be sealed exceed 3/8-inch.
- D. Use sheet caulking to seal the back and sides of all junction boxes (4 gang and smaller) recessed in sound-rated partitions.
- E. Apply acoustical sealant as a continuous bead along gypsum board face layer at all head and sill conditions of sound rated partitions and around the perimeter of resilient ceilings.
- F. Apply expanding foam sealant where indicated and where multiple pipes or conduits penetrate sound rated construction.

3.02 PROTECTION

- A. Protect installed insulation from harmful exposures and from physical damage.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing hollow metal doors.
- B. Related Sections:
 - 1. Flush wood doors are specified in Section 08 14 16.
 - 2. Door hardware is specified in Section 08 71 00.
 - 3. Glazing is specified in Section 08 80 00.
 - 4. Painting is specified in Section 09 91 00.

1.02 SUBMITTALS

- A. Product Data: Furnish for each type of door, including details of construction, materials, dimensions, hardware preparation, core, label compliance, profiles, and finishes.
- B. Shop Drawings: Include elevations of door types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items. Reference architectural details, door number and hardware group.
- C. Warranty.

1.03 QUALITY ASSURANCE

- A. Steel doors shall comply with ANSI A250.8 "Recommended Specifications Standard Steel Doors and Frames" and the specified requirements.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors cardboard-wrapped or crated to provide protection during transit and job storage.
- B. Inspect doors upon delivery for damage. Minor damage may be repaired provided finish items are equal to new work and acceptable to Architect; otherwise remove and replace damaged items as directed.
- C. Store doors at building site under cover. Place units on minimum 4-inch-high wood blocking. Avoid use of non-vented plastic or canvas shelters that could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inch space between stacked doors to promote air circulation.

1.05 WARRANTY

- A. Warrant hollow metal doors to be free from defects in materials and workmanship for a period of 2-years from date of Substantial Completion. This warranty is in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. Assa Abloy / Ceco Door Products, Assa Abloy / Curries Company, Assa Abloy / Security Metal Products, Republic Doors and Frames, Allegion / Steelcraft or approved equal. Manufacturer shall be an SDI Certified Manufacturer.

2.02 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A569.
- B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A366, commercial quality or ASTM A620, drawing quality.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A526, commercial quality, or ASTM A642, drawing quality, hot dipped galvanized in accordance with ASTM A653, A60 or G90 coating designation, mill phosphatized.
- D. Supports and Anchors: Fabricate of not less than 16-gauge, galvanized where used with galvanized frames.
- E. Inserts, Bolts and Fasteners: Manufacturer's standard units. Where items are built into exterior walls, hot dip galvanize in accordance with ASTM A153, Class C or D as applicable.
- F. Shop Applied Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for finish paint coats specified in Section 09 91 00.

2.03 DOORS

- A. Provide metal doors of ANSI A250.8 grades and models specified.
 - 1. Exterior Flush Doors: Level 3, extra heavy duty, Model 2, minimum 16-gauge galvanized steel faces.
- B. Internal Construction: Manufacturer's standard insulating core.
- C. Clearance: Not more than 1/8-inch at jambs and heads. Not more than 3/8-inch at bottom. Threshold clearances as indicated.
- D. Edges:
 - 0. General: Beveled latch stile for single doors, and meeting stile for pair doors; square elsewhere.
 - 1. Stile Edges: No seams are allowed on vertical stile edges.
 - 2. Top and Bottom Edges: Reinforced with 16-gauge steel channels, top edge flush for interior doors.
- E. Glazing: Provide minimum 20-gauge steel non-removable glazing stops on the outside of exterior doors and on the secure side of interior doors. Glazing beads on the inside of glass panels shall be removable.

2.04 FABRICATION

- A. Fabricate steel doors to be rigid, neat in appearance and free from defects, warp, or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at Project site. Comply with ANSI A250.8 requirements.
- B. Fabricate exposed faces of doors from cold-rolled steel.
- C. Tolerances: Comply with SDI-117, "Manufacturing Tolerances Standard Steel Doors and Frames" unless otherwise indicated or specified.
- D. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat heads for exposed screws and bolts.
- E. Hardware Preparation: Prepare doors to receive hardware in accordance with final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A250.6 for door frame preparation for hardware.
- F. Reinforce doors to receive surface-applied hardware. Drilling and tapping of surface-applied hardware may be done at Project site.
- G. Locate hardware as indicated on final shop drawings and in accordance with Door Hardware Institute (DHI) "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames".
- H. Shop Painting: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces and both faces and all 4 edges of doors.
 - 1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.
 - 2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive paint finish specified in Section 09 91 00.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Install steel doors in accordance with the manufacturer's instructions, the requirements of ANSI/SDI, and final reviewed Shop Drawings.
- B. Door Installation: Fit hollow metal doors accurately in frames, within specified clearances.

3.02 ADJUST AND CLEAN

- A. Immediately after installation, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
 - 1. Remove rust before touch-up is applied.
 - 2. Touch-up shall not be obvious.
- B. When complete, exposed surfaces and edges shall be clean, straight, and free from dents, scratches, and other damage and defects.
- C. Doors and hardware shall operate smoothly, quietly, and free from bind.

END OF SECTION

SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing flush wood doors.
- B. Related Sections:
 - 1. Interior architectural woodwork is specified in Section 06 40 23.
 - 2. Door hardware is specified in Section 08 71 00.
 - 3. Glass for vision panels is specified in Section 08 80 00.
 - 4. Field finishing of doors and accessories is specified in Section 09 91 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's descriptive and technical data and illustrations for each type of door including details of core and edge construction, and trim for openings.
- B. Shop Drawings: Indicate location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for factory finishing and other data.
 - 1. Shop drawings shall comply with North American Architectural Woodwork Standards (NAAWS) 4.0 Section 01 – Submittals.
 - 2. Apply a Woodwork Institute “Certified Compliance Label” on the first page of the shop drawings.
- C. Samples:
 - 1. Submit four finished samples of each species and cut of wood. Lumber samples shall be minimum 6-inches x 12-inches; plywood samples shall be minimum 12-inches x 12-inches. Samples shall represent the range of color and grain expected to be provide. Resubmit samples until approved.
 - 2. Furnish full-size door for transparent finish showing the complete range of color and grain to be expected in the completed work. Resubmit until sample is approved by the Architect. Approved sample will be used to judge the acceptability of transparent finished door veneer and may be used in the Project.
- D. Warranty.

1.03 QUALITY ASSURANCE

- A. Flush wood door construction shall comply with NAAWS 4.0 Section 09 for Premium grade doors.
- B. Fire-Rated Doors: Provide wood doors that comply with California Building Code (CBC) Chapter 7; are identical in materials and construction to units tested in door and frame assemblies in accordance with NFPA 252 or UL 10C; and are labeled and listed by UL, Warnock Hersey, or other testing and inspection agency acceptable to authorities having jurisdiction. Labels shall comply with NFPA 80 and be permanently affixed to the door.

C. Allowable Tolerances:

1. Warp Tolerance: As specified in Section WDMA T-2. In addition, warp tolerance shall apply to pairs of doors and to doors in relation to the frame or jamb in which hung.
2. Squareness: WDMA T-3.
3. Gap Tolerance: As specified in NAAWS 4.0 Section 15.
4. Flushness of Joinery: As specified in NAAWS 4.0 Section 15.

D. Manufacturer: Firm with not less than 5-years of production experience like this Project, whose qualifications indicate the ability to comply with the specified requirements. Manufacturer shall have at least one project in the past 5-years where the value of the wood doors was within 20-percent of the cost of the wood doors for this Project.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors individually protected with polyvinyl or plastic wrap, identified with manufacturer's name, and name and type of door. Identify each door with same symbol used on door schedule. Leave protection on door during construction.
1. Comply with NAAWS 4.0 – Section 02 for delivery, storage, and handling of doors.
- B. Store doors covered and flat, supported above a level surface in a dry, well-ventilated building in compliance with NAAWS 4.0 – Section 02.
- C. Do not subject doors to extremely high or low temperatures or humidity.
- D. Handle with clean gloves; do not drag doors across one another or other surfaces.
- E. Certain wood species are light sensitive. Protect doors from exposure to natural and artificial light after delivery.

1.05 PROJECT CONDITIONS

- A. Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during the remainder of construction period in compliance with the requirements specified in NAAWS 4.0 – Section 02.

1.06 WARRANTY

- A. Warrant each solid core interior door against defects in materials and workmanship for the life of the original installation, including costs of re-hanging. Defects include, but are not limited to the following:
1. Cores shall not telegraph through door faces. Stile, rail, and core show-through shall be considered a defect when the face of the door varies from a true plane exceeding 0.010-inch in a 3-inch span.
 2. Doors shall not have warped (bow, cup, or twist) more than that permitted in NAAWS 4.0 Section 15.
- B. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. Masonite Architectural "Aspiro Series | Marshfield-Algoma", VT Industries, Oregon Door or approved equal.

2.02 FLUSH WOOD DOORS, GENERAL

- A. Type: Flush veneered, five-ply construction. Doors with seven-ply construction will not be acceptable.
- B. Flush Wood Door Minimum ANSI/WDMA I.S. 1A Performance Requirements:
 - 1. Solid Core Doors: Extra Heavy-Duty performance level.
- C. Door Grade:
 - 1. Fabricate flush wood doors to receive opaque finish in accordance with NAAWS 4.0 – Section 09, Custom Grade.
- D. Cross Banding: Manufacturer's standard wood veneer or composite, minimum 1/16-inch thick. Fire-retardant treated where required by testing agency. Particleboard cross bands are not permitted.
- E. Door Thickness: 1-3/4-inches, unless otherwise indicated.
- F. Fabricate wood doors in sizes indicated for either job-site fitting or factory fit doors to suit frame-opening sizes indicated, at the Contractor's option. Doors shall comply with the following uniform clearances and bevels:
 - 1. Non-rated Doors:
 - a. Jambs and Heads: 1/8-inch.
 - b. Meeting Stiles of Pairs of Doors: 1/8-inch.
 - c. Bottom of Door to Top of Finish Floor: 1/2-inch at concrete and resilient flooring, 3/8-inch at carpet, tile, threshold, and other finish flooring.
 - 2. Fire-rated Doors: Comply with requirements of CBC Chapter 7 and NFPA 80.
- G. For doors that are pre-machined, factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame shop drawings, DHI A115-W series standards, and hardware templates.
 - 1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory machining.
- H. Factory Finishing:
 - 1. Doors to be Field Painted: Prime paint doors suitable for field painting as specified in Section 09 91 00. Seal cut-outs, edges, and other surfaces not otherwise finished.

2.03 INTERIOR FLUSH WOOD DOORS

- A. Veneer:

1. Painted Doors:
 - a. Veneer Species and Grade: NAAWS 4.0 Section 04, Grade A, Birch, or other close grain hardwood of manufacturer's choice.
- B. Adhesive: NWDA IS-1.6, Type II adhesive bond or better for cores, Type I adhesive bond for faces and cross bands.
- C. Cores:
 1. 20-Minute Fire-Rated Doors and Non-rated Doors (PC-5): Solid particleboard conforming to ANSI A208.1, Grade LD-2, made with binder containing no urea-formaldehyde resin.
 2. Fire-Rated Doors Greater than 20-Minute Rated (FD-5): Incombustible mineral approved by labeling authority. Provide top, bottom, and intermediate blocking for surface-mounted hardware.
 3. For full glass panel doors where the distance between the lock cutout and the vision lite cutout requires, provide door manufacturer's structural composite lumber core (SCLC-5). Notify the Architect if the vision lite size and lock location exceeds door manufacturer's maximum dimension.
- D. Edge Construction:
 1. 20-Minute Fire-Rated Doors and Non-rated Doors:
 - a. Stiles and Rails: Minimum 1-3/8-inch wide by full core thickness glued to core. Provide wider hinge stile where recommended by door manufacturer for door size and type of hinges to be used. Exposed edges of stiles shall be smooth, straight cut, free from knots, pitch pockets, and other defects for a minimum distance of 1/4-inch from the outside edge along the entire stile.
 - b. Species:
 - 1) Stiles: Close-grain hardwood for doors to receive paint finish.
 - 2) Rails: Hardwood or softwood at manufacturer's option.
 - c. Edge Banding: Minimum 1/2-inch wide by full core thickness. Edge bands if used may reduce the width of stiles and rails.
 - 1) Species for doors to receive paint finish shall be close-grain hardwood.
 2. Fire-Rated Doors Greater than 20-Minute Rated:
 - a. Top Rail: Door manufacturer's standard special laminated material.
 - b. Stiles and Rails: Hardwood, fire-retardant treated where required by label. Where not required to be fire-retardant treated, provide same species for stiles as face veneer for doors to receive transparent finish. Sizes required by testing agency.
 3. Bevel non-rated doors 1/8-inch in 2-inches at lock and hinge edges.
 4. Bevel fire-rated doors 1/8-inch in 2-inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.

2.04 DOOR LOUVERS

- A. Type: Prefabricated 20-gauge steel units.
- B. Opening Sizes: As scheduled.
- C. Finish: Manufacturer's standard baked-enamel finish, of color selected by Architect.

2.05 VISION LIGHT FRAMES

- A. Approved Manufacturer: Anemostat "LoPro" or approved equal.
- B. Material: 20-gauge cold-rolled steel with baked enamel finish in color selected by the Architect.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine door frames and verify that frames are of the correct type and have been installed as required for proper hanging of corresponding doors. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Condition doors to average prevailing humidity in installation area prior to hanging.

3.03 INSTALLATION

- A. Install wood doors in accordance with the manufacturer's printed instructions, as indicated and in accordance with NAAWS 4.0 - Section 14.
- B. Factory-finished doors shall be installed just prior to Substantial Completion.
- C. Fire-Rated Doors: Install in fire-rated frames in accordance with requirements of NFPA Standard No. 80.
- D. Job-Fit Doors: For doors not factory-machined, align and fit doors in frames with uniform clearances and bevels as specified; do not trim stiles and rails exceeding limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
 - 1. Fitting Clearances:
 - a. Non-rated Doors:
 - 1) Jambs and Heads: 1/8-inch.
 - 2) Meeting Stiles of Pairs of Doors: 1/8-inch.
 - 3) Bottom of Door to Top of Finish Floor: 1/2-inch at concrete and resilient flooring, 3/8-inch at carpet, tile, thresholds, and other finish flooring.
 - b. Fire-rated Doors: As specified in CBC Chapter 7 and NFPA 80.
 - 2. Bevel non-rated doors 1/8-inch in 2-inches at lock and hinge edges.
 - 3. Bevel fire-rated doors 1/8-inch in 2-inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.
- E. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

- F. Cutouts, Recesses, and Exposed Rail Edges: Unless factory provided, paint with two coats of clear sealer, each coat well dried, before hardware is set in place.
- G. Meeting stiles of pairs of doors shall be in alignment along the entire height and offset between adjacent leaves shall not exceed 1/8-inch.

3.04 ADJUSTING AND PROTECTION

- A. When complete, doors shall be flat within allowable tolerance, shall be plumb in all positions of swing, and shall operate smoothly, quietly, and free from binding. Re-hang or replace doors that do not swing or operate freely.
- B. Exposed surfaces shall be uniform in appearance, clean and free from scratches, tool marks, dents, discoloration, stains, and other damage and defects.
- C. Refinish or replace doors damaged during installation.
- D. Protect doors as recommended by door manufacturer to ensure that doors will be without damage or deterioration at completion of Project.

END OF SECTION

SECTION 08 31 13

ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing access doors at all required locations.
- B. Related Sections:
 - 1. Rough carpentry is specified in Section 06 10 00.
 - 2. Non-structural metal framing is specified in Section 09 22 16.
 - 3. Gypsum board is specified in Section 09 29 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions, and directions for installation of anchorage devices. Include complete schedule including types, general locations, sizes, wall, and ceiling construction details, finishes, latching or locking provisions and other data pertinent to installation.
- B. Location Drawing: Required access doors may not be indicated on the Drawings. Show proposed location of every required access door with dimensions in plan and elevation. Verify locations with the Architect. Access doors shall be located within walls and ceilings for access including but not limited to the following: automatic valves, automatic dampers, air terminal units, and fire/smoke dampers. Show location of adjacent materials, trim pieces, and hardware required to complete the work. Do not begin installation until location is approved. Submit access door locations superimposed on piping layout and duct layout shop drawings.

1.03 QUALITY ASSURANCE

- A. Fire-Rated Door Assemblies: Units shall comply with NFPA 80, be identical to door and frame assemblies tested for fire-test-response characteristics, and are labeled and listed by UL, Warnock Hersey, or other testing and inspecting agency acceptable to authorities having jurisdiction.

1.04 COORDINATION

- A. Furnish inserts and anchoring devices required to be built into other work. Coordinate delivery to avoid delay.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store access doors in manufacturer's standard protective packaging.
- B. Do not remove protective packaging until ready for installation.
- C. Follow manufacturer's instructions for storage and handling.

PART 2 - PRODUCTS

2.01 MATERIALS AND FABRICATION

- A. Furnish access doors of proper size for access to concealed equipment.
- B. Non-Fire-Rated Access Doors with Exposed Trim at Non-public Areas:
 - 1. Approved Manufacturers: J.L. Industries, Karp Associates, Milcor, Nystrom Building Products or approved equal.
 - 2. Door Design: Flush panel.
 - 3. Material: Commercial grade cold-rolled steel with 16-gauge frame and 14-gauge door.
 - 4. Finish: Phosphate dipped with baked-on rust-inhibitive gray primer.
 - 5. Exposed Trim: 1-inch flange overlapping surfaces surrounding door frame.
 - 6. Hinge: Manufacturer's standard concealed pin hinge mechanism or continuous piano hinge.
 - 7. Latch/Lock: Flush screwdriver operated stainless steel cam latch. Provide standard keyed locks at access doors located in public areas.
- C. Non-Fire-Rated Access Doors with Exposed Trim in Custodial Rooms, and other Wet Areas:
 - 1. Approved Manufacturers: J.L. Industries, Karp Associates, Milcor, Nystrom Building Products or approved equal.
 - 2. Door Design: Flush panel.
 - 3. Material: Stainless steel, 16-gauge frame and 14-gauge door.
 - 4. Finish: Satin polish finish.
 - 5. Exposed Trim: Flange integral with frame, 1-inch wide, overlapping surrounding finished surface.
 - 6. Hinge:
 - a. Areas Exposed to Public View: Concealed pin hinge mechanism. Exposed piano hinges are not acceptable.
 - b. Other Areas: Manufacturer's standard concealed pin hinge mechanism or continuous piano hinge.
 - 7. Latch/Lock: Flush screwdriver operated stainless steel cam latch. Provide standard keyed locks at access doors located in public areas.
 - 8. Provide insulated doors in insulated or acoustically rated construction.
- D. Non-Fire-Rated Recessed Access Doors in Public Areas:
 - 1. Approved Manufacturer: Access Panel Solutions Bauco-Plus II or approved equal
 - 2. Features:
 - a. Concealed aluminum frame and hardware.
 - b. Concealed mechanical touch latch.

- c. Lift-out doors with safety cables.
 - d. Perimeter gasket for air and smoke tight fit.
 - 3. Door Design: Touch-latch recessed panel to receive gypsum wallboard or other finish material as indicated.
 - 4. Frame: Recessed aluminum extrusion. Frame acts as corner bead for finishing with 1/16-inch gape between frame and door.
 - 5. Hinge: Free-pivoting hinge.
 - 6. Latch: Concealed touch latch. Provide keyed lock where doors are within public reach.
 - 7. Finish: Phosphate dipped with baked-on rust inhibiting primer for field painting as specified in Section 09 91 00.
 - 8. Provide insulated doors in insulated or acoustically rated construction.
- E. UL Fire-Rated Access Doors with Exposed Trim in Non-public Areas:
- 1. Approved Manufacturers: J.L. Industries, Karp Associates, Milcor, Nystrom Building Products or approved equal.
 - 2. Door Design: Flush panel.
 - 3. Material: Commercial grade cold-rolled steel with 16-gauge frame and 20-gauge door.
 - 4. Finish: Phosphate dipped with baked-on rust inhibiting primer.
 - 5. Insulation: 2-inch-thick fire-rated insulation sandwiched between two pieces of 20-gauge steel.
 - 6. Exposed Trim: Flange integral with frame, 1-inch wide, overlapping surrounding finished surface.
 - 7. Hinge: Manufacturer's exposed piano hinge.
 - 8. Continuous Closer: Automatic spring closer to automatically close and latch door.
 - 9. Latch/Lock: Ball bearing cylinder lock operated by a recessed flush standard key lock. Panels shall have interior latch release mechanism allowing the door to be unlocked from the inside. Provide standard keyed locks at access doors located in public areas.
- F. UL Fire-Rated Access Doors with Exposed Trim at Custodial Rooms, and Other Wet Areas:
- 1. Approved Manufacturers: J.L. Industries, Karp Associates, Milcor, Nystrom Building Products or approved equal.
 - 2. Door Design: Flush panel.
 - 3. Material: Stainless steel, 16-gauge frame and 20-gauge door.
 - 4. Finish: Satin polish finish.
 - 5. Insulation: 2-inch-thick fire-rated insulation sandwiched between two pieces of 20-gauge steel.

6. Exposed Trim: Flange integral with frame, 3/4-inch wide, overlapping surrounding finished surface.
 7. Hinge: Manufacturer's exposed piano hinge.
 8. Continuous Closer: Automatic spring closer to automatically close and latch door.
 9. Latch/Lock: Ball bearing cylinder lock operated by a recessed flush standard key lock. Panels shall have interior latch release mechanism allowing the door to be unlocked from the inside.
- G. UL Fire-Rated Recessed Access Doors in Public Areas:
1. Approved Manufacturers: J.L. Industries, Karp Associates, Milcor, Nystrom Building Products or approved equal.
 2. Door Design: Recessed to receive gypsum wallboard or other finish material as indicated.
 3. Material: Cold Rolled sheet steel, 16-gauge, recessed 5/8-inch.
 4. Frame: 16-gauge cold rolled sheet steel with 22-gauge galvanized perimeter drywall bead.
 5. Hinge: Manufacturer's exposed piano hinge.
 6. Continuous Closer: Automatic spring closer to automatically close and latch door.
 7. Latch/Lock: Ball bearing cylinder lock operated by a recessed flush standard key lock. Panels shall have interior latch release mechanism allowing the door to be unlocked from the inside. Provide standard keyed locks at access doors located in public areas.
 8. Finish: Phosphate dipped with baked-on rust inhibiting primer for field painting as specified in Section 09 91 00.
- H. Trimless Access Panels in Gypsum Board Ceilings:
1. Approved Manufacturer: Bauco Access Panel Solutions "baucoplus-II series" or approved equal.
 2. Material: Extruded aluminum alloy 6063-T6 frame and supports with moisture- and mold-resistant gypsum board inlay and galvanized internal steel corner reinforcing.
 3. Door: Fabricate using 2.8 mm thick extruded aluminum alloy 6063-T6 frame, screwed in place gypsum board inlay. Exposed top edge of frames shall have a concave meniscus rise of 0.5 mm thick to accept finishing compound.
 4. Frame: Recessed aluminum framing providing an edge like drywall bead.
 5. Hinge: Concealed, galvanized steel free pivot hinge allowing door to open 120-degrees.
 6. Latching/Locking Device: Concealed touch latch.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install access doors in accordance with manufacturer's instructions.
- B. Coordinate installation with work of other Sections.

- C. Set frames accurately in position and securely attach to supports with face panels plumb and level in relation to adjacent finish.
- D. Frames, doors, and trim pieces shall not vary from straightness or snug contact fit by more than 1/16-inch.
- E. Coordinate location of access doors in hung ceilings, furred spaces, and walls to provide access to concealed work items requiring maintenance and/or adjustment. Obtain approval of the Architect for the locations of such access doors.
- F. Locate and group equipment requiring access doors. Coordinate location of equipment with other trades to minimize number of access doors in one area.
- G. Provide access doors for maintenance or adjustment purposes for mechanical system components, including but not limited to the following:
 - 1. Valves.
 - 2. Dampers.
 - 3. Concealed equipment.

3.02 ADJUST AND CLEAN

- A. Adjust hardware and panels after installation for proper operation.
- B. Remove and replace panels and frames that are warped, bowed, dented, or otherwise damaged.

END OF SECTION

SECTION 08 41 13

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing aluminum-framed entrances and storefronts, including exterior entrance doors, transoms, sidelights, and exterior storefront-type framing system.
- B. Primary components of aluminum-framed entrances and storefronts include aluminum storefront framing, glass and glazing, sills and similar items indicated as integral components of the storefront system, joint sealants, flashings, anchors, shims, fasteners, accessories, and support brackets.
- C. Related Sections:
 - 1. Sheet metal flashing and trim is specified in Section 07 62 00.
 - 2. Joint sealants are specified in Section 07 92 00.
 - 3. Aluminum windows are specified in Section 08 51 13.
 - 4. Folding storefront system is specified in Section 08 43 36.
 - 5. Glazing is specified in Section 08 80 00.

1.02 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide aluminum-framed entrances and storefront systems, including compensating channels and sub-sills, complying with performance characteristics specified, as demonstrated by testing the manufacturer's corresponding stock assemblies according to specified test methods. Entrances and storefronts shall accommodate movements and tolerances of the building structure including but not limited to live load and dead load deflection, creep, seismic drift, and adjacent material tolerances.
- B. Thermal Movement: Design the aluminum-framed entrances and storefronts to provide for expansion and contraction of the component materials resulting from a surface temperature range of 180-deg. F. without buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, stress on glass, or other detrimental effects. Entrance doors and operable units shall function normally over the specified temperature range.
- C. Wind Loads: Provide aluminum-framed entrance and storefronts, including anchorage, capable of withstanding wind-load design pressures calculated according to the requirements of California Building Code (CBC) Chapter 16, and as indicated on Structural Drawings.
- D. Structural Performance: Conduct tests for structural performance in accordance with ASTM E330. At the conclusion of the tests there shall be no glass breakage or permanent damage to fasteners, anchors, hardware or actuating mechanism. Framing members shall have no permanent deformation exceeding 0.2-percent of their clear span.
 - 1. Deflection Normal to Plane of the Wall: Test pressure required to measure deflection of framing members normal to the plane of the wall shall be equivalent to the specified wind load. Deflection shall not exceed 1/175 of the clear span, when subjected to uniform load deflection test.

2. Deflection Parallel to the Plane of the Wall: Deflection of any member carrying its full dead load shall not exceed an amount that will reduce glass bite below 75-percent of the design dimension and shall not reduce the edge clearance between the member and the fixed panel, glass or other fixed member above to less than 1/8-inch. The clearance between the member and an operable door or window shall be at least 1/16-inch.
- E. Air Infiltration: Provide aluminum-framed entrances and storefronts with an air infiltration rate of not more than 0.06-cfm per sq. ft. of fixed area, excluding operable door edges, when tested in accordance with ASTM E283 at an inward test pressure differential of 6.2-psf (50-mph wind load).
- F. Water Penetration: Provide storefront framing systems with no uncontrolled water penetration, excluding operable door edges, as defined in the test method when tested in accordance with ASTM E331 and E547 at an inward test pressure differential of 12-psf.
- G. Water Management: Storefronts shall be designed and installed to allow for penetrating moisture to drain to the exterior. Provide end dams at sill flashing, water deflectors, sealed horizontal joints, weep slots and baffles, and other methods for water management. Show water management provisions on the shop drawings.
- H. Thermally Improved Construction: Frames and sashes shall have an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.
- I. Thermal Transmittance: NFRC 100 maximum U-factor as indicated on the Drawings or as required by California T24.
- J. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC as indicated on the Drawings or as required by California T24.

1.03 SUBMITTALS

- A. Product Data: Furnish product data for each system showing manufacturer's standard details and fabrication methods, data on finishing, hardware, and accessories, and recommendations for maintenance and cleaning.
- B. Shop Drawings: Include for fabrication and installation, including large scale elevations, plans, full scale detail sections of typical members, anchors, reinforcement, expansion provisions, and glazing. Include full scale details at head, jambs, spandrels, sill and mullions for each opening.
 1. Include structural analysis data signed and sealed by a qualified professional engineer, licensed in the State of California, responsible for their preparation. Clearly indicate all loads imposed on the primary building structure.
 2. Indicate interface with adjacent construction and flashings.
 3. Reference window types indicated on architectural window types drawings.
 4. Reference architectural elevation, plans, sections and details.
 5. Reference structural details and members.
 6. Indicate flashings, brake shape trim and closures.
 7. Show details of intersections of frame caps.
 8. Show building dimensions and proposed methods to accommodate live load deflections and column shortening.

9. Show relative layout of walls, beams, columns and slabs. Indicate tolerances required for storefront installation that can be accommodated by the storefront system.
 10. Show perimeter sealant joint sizes, including tolerances and minimum/maximum joint sizes required.
 11. Show location of anchorage points and identification of the reaction loads imposed on the structure, including dead load and wind load reactions at each anchor location.
 12. Include building elevations showing the wind loads for each portion of the building including corners and wall areas adjacent to corners.
 13. Show insulation materials, firestopping and fire safing materials.
 14. Show path for water drainage from the system. Show methods incorporated into the design to collect, control, contain and evacuate secondary water infiltration from glazing channels, perimeter surrounding conditions and perimeter joint sealants.
 15. Include Project-specific installation instructions and details. Include perimeter framing joint conditions and internal joinery conditions. Indicate which framing members run thru, and how joints are to be sealed. Indicate sealant continuity notches used to prevent water infiltration by capillary action in the metal-to-metal joint and internal seals.
 16. Coordinate submittal with glazing submittals.
- C. Samples for Verification: Furnish two samples of each type and color of aluminum finish selected, on 12-inch long sections of extrusions or formed shapes and 6-inch square sheets.
- D. Laboratory Test Reports: Furnish certified test reports from a qualified independent testing laboratory showing that aluminum-framed entrances and storefronts have been tested in accordance with specified test procedures and comply with specified performance characteristics. Where such testing has not been performed, test through an independent testing laboratory or agency and furnish certified test results.
- E. Warranty.
- 1.04 QUALITY ASSURANCE
- A. Manufacturer's Qualifications: A minimum of 5-years' experience in the manufacture of aluminum-framed entrances and storefronts of the types specified.
- B. Installer's Qualifications: Documented experience in the installation of systems similar to those required.
- C. Single Source Responsibility: Provide aluminum-framed entrances, storefronts and operable windows produced by a single manufacturer.
- D. Mockup: Prior to installing aluminum-framed entrances and storefronts, construct mockup for each form of construction and finish required to demonstrate aesthetic effects and qualities of materials and installation. Build mockup to comply with the following requirements:
1. Locate on-site in the location and size directed by the Architect.
 2. Notify the Architect 7-days in advance of the dates and times when mockup will be constructed.
 3. Demonstrate the proposed range of aesthetic effects and workmanship.

4. Obtain Architect's approval of mockups before beginning fabrication or ordering materials.
5. Retain and maintain mockup during construction in an undisturbed condition as a standard for judging the completed work. Approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed work.
6. Coordinate mockup work with work of other trades involved in combined mockup(s).
7. Mock-up may be part of the exterior building mock-up specified in Section 01 43 39 if approved by the Architect.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver aluminum-framed entrances and storefronts in the manufacturer's original protective packaging.
- B. Store aluminum components in a clean, dry location away from uncured concrete. Cover components with waterproof paper, tarpaulin or polyethylene sheeting in a manner to permit circulation of air.
 1. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.

1.06 PROJECT CONDITIONS

- A. Field Measurements: Check openings by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication with construction progress to avoid delay of the work.

1.07 WARRANTY

- A. Furnish written warranty covering aluminum-framed entrances and storefronts that fail in materials or workmanship within 2-years from date of Substantial Completion. Failures include but are not limited to structural failures including excessive deflection, excessive leakage or air infiltration, faulty operation, and deterioration of materials beyond normal weathering.
- B. Warrant anodized finish to be free from defects in materials and workmanship for a period of 5-years from date of Substantial Completion.
- C. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. Kawneer Company "MetroView FG 501T Window Wall", Arcadia, Oldcastle BuildingEnvelope, CRL / US Aluminum or approved equal.

2.02 MATERIALS

- A. Aluminum Extrusions: 6063-T6 alloy and temper. Aluminum shall have a minimum 50-percent mixed pre- and post-consumer recycled content.
- B. Aluminum Sheet: ASTM B209.
- C. Fasteners: Series 300 nonmagnetic stainless steel.

1. Do not use exposed fasteners except for application of hardware. For application of hardware, use Phillips flat-head machine screws countersunk flush that match the finish of member or hardware item being fastened.
- D. Concealed Flashing: Dead-soft stainless steel or extruded aluminum as selected by manufacturer for compatibility with other components.
- E. Brackets and Reinforcements: Aluminum or nonmagnetic stainless steel. Provide non-staining, non-ferrous shims for installation and alignment as required.
- F. Weatherstripping: Manufacturer's standard replaceable type. Provide weatherstripping on meeting stiles of pairs of doors and at bottom rail of each door leaf.
- G. Framing System Gaskets: Compression type, replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.
- H. Sealants: Manufacturer's standard, recommended by manufacturer for joint type.
- I. Reinforcing: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B633 for SC 3 severe service conditions or other suitable zinc coating. Reinforcing members shall provide sufficient strength to withstand required design pressures.
- J. Thermal Barrier: Manufacturer's standard with a 3/8-inch separation consisting of a two-part chemically curing, high-density polyurethane, mechanically and adhesively joined to framing sections.

2.03 COMPONENTS

- A. Storefront Framing Systems: Provide storefront and entrance framing systems fabricated from extruded aluminum members of size and profile indicated. Include sub-frames and other reinforcing members as required. Provide for center glazed, glazed from the interior on all sides without projecting stops. Shop-fabricate and preassemble frame components where possible. Provide storefront frame sections without exposed seams. Provide compensating channels.
 1. Sightline: 2-1/4-inch.
 2. System Depth: 5-inches.
 3. Glazing System: Four-sided captured, front glazing plane, inside or outside glazed system as indicated or as selected by the Architect.
- B. Stile-and-Rail Type Entrance Doors: Door corner construction shall consist of mechanical clip fastening, SIGMA deep penetration and fillet welds.
 1. Glazing: Fabricate doors to facilitate replacement of glass or panels, without disassembly of stiles and rails. Provide snap-on extruded aluminum glazing stops, with exterior stops anchored for non-removal.
 2. Design: As indicated.
 3. Each door leaf shall be equipped with an adjusting mechanism located in the top rail near the lock stile, which provides for minor clearance adjustments after installation.
- C. Miscellaneous Brake Shapes: Provide headers, closures, anchors and supports, including gypsum board adapters, as indicated and required. Fabricate from minimum 0.090-inch aluminum unless otherwise indicated.

2.04 FABRICATION

- A. General: Fabricate aluminum-framed entrances and storefronts to designs, sizes and thicknesses indicated, and to comply with specified standards. Sizes and profile requirements are indicated.
- B. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5. Provisions for field replacement of glazing from interior or exterior as standard for installed storefront framing.
 - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- C. Prefabrication: Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site. Disassemble components only where necessary for shipment and installation.
 - 1. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces. Complete these operations for hardware prior to application of finishes.
 - 2. Do not drill and tap for surface-mounted hardware items until time of installation at Project site.
- D. Welding: Comply with AWS recommendations. Grind exposed welds smooth to remove weld spatter and welding oxides. Restore mechanical finish.
 - 1. Welding behind finished surfaces shall be performed to minimize distortion and discoloration on the finished surface.
- E. Reinforcing: Install reinforcing as required for hardware, performance requirements, sag resistance and rigidity.
- F. Dissimilar Metals: Separate dissimilar metals with bituminous paint, suitable sealant, elastomeric tape, or gasket between the surfaces. Do not use coatings containing lead.
- G. Continuity: Maintain accurate relation of planes and angles with hairline fit of contacting members.
- H. Conceal fasteners wherever possible.
- I. Weatherstripping: For exterior doors, provide compression weatherstripping against fixed stops. At other edges, provide sliding weatherstripping retained in adjustable strip mortised into door edge.
- J. Provide miscellaneous aluminum brake metal closures and flashings as indicated, finished to match aluminum-framed entrances and storefronts.

2.05 FINISHES

- A. Exposed surfaces shall be free of scratches and other blemishes.
- B. Exposed surfaces shall be finished with a Class I integral or electrolytically-deposited color anodized finish conforming to AA-M12C22A42/A44, color as selected by the Architect from within standard industry colors and color density range.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions with installer present, for compliance and requirements for installation tolerances and other conditions affecting performance of the work.
- B. Do not begin installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Comply with manufacturer's instructions and recommendations for installation.
- B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Install components in proper alignment and relation to established lines. Provide proper support and anchor securely in place
- C. Installation Tolerances:
 - 1. Variation from Plane: Do not exceed 1/8-inch in 12-feet of length or 1/4-inch in any total length.
 - 2. Offset from Alignment: The maximum offset from true alignment between two identical members abutting end-to-end in line shall not exceed 1/16-inch.
 - 3. Diagonal Measurements: The maximum difference in diagonal measurements shall not exceed 1/8-inch.
 - 4. Offset at Corners: The maximum out-of-plane offset of framing at corners shall not exceed 1/32-inch.
- D. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
 - 1. Paint dissimilar metals where drainage from them passes over aluminum.
 - 2. Paint aluminum surfaces in contact with mortar or concrete with alkali-resistant coating.
 - 3. Paint wood and similar absorptive material in contact with aluminum and exposed to the elements or otherwise subjected to wetting, with 2-coats of aluminum house paint. Seal joints between the materials with sealant.
- E. Drill and tap frames and doors and apply surface-mounted hardware in compliance with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.
- F. Set sill members and other members in bed of sealant or use joint fillers or gaskets to provide weathertight construction. Comply with requirements of Section 07 92 00.
- G. Where flashings are indicated adjacent to work specified in this Section, provide flashings in 0.040-inch aluminum unless otherwise indicated, finished to match entrances and storefronts.

- H. Set miscellaneous brake shapes flush with hairline joints to adjacent storefront systems.

3.03 ADJUSTING

- A. Adjust operating hardware to function properly for smooth operation without binding, and to prevent tight fit at contact points and weatherstripping.

3.04 FIELD QUALITY CONTROL

A. General:

1. Cost of specified testing will be paid for by the Owner.
2. The Contractor is responsible for scheduling and making all arrangements for testing.
3. Testing shall be done as soon as possible after installation before gypsum board and interior finishes are installed.
4. Notify the storefront, curtain wall, or sloped glazing installer and manufacturer of the test schedule a minimum of one week prior to testing.

B. Water Penetration Testing:

1. Quantity: Location of storefronts, curtain walls or sloped glazing systems to be field tested will be identified by the Architect prior to testing. Assume a minimum of one field test will be required for every 1- to 2-percent of installed storefront, curtain wall, and sloped glazing.
2. Testing Agency: Engage an AAMA accredited independent testing and inspecting agency to perform field tests and to prepare test reports in accordance with the applicable AAMA Field Testing Specification:
 - a. AAMA 503-14 *"Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems"*.
 - b. AAMA 511-08 *"Voluntary Guideline for Forensic Water Testing of Fenestration Products"*.
3. Testing Methodology: Testing of storefronts, curtain walls and sloped glazing systems for water resistance shall be performed according to ASTM E1105 test method and applied per the AAMA 503 with perimeter sealant joints and subframe/receptor and/or sill pan installed. Test pressure shall be equal to 2/3 of the original laboratory tested and rated performance level and shall be tested using a non-cyclic static pressure based on ASTM E1105, Procedure A.
4. Test Reports: Prepare according to AAMA 503.
5. Products that do not pass the initial field testing shall be analyzed by the installer and storefront, curtain wall or sloped glazing system manufacturer's representative. Upon finding the source of the issue, repairs or enhancements shall be made as required to pass the specified test pressure.
 - a. Retesting of the storefronts, curtain walls or sloped glazing systems shall be completed at no additional cost to the Owner.

- b. If retesting is required, furnish written documentation identifying the steps taken to remediate the failed test.
 - c. If the source of water leakage cannot be determined by retesting, a forensic evaluation using the procedures in AAMA 511 shall be used to determine the source of the water leakage.
- C. Air Infiltration Test: Conduct tests in accordance with ASTM E783. Allowable air infiltration shall not exceed 1.5 times the amount specified in the laboratory performance requirements.
- D. Repair or remove work that does not meet requirements or that is damaged by testing at no additional cost to the Owner.

3.05 CLEANING

- A. Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings.
- B. Clean glass surfaces after installation, complying with the requirements specified in Section 08 80 00. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

3.06 PROTECTION

- A. Institute protective measures required throughout the remainder of the construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.
- B. Provide adhered, non-marring strippable plastic protection over all framing members at time of installation, prior to glazing.

END OF SECTION

SECTION 08 43 36

FOLDING STOREFRONT SYSTEM

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing sliding/folding aluminum and glass door system, including aluminum frame, threshold, panels, sliding/folding and locking hardware, weather stripping, and glass and glazing.
- B. Related Sections:
 - 1. Sheet metal flashing and trim is specified in Section 07 62 00.
 - 2. Joint sealants are specified in Section 07 92 00.
 - 3. Aluminum-framed entrances and storefronts are specified in Section 08 41 13.
 - 4. Aluminum windows are specified in Section 08 51 13.
 - 5. Glazing is specified in Section 08 80 00.

1.02 SUBMITTALS

- A. Shop Drawings: Indicate dimensions, construction, component joining, connections and locations, and hardware locations.
- B. Product Data: Manufacturer's literature including Owner's Manual and test data listing performance criteria.
- C. Samples: Two samples of each required finish on 12-inch-long typical door member.
- D. Warranty.

1.03 QUALITY ASSURANCE

- A. Manufacturer: Minimum 10-years' experience providing folding storefront systems of the type required for this Project.
- B. Performance Criteria:
 - 1. Air Infiltration: Maximum air leakage of 0.3-cfm/sq. ft. when tested according to ASTM E283 and NFRC 400 at a static air pressure difference of 1.6-psf.
 - 2. Water Penetration under Static Pressure: Provide system with a raised sill that do not evidence water penetration when tested according to ASTM E331 and ASTM E547 at a static air pressure difference of 5.25-psf.
 - 3. Structural Test Performance:

- a. Uniform Load Deflection at Design Pressure, ASTM E330: No deflection.
- b. Uniform Load Structural Performance, ASTM E330: 0.046-inch at 60-psf.
- 4. Forced Entry Resistance: Provide system that when tested according to ASTM F842 and AAMA 1304 there was no entry.
- 5. Overall DP Rating: DP35.
- C. Folding storefronts shall have a maximum U-value and SHGC as indicated on the Drawings or as required California T24.
- D. Installer: Minimum 3-years' experience installing folding storefront systems of the type required for this Project.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver doors and accessories in manufacturer's original packaging, identified with manufacturer's name, name and type of product, and finish.
- B. Store off the ground in an upright position, protected from weather and damage.
- C. Handle to prevent twisting and other damage.
- D. Conform to additional requirements of the manufacturer.

1.05 WARRANTY

- A. Warrant sliding/stacking storefront system to be free from defects in materials and workmanship for a period of 10-years from date of Substantial Completion.
- B. Warrant anodized finish to be free from defects in materials and workmanship for a period of 5-years from date of Substantial Completion.
- C. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURER

- A. EZ-Fold-A-Door "High Efficiency Architectural Aluminum (AZ-57)", Nana Wall Systems, Inc., Fleetwood Windows & Doors or approved equal.

2.02 MATERIALS

- A. Frame and Panels: From manufacturer's standard profiles, provide head jamb, side jambs, and panels with dimensions indicated.
 - 1. Aluminum: Extrusions with nominal thickness of .098-inch (2.5mm). Alloy specified as AlMgSi 0.5 with strength rated as 6063-T5.

2. Thermally broken with polyamide plastic reinforced with glass fibers.
- B. Glass: Clear tempered insulating glass with Low E coating. Provide APTK or EPDM gaskets and extruded aluminum snap-in glazing bead for dry glazing per manufacturer's instructions. Glass shall comply with safety glazing requirements of ANSI Z97.1 and CPSC 16CRF 1201.
- C. Locking Hardware and Handles: Provide manufacturer's standard handle and concealed three-point locking hardware operated by 180-degree turn of handle between each pair of bi-folding panels and on swing panels of configurations with a swing panel.
 1. Handle Finish: As selected by the Architect.
 2. Aluminum locking rods capped by Polyamide at top and bottom tracks.
 3. Provide handle height as indicated or as directed by the Architect.
- D. Sliding/Folding Hardware: Provide manufacturer's standard combination sliding and bi-folding hardware with top and bottom tracks.
 1. For each pair of bi-folding panels, provide upper guide carriage and four wheeled coated with toughened Polyamide lower running carriage. The running gear to be floor mounted and to lie above the water run-off level. Carrying capacity of lower running carriage to be 440-pounds.
 2. Provide stainless steel hinges and stainless-steel security hinge pins with set screw.
 3. Adjustment: Provide system capable of specified amount of adjustments without removing panels from tracks.
- E. Other Components:
 1. Threshold: Provide thermally broken with polyamide plastic. aluminum flush sill: finish as selected by the Architect.
 2. Weather Stripping: Provide manufacturer's standard double layer APTK, EPDM, or brush seals at both the inner and outer edge of door panels or on frame for sealing between panels and between panel and frame.
 3. Provide tapered pins or machine screws for connecting frame components.

2.03 FABRICATION

- A. Use extruded aluminum frame and panel profiles, corner connectors and hinges, sliding and folding hardware, locking hardware and handles, glass and glazing and weather stripping as specified herein to make a folding glass wall. Factory pre-assemble as is standard for manufacturer and ship with all components and installation instructions.
- B. Sizes and Configurations: See drawings for selected custom dimensions within maximum frame sizes possible as indicated in manufacturer's literature. See drawings for selected number of panels and configuration.

2.04 FINISHES

- A. Exposed surfaces shall be free of scratches and other blemishes.
- B. Exposed surfaces shall be finished with a Class I integral or electrolytically-deposited color anodized finish conforming to AA-M12C22A42/A44, color as selected by the Architect from within standard industry colors and color density range.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify the structural integrity of the header with the deflection limited to less than $L/720$ of the span with a maximum deflection of 3/8-inch.
- B. Examine surfaces of openings and verify dimensions; verify rough openings are level, plumb, and square, with no unevenness, bowing, or bumps on floor.
- C. Installation of units constitutes acceptance of existing conditions.

3.02 INSTALLATION

- A. Install frame in accordance with manufacturer's recommendations and installation instructions.
- C. Installer to provide anchorage devices and to securely and rigidly fit frame in place, absolutely level, straight, plumb and square. Install frame in proper elevation, plane and location, and in proper alignment with other work.
- D. If necessary, provide drain connections from lower track.
- E. Install panels, handles and lock set in accordance with manufacturer's recommendations and installation instructions.
- F. Adjust hardware for proper operation.
- G. Accessories: Screens; install in accordance with manufacturer's recommendations and installation instructions.

3.03 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing agency to perform specified testing.
- B. Water Penetration: Test areas of installed folding storefront framing systems where directed by the Architect for compliance with system performance requirements according to ASTM E1105 at minimum differential pressure of 3-psf which represents a 1/3 reduction in the specified laboratory amount.
- C. Air Infiltration Test: Conduct tests in accordance with ASTM E783. Allowable air infiltration shall not exceed 1.5 times the amount specified in the performance requirements. One of each type of unit will be tested at 5-, 10- and 90-percent installation.

- D. Repair or remove work that does not meet requirements or that is damaged by testing; replace to conform to specified requirements.

END OF SECTION

SECTION 08 51 13
ALUMINUM WINDOWS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing aluminum fixed windows.
- B. Related Sections:
 - 1. Sheet metal flashing and trim is specified in Section 07 62 00.
 - 2. Joint sealants are specified in Section 07 92 00.
 - 3. Aluminum-framed entrances and storefronts are specified in Section 08 41 13.
 - 4. Folding storefront system is specified in Section 08 43 36.
 - 5. Glazing is specified in Section 08 80 00.

1.02 SYSTEM PERFORMANCE REQUIREMENTS

- A. Design Requirements: Comply with air infiltration, water penetration and structural performance requirements specified in AAMA/WDMA/CSA 101/I.S.2/A440 for the type, performance class and performance grade of window units specified.
- B. Laboratory Testing: Each type and size of required window shall have been laboratory tested through a recognized testing laboratory or agency, in accordance with ASTM E330 for structural performance, ASTM E283 for air infiltration, and ASTM E331 and ASTM E547 for water penetration. Furnish certified test results.
 - 1. Windows shall have a Performance Grade (PG) rating required to resist wind loads indicated on the Structural Drawings, but not less than PG40.
 - 2. Structural Performance: Provide units with no failure or permanent deflection exceeding 3-percent of any member's span after removal of the imposed load, for a positive and negative test pressure of 1.5 times specified design performance. Limit mullion deflection to L/175.
 - 3. Air Infiltration: Provide units with an air infiltration rate of not more than 0.10-cfm per sq. ft. of window area when tested at an inward test pressure of 6.24-lbs. per sq. ft.
 - 4. Water Penetration: Provide units with no water penetration as defined in the test method at an inward test pressure of 15-percent of the design pressure for LC and CW class windows and 20-percent of the design pressure for AW class windows.
- C. Thermally Improved Construction: Window frames and sashes shall have an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.
- D. Thermal Transmittance: NFRC 100 maximum whole-window U-factor as indicated on the Drawings or as required by California T24.
- E. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC as indicated on the Drawings or as required by California T24.

1.03 SUBMITTALS

- A. Product Data: Furnish product data for each type of window. Include construction details and fabrication methods, profiles and dimensions of individual components, data on hardware, accessories and finishes, and recommendations for maintenance and cleaning of exterior surfaces.
- B. Shop Drawings: Furnish shop drawings for each type of window. Include information not fully detailed in manufacturer's standard product data, including the following:
 - 1. Layout and installation details, including anchors.
 - 2. Elevations of continuous work at 1/4-inch scale and typical window unit elevations at 3/4-inch scale.
 - 3. Full-size section details of typical composite members, including reinforcement and adjacent materials.
 - 4. Hardware.
 - 5. Glazing details.
 - 6. Accessories.
- C. Samples: Furnish samples of each required aluminum finish, on 12-inch long extrusion shapes as required for window units. Where finishes involve normal color variations, include sample sets showing the full range of variations expected.
- D. Certification: Furnish certification from window manufacturer that each type, performance grade, and size of window unit complies with the requirements where the manufacturer's window units have been laboratory tested in accordance with specified tests.
- E. NFRC reports.
- F. Warranty.

1.04 QUALITY ASSURANCE

- A. Standards: Requirements for aluminum windows, terminology and standards of performance, and fabrication workmanship are those specified and recommended in AAMA/WDMA/CSA 101/1.S.2/A440 and applicable general recommendations published by AAMA/WDMA/CSA.
- B. Single Source Responsibility: Provide aluminum windows produced by a single manufacturer.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver windows and accessories in manufacturer's original packaging, clearly identified with manufacturer's name, name and type of product, and finish.
- B. Store windows off the ground in an upright position, protected from the weather and other sources of damage.
- C. Handle to prevent twisting and other damage.
- D. Comply with additional requirements of the manufacturer.

1.06 PROJECT CONDITIONS

- A. Field Measurements: Check actual window openings by accurate field measurement before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit of windows.

1.07 WARRANTY

- A. Warrant aluminum windows to be free from defective materials and workmanship for a period of 5-years from date of Substantial Completion. Failures include, but are not limited to, structural failures including excessive deflection, excessive leakage or air infiltration, faulty operation of sash and hardware, and deterioration of metals, and other materials beyond normal weathering.
- B. Warrant finish to be free from defects in materials and workmanship for a period of 5-years from date of Substantial Completion.
- C. This warranty is in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. Kawneer, Kawneer, Wausau Window and Wall Systems or approved equal.

2.02 MATERIALS

- A. Aluminum Extrusions: 6063-T5 alloy and temper unless otherwise recommended by window manufacturer for strength, corrosion resistance, and application of required finish.
- B. Fasteners: Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.
 - 1. Where fasteners screw-anchor into aluminum less than 0.125-inch thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard non-corrosive pressed-in splined grommet nuts.
 - 2. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For application of hardware, use fasteners that match the finish of the member and hardware being fastened.
- C. Anchors, Clips and Window Accessories: Fabricate units of aluminum, nonmagnetic stainless steel, or hot-dip zinc coated steel or iron complying with ASTM B633.
- D. Sealant: For sealant required within fabricated window units, provide type recommended by the manufacturer for joint size and movement. Sealant shall remain permanently elastic, non-shrinking, and non-migrating.
- E. Glazing: Clear insulating glass with Low E coating, as specified in Section 08 80 00.
- F. Weatherstripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

2.03 ACCESSORIES

- A. Miscellaneous Brake Shapes: Provide headers, closures, anchors and supports, including gypsum board adapters, as indicated and required. Fabricate from minimum 0.090-inch aluminum unless otherwise indicated.

- B. Subsills: Thermally broken, extruded aluminum subsills in configurations indicated.
- C. Insect Screens: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
 - 1. Type and Location: Full, outside where possible for window type.
 - 2. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
 - 3. Glass-Fiber Mesh Fabric: 18-by-14 or 18-by-16 mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D 3656. Manufacturer's standard mesh color.

2.04 WINDOW HARDWARE

- A. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.
 - 1. Exposed Hardware Color and Finish: As selected by the Architect from manufacturer's full range.
- B. Projected / Casement Window Hardware:
 - 1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets. Type and style as selected by the Architect from manufacturer's full range of types and styles.
 - 2. Hinges: Non-friction type, not less than two per sash.
 - 3. Lock: Lever handle and cam-action lock with keeper.
 - 4. Limit Devices: Concealed friction adjustor, adjustable stay bar limit devices designed to restrict sash opening. Limit clear opening to 6 inches for ventilation; with custodial key release.
- C. Horizontal-Sliding Window Hardware:
 - 1. Sill Cap/Track: Extruded-aluminum track with natural anodized finish, of dimensions and profile indicated; designed to comply with performance requirements indicated and to drain to the exterior.
 - 2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
 - 3. Roller Assemblies: Low-friction design.

2.05 FABRICATION

- A. General: Fabricate aluminum window units to comply with specified standards. Include a complete system for assembly of components and anchorage of window units.

1. Provide units that are re-glazable without dismantling sash or ventilator framing.
 2. Mechanical fasteners, welded components and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and sash corners.
- B. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to the exterior.
- C. Glazing Stops: Provide snap-on glazing stops, coordinated with glass thickness. Finish glazing stops to match window units.
- D. Pre-glazed Fabrication: Pre-glaze windows at the factory where possible and practical for glass sizes and installation systems. Comply with Section 08 80 00 and ANSI/AAMA/WDMA 101/I.S.2/A440.
- E. Frame components shall be mitered, or butt jointed. All joints shall be welded; mechanical fasteners are not acceptable.

2.06 FINISH

- A. Exposed surfaces shall be free of scratches and other blemishes.
- B. Exposed surfaces shall be finished with a Class I integral or electrolytically-deposited color anodized finish conforming to AA-M12C22A42/A44, color as selected by the Architect from within standard industry colors and color density range.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect openings before beginning installation. Verify that rough opening is correct, and the sill plate is level.
- B. Metal surfaces shall be dry; clean; free of grease, oil, dirt, rust and corrosion, and welding slag; without sharp edges or offsets at joints.

3.02 INSTALLATION

- A. Comply with manufacturer's specifications and recommendations for installation of windows, hardware, operators, and other components.
- B. Set units plumb, level, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.
- C. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with AAMA/WDMA/CSA 101/I.S.2/A440.
- D. Set sill members and other members in bed of compound or with joint fillers or gaskets, to provide weathertight construction. Coordinate installation with wall flashings and other components.
1. Compounds, joint fillers, and gaskets to be installed after installation of windows are specified as work in Section 07 92 00.
- E. Where flashings are indicated adjacent to windows, provide in 0.040-inch aluminum finished to match windows.

3.03 ADJUSTING

- A. Adjust operating sash and hardware to provide a tight fit at contact points and at weatherstripping for smooth operation and a weathertight closure.

3.04 FIELD QUALITY CONTROL

- A. General: Cost of specified testing will be paid for by the Owner. The Contractor is responsible for scheduling and making all arrangements for testing. Testing shall be done as soon as possible after installation before gypsum board and interior finishes are installed. Notify the window installer and manufacturer of the test schedule a minimum of one week prior to testing.
- B. Water Penetration Testing: A minimum of 1- to 2-percent of windows in the Project, but not less than three tests of each window type and configuration, shall be performed. Tests shall be performed at 5-percent, 50-percent, and 90-percent levels of complete installation.
 - 1. Testing Agency: Engage an AAMA accredited independent testing agency to perform field tests and to prepare test reports in accordance with the applicable AAMA Field Testing Specification:
 - a. AAMA 502-12 *"Voluntary Specification for Field Testing of Newly Installed Fenestration Products"*.
 - b. AAMA 511-08 *"Voluntary Guideline for Forensic Water Testing of Fenestration Products"*.
 - 2. Testing Methodology: Testing of windows for water resistance shall be performed according to ASTM E1105 test method and applied per the AAMA 502 with perimeter sealant joints and subframe/receptor and/or sill pan installed. Test pressure shall be equal to 2/3 of the original laboratory tested and rated performance level. Tests shall be performed using a cyclic static water test based on ASTM E1105, Procedure B. AW Grade windows shall be tested to ASTM E1105 Procedure A non-cyclic static pressure.
 - 3. Test Reports: Prepare according to AAMA 502.
 - 4. Products that do not pass the initial field testing shall be analyzed by the installer and manufacturer's representative. Upon finding the source of the issue, repairs or enhancements shall be made as required to pass the specified test pressure.
 - a. Retesting of the windows shall be completed at no additional cost to the Owner.
 - b. If retesting is required, furnish written documentation identifying the steps taken to remediate the failed test.
 - c. If the source of water leakage cannot be determined, a forensic evaluation using the procedures in AAMA 511 shall be used to determine the source of the water leakage.
- C. Air Infiltration Test: Conduct tests in accordance with ASTM E783. Allowable air infiltration shall not exceed 1.5 times the amount specified in the laboratory performance requirements.
- D. Repair or remove work that does not meet requirements or that is damaged by testing at no additional cost to the Owner.

3.05 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances. Keep protective films and coverings in place until final cleaning.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for interior and exterior glass and glazing.
- B. Related Sections:
 - 1. Aluminum-framed entrances and storefronts are specified in Section 08 41 13.
 - 2. Folding storefront system is specified in Section 08 43 36.
 - 3. Aluminum windows are specified in Section 08 51 13.

1.02 DEFINITIONS

- A. Deterioration of insulating glass is defined as failure of hermetic seal due to other causes than breakage which results in intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coating resulting from seal failure, and any other visual evidence of seal failure or performance.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide glass and glazing that has been produced, fabricated, and installed to withstand normal thermal movement, wind loading and impact loading (where applicable), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glass and glazing materials and other defects in the work.
- B. Normal thermal movement is defined as that resulting from an ambient temperature range of 120-deg. F. and from a consequent temperature range within glass and glass framing members of 180-deg. F.
- C. Provide heat strengthened glass lites where recommended by glass manufacturer as determined by glass stress analysis calculations based on glass unit sizes indicated and shading patterns occurring on the glass. Furnish copies of the glass stress analysis calculations and show the location of glass units required to be heat strengthened on the shop drawings.

1.04 SUBMITTALS

- A. Product Data: Manufacturer's technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.
- B. Samples: 12-inch square samples of each type of glass indicated and specified except for clear single pane units, and 12-inch long samples of each type of sealant or gasket exposed to view.
- C. Shop Drawings: Show location of exterior glass units required to be heat strengthened based on glass stress analysis calculations.
- D. Calculations: Furnish calculations showing glass stresses based on glass lites and shading patterns. Calculations shall be prepared by the glass manufacturer and shall be signed by a registered professional engineer licensed in the State of California.
- E. Warranty.

1.05 QUALITY ASSURANCE

- A. Glazing Standards: Comply with recommendations of the following manufacturer and associations except where more stringent requirements are specified:
 - 1. Glass Association of North America (GANA) "Glazing Manual" and "Sealant Manual".
 - 2. Sealed Insulating Glass Manufacturers Association (SIGMA): TM-3000 "Vertical Glazing Guidelines".
- B. Safety Glass: Where safety glass is indicated or required, provide products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.
- C. Insulating Glass Certification Program: Provide insulating glass units permanently marked with appropriate Insulating Glass Certification Council (IGCC) certification label.
- D. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that required for this Project, with a record of successful in-service performance.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials during delivery, storage, and handling; comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture, temperature changes, direct exposure to sun and from other causes.

1.07 PROJECT CONDITIONS

- A. Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when glazing channel substrates are wet.
- B. Install glazing sealants at ambient and substrate temperatures above 40-deg. F.

1.08 WARRANTY

- A. Insulating Glass: Furnish written warranty signed by glass manufacturer, agreeing to furnish replacements for those insulating glass units developing manufacturing defects as defined, within 10-years from date of Substantial Completion.
- B. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 GLASS PRODUCTS

- A. Sizes: Fabricate glass to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer. Thickness as indicated, specified, or recommended by glass manufacturer.
- B. Manufacture heat-treated glass by horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed.

2.02 GLASS TYPES

- A. Clear Insulating Glass with Low E Coating: Vitro Architectural Glass "Solarban 70" or approved equal insulating glass with Low E coating, tempered where indicated or required by code. Glass thicknesses as indicated or as standard with door and window manufacturer.
- B. Clear Tempered Float Glass: 1/4-inch-thick clear tempered float glass.

2.04 ELASTOMERIC GLAZING SEALANTS

- A. General: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants with performance characteristics suitable for applications indicated and conditions at time of installation.
 - 1. Compatibility: Select sealants with proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
 - 2. Suitability: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants which have performance characteristics suitable for applications indicated and conditions at time of installation.
 - 3. Colors: Color of exposed sealant as selected by Architect from manufacturer's standards.
- B. Silicone Glazing Sealant: One-part elastomeric silicone sealant complying with ASTM C920, Type S, Grade NS, Class 25, Uses NT, G, A and O as applicable; Dowsil "999", GE "SCS 1200", Rhone-Poulenc, Inc. "Rhodorsil 3B", Tremco "Proglaze" or approved equal.

2.05 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100-percent, non-staining, and non-migrating in contact with nonporous surfaces, with or without spacer rod as recommended by tape and glass manufacturers for application indicated, packaged in rolls with a release paper backing, complying with AAMA 800.
- B. Expanded Cellular Glazing Tape: Closed-cell, polyvinyl chloride foam tape, factory coated with adhesive on both surfaces, packaged on rolls with release liner protecting adhesive, and complying with AAMA 800 for product 810.5.

2.06 GLAZING GASKETS

- A. Dense Elastomeric Compression Seal Gaskets: Molded or extruded neoprene, EPDM, or silicone gaskets of profile and hardness required to maintain watertight seal; complying with ASTM C864, D.S. Brown Co., Maloney, Tremco or approved equal.
- B. Soft Compression Gaskets: Extruded or molded closed cell, integral-skinned neoprene, EPDM, or silicone of profile and hardness required to maintain watertight seal; complying with ASTM C509, Type II, black; D.S. Brown Co., Maloney, Tremco or approved equal.

2.07 MISCELLANEOUS GLAZING MATERIALS

- A. Compatibility: Provide materials with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Neoprene, EPDM or silicone blocks as required, 80 to 90 Shore A durometer hardness.

- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement.
- F. Plastic Foam Joint Fillers: Preformed, compressible, resilient, non-staining, non-extruding, non-outgassing, strips of closed-cell plastic foam of density, size, and shape to control sealant depth and otherwise contribute to produce optimum sealant performance.

2.08 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.
- B. Clean cut or flat grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect work for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; presence and functioning of weep system on framing having weeps; existence of minimum required face or edge clearances; and for effective sealing of joinery. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean glazing channels and other framing members to receive glass. Remove coatings which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are to be used.

3.03 GLAZING, GENERAL

- A. Comply with printed recommendations of glass, sealants, gaskets, and other glazing materials manufacturers.
- B. Coordinate with framing system manufacturers for proper glazing channel dimensions to provide for necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with acceptable tolerances.
- C. Protect glass from edge damage during handling and installation.
 - 1. Use a rolling block in rotating glass units to prevent damage to corners. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening.
 - 2. Remove and dispose of glass units with edge damage or other imperfections of a kind that would weaken glass when installed and impair performance and appearance.
- D. Apply primers to joint surfaces where required for sealant adhesion.
- E. Install setting blocks of proper size in sill rabbet, located to comply with referenced glazing standard. Set blocks in thin course of sealant.

- F. Provide spacers inside and out, of size and spacing to preserve required face clearances for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking to comply with requirements of referenced glazing standard except where otherwise required by glass unit manufacturer.
- H. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- J. Square cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.04 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 in one continuous length. Do not stretch tapes to make them fit opening.
- C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each lite is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward center of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.05 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Secure compression gaskets in place with joints located at corners to compress gaskets producing a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- C. Install gaskets so they protrude past face of glazing stops.

3.06 SEALANT GLAZING (WET)

- A. Install continuous spacers between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel weep systems until sealants cure. Secure spacers 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. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

3.07 PROTECTION AND CLEANING

- A. Protect glass from breakage. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances. Remove immediately by methods recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction for build-up of dirt, scum, alkali deposits or staining. Remove as recommended by glass manufacturer.
- D. Remove and replace glass which is broken, chipped, cracked, abraded or damaged during construction, including natural causes, accidents and vandalism.
- E. Wash glass on both faces not more than 4-days prior to date scheduled for inspection for Substantial Completion. Use methods recommended by glass manufacturers.

END OF SECTION

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing light-gauge non-load bearing wall framing systems, including metal studs, wall furring, and backing plates.
- B. Related Sections:
 - 1. Rough carpentry is specified in Section 06 10 00.
 - 2. Acoustical joint sealants are specified in Section 07 92 19.
 - 3. Metal suspension systems are specified in Section 09 22 26.
 - 4. Glass-mat faced gypsum backing boards are specified in Section 09 28 16.
 - 5. Gypsum board is specified in Section 09 29 00.
 - 6. Acoustic insulation is specified in Section 09 81 00.

1.02 DESIGN AND PERFORMANCE REQUIREMENTS

- A. General: Where stud gauge and spacing is not indicated, engineer non-structural metal framing to comply with the following requirements.
- B. Stud Systems: Select steel studs in accordance with manufacturer's standard load tables and the following deflection criteria, based on stud depth and spacing indicated and partition height required:
 - 1. Partitions to Receive Gypsum Board: L/240.
 - 2. Partitions to Receive Tile Backer Board: L/360.
 - 3. Framed Ceilings: L/360.
- C. Structural supports and blocking for light fixtures and miscellaneous wall- or ceiling-mounted items not detailed on the Drawings shall be designed and engineered by Contractor.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's specifications and installation instructions for each type of metal support system, including provisions for fixture and equipment anchorage.
- B. Shop Drawings: Show provision for fixture and equipment anchorage to stud systems different from typical systems or details indicated.

1.04 QUALITY ASSURANCE

- A. Tolerances: Provide metal studs and furring installations that are plumb, true, straight, and rigid.
- B. Welder's Qualifications: AWS D1.1 and 1.3 as applicable.

- C. Fire-Test-Response Characteristics: Provide components that comply with rating requirements specified for fire-rated assemblies under UL 2079 for non-load bearing wall systems.
 - 1. Deflection Clips and Firestop Track: Connections and/or top runner provided in fire-resistance-rated assemblies shall be certified by UL 2079 for cyclic movement requirements.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver products in the original unopened packages, containers, or bundles with manufacturer's label intact and legible.
- B. Remove products delivered in broken, damaged, rusted, or unlabeled condition from the Project site immediately.
- C. Protect products from rusting and other sources of damage.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. ClarkDietrich Building Systems, Consolidated Systems, Inc., SCAFCO, The Steel Network Inc. or approved equal.

2.02 MATERIALS

- A. Metal Studs:
 - 1. Material: Mill-certified galvanized steel conforming to ASTM A653, G40 coating, minimum yield strength 33,000-psi.
 - 2. Construction: Formed C-channel section conforming to ASTM C645.
 - 3. Size and Thickness: As indicated or as required for specified deflection criteria, based on stud depth, and spacing indicated and partition height required. If stud spacing is not indicated, space studs at 16-inches on center.
- B. Runner Tracks:
 - 1. Material: Mill-certified galvanized steel conforming to ASTM A653, G40 coating, minimum yield strength 33,000-psi.
 - 2. Construction: Formed channel section conforming to ASTM C645.
 - 3. Size: Minimum 1-inch flange width; web depth matching studs.
 - 4. Thickness: Same as studs.
- C. Vertical Slotted Deflection and Drift Track: ClarkDietrich "MaxTrak 2D (SLT/H) or approved equal head-of-wall deflection track allowing for vertical live load movement and horizontal seismic drift.
 - 1. Code Criteria: Meet required head of wall connection criteria as required by CBC and as indicated in UL2079 for cyclic wall movement.
 - 2. Yield Strength: Grade 33ksi.

3. Coating: G60.
4. Material Thickness: 43 mils (18-gauge) unless heavier gauges are indicated.
5. Leg Depth: 3-inches, designed for a total vertical movement of 2-inches.
- D. Metal Channels: Mill-certified galvanized steel conforming to ASTM C653, G40 coating, minimum yield strength 33,000-psi.
 1. Framing, Furring, and Stiffening:

<u>Size, Inches</u>	<u>Pounds per 1,000 Lineal Feet</u>
3/4 cold rolled	300
1-1/2 cold rolled	475
2 cold rolled	590
 2. Furring Channels: Minimum 20-gauge galvanized steel with knurled faces; hat-shaped or Z-section as required.
- E. Tie Wire: No. 16-gauge, galvanized, single-strand annealed steel or No. 18-gauge, galvanized, double-strand annealed steel.
- F. Screws: ASTM C1002, Type S, pan head sheet metal screws, minimum 1/2-inch length. Provide #10 x 9/16-inch wafer head screws for securing studs to deflection track.
- G. Runner Track Fasteners: Powder-actuated tempered-steel pins with corrosive resistant plating or coating, 9/64-inch diameter, minimum 1-1/8-inch penetration. The use of powder-actuated anchors is not permitted in concrete where the actual concrete strength exceeds the concrete strength at which the anchor has been tested to provide the required capacity unless the anchor capacity is verified by field testing.
- H. Backing Plates: Provide backing plates as indicated.
- I. Compression or Isolation Strips: Fiberglass, 1/2-inch nominal thickness, width equal to width of tracks or studs where used; density such that material will compress to one-half or less of loose thickness.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION

- A. Verify that conditions are satisfactory for the installation of metal support systems. Do not commence the installation until unsatisfactory conditions have been corrected.
- B. Coordinate installation of metal support systems with the installers of other related work. Review areas of potential interference and conflicts, and coordinate layout and support provisions for interfacing work.

3.02 GENERAL INSTALLATION REQUIREMENTS

- A. Install non-load-bearing steel framing members in accordance with ASTM C754, and as specified.
- B. Cutting:
 1. General: Cut framing components squarely or on angle as required to fit tightly with proper bearing against abutting members.

2. Cutting Studs: If stud web is cut more than 50-percent, or stud flanges are cut, restore stud to original strength by wire-tying, or welding on steel reinforcement.
- C. When studs extend to the underside of structural slabs, secure at top with a slip connection to accommodate slab deflection.

3.03 NON-LOAD-BEARING VERTICAL METAL FRAMING

- A. Runner Tracks: Align at floor and ceiling with partition layouts. Secure to structure with specified fasteners located 2-inches from each end and spaced not to exceed 24-inches on center.
 1. Coordinate installation of continuous isolation strips or acoustical sealant at acoustical partitions with installation of top and bottom runner tracks.
 2. Where partition comes to underside of profile metal deck, create an acoustic seal to fill the profile. Use either metal plate or fiberglass and acoustic sealant, as indicated.
 3. Notch runner tracks as required for curved partitions.
 4. Where studs extend to structure above, provide vertical deflection accommodating devices where each stud connects to structural members above.
- B. Installation of Metal Studs:
 1. Install studs spaced 16-inches on center unless otherwise indicated. Screw-fasten framing connections using a minimum of 2 screws for each connection.
 2. At partition corners and intersections, provide a minimum of 3 studs.
 3. Splice studs where required, by nesting with a minimum lap of 8-inches; fasten laps with 2 screws through each flange.
 4. Unless otherwise indicated, frame door openings with double 16-gauge vertical studs securely attached to each jamb of door frame.
 - a. At head, install runner track; cut flanges at ends, bend web 90-degrees and screw attach to jamb studs.
 - b. Install jack studs over door opening, spaced same as full-height studs.
 - c. Where control joints extend upward from door jambs, install a jack stud spaced 1/2-inch from each jamb stud. Space next full-height stud not more than 6-inches from each jamb stud.
 - d. Attach jamb studs to metal door frames with metal clips, each with 2 screws into jamb stud.
 - e. Attach jamb studs to wood door frames with pairs of wood screws, spaced 24-inches on center.
 5. Frame openings other than door openings in the same manner as for doors and install framing below sills of openings to match framing required above door heads.
 6. Frame both sides of expansion and control joints with a separate stud; do not bridge the joint with framing components.

7. Install continuous horizontal stiffeners in partitions where recommended by stud manufacturer for partition height, stud gauge, stud spacing, number of layers of gypsum board used, and anticipated stud deflection.
 8. Stiffen openings with horizontal channels. Provide one channel continuous across head of openings extending to third stud beyond on each side. Provide one channel at each frame anchor extending to third stud beyond. Wire-tie or weld horizontal channels to each stud.
- C. Chase-Wall Framing:
1. Align two parallel rows of floor and ceiling runners according to partition layout.
 2. Position steel studs vertically in runners with flanges in same direction, with studs on opposite sides of chase directly across from each other. Anchor to runners in accordance with manufacturer's instructions.
 3. Cross brace chase studs with 12-inch wide gypsum wallboard gussets or minimum 2-1/2-inch steel studs. Attach web-to-web with screws. If chase wall studs are not opposite, brace with horizontal runners and braces.
- D. Wall Furring, Direct Attachment:
1. Attach hat-shaped metal furring channels either vertically or horizontally. For furring positioned horizontally, attach a furring member not more than 4-inches from both the floor and ceiling. Secure with fasteners placed on alternate channel flanges, spaced on 16-inch centers.
 2. Attach Z-shaped metal channels vertically, spaced 16-inches on center unless otherwise indicated, with fasteners spaced 24-inches on center.
- 3.04 BACKING PLATES
- A. Install as indicated and specified for support of wall-hung cabinets, toilet partitions and accessories, and other items to be mounted on vertical surfaces.
 - B. Welding shall comply with AWS D1.3.
 - C. Paint welds with a rust-inhibitive paint.
- 3.05 HORIZONTAL FRAMED SURFACES
- A. Joist frame with studs of size, gauge and spacing indicated or as determined from manufacturer's standard tables based on specified deflection criteria.
 - B. Provide runner channels to receive studs at ceiling and walls of same gauge as studs. Secure with mechanical fasteners at 24-inches on center maximum.
 - C. Secure studs to channels with screws.
 - D. Provide furring channels in resilient sound isolation clips as indicated.
- 3.06 SOUND CONTROL WORK
- A. Specified requirements apply to framing for interior partitions indicated as sound partitions.
 - B. Isolate top and bottom runners from direct contact with structure by installing over either:
 1. Continuous compression or isolation strips as specified, or

- 2. Two continuous 1/4-inch beads of acoustical sealant specified in Section 07 92 19 applied at quarter points of track width.
- C. Studs at terminal ends of partitions abutting intersecting walls or partitions, and studs that would otherwise contact intermediate structural columns shall be similarly installed over strips or sealant.

3.07 INSTALLATION TOLERANCES

- A. Variation from Plumb: Maximum 1/8-inch in 10-feet, non-cumulative.
- B. Variation from Level: Maximum 1/8-inch in 10-feet, non-cumulative.
- C. Variation from True Plane: Maximum 1/8-inch in 10-feet, non-cumulative.
- D. Variation from True Position: Maximum 1/4-inch, non-cumulative.
- E. Variation of Member from Plane: Maximum 1/8-inch, non-cumulative.

END OF SECTION

SECTION 09 22 26

METAL SUSPENSION SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing metal ceiling suspension systems, including suspended system for gypsum board ceilings.
- B. Related Sections:
 - 1. Non-structural metal framing is specified in Section 09 22 16.
 - 2. Gypsum board is specified in Section 09 29 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's specifications and installation instructions for each type of suspension system, including provisions for fixture and equipment anchorage.
 - 1. Include ICC-ES test reports showing proposed hanger and bracing wire fasteners can support specified loads.

1.03 QUALITY ASSURANCE

- A. Ceiling-support system shall limit deflection of finished ceilings to less than L/360.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in the original unopened packages, containers, or bundles with manufacturer's label intact and legible.
- B. Remove products delivered in broken, damaged, rusted, or unlabeled condition from Project site immediately.
- C. Protect products from rusting and other sources of damage.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Metal Channels: ASTM C645, galvanized in accordance with ASTM A653, G60 coating designation.
 - 1. Framing, Furring, and Stiffening:

<u>Size, Inches</u>	<u>Pounds per 1,000 Lineal Feet</u>
3/4 cold rolled	300
1-1/2 cold rolled	475
2 cold rolled	590
 - 2. Furring Channels: Minimum 20-gauge galvanized steel with knurled faces; hat-shaped or Z-section as required.
- B. Hanger Wire: Galvanized, soft, mild annealed steel; 8-gauge, unless otherwise indicated, complying with ASTM A641.

- C. Diagonal Bracing Wire: Galvanized, soft, mild annealed steel; 12-gauge, unless otherwise indicated, complying with ASTM A641.
- D. Tie Wire: No. 16-gauge, galvanized, single-strand annealed steel or No. 18-gauge, galvanized, double-strand annealed steel.
- E. Screws:
 - 1. General: ASTM C1002, corrosion resistant, for attachment to metal framing 25-gauge and lighter; ASTM C954 for attachment to metal framing 20-gauge and heavier.
 - 2. Thread and head designs and lengths as recommended by manufacturer for uses and materials involved.
- F. Hanger and Bracing Wire Fasteners:
 - 1. Hanger Wires: Connection device capable of carrying not less than 100-pounds.
 - 2. Bracing Wires: Connection device capable of carrying not less than 200-pounds or the actual design load, whichever is greater, with a safety factor of 2 without yielding.
- G. Furring Channel Clips: Fabricated from galvanized wire, for attaching furring channels to cold-rolled channels.
- H. Compression Stiffeners: 20-gauge channel studs, 1-1/2-inches.

PART 3 - EXECUTION

3.01 SUSPENDED CEILING SUSPENSION FRAMING

- A. Space 8-gauge hanger wires 48-inches on center along carrying channels and within 6-inches of ends of carrying channels.
- B. Install 1-1/2-inch cold rolled carrying channels 48-inches on center and within 6-inches of walls. At splices, interlock flanges, overlap ends 12-inches, and wire-tie with double loops of No. 16-gauge wire.
- C. Install 3/4-inch cold rolled channels at right angles to carrying channels, spaced 24-inches on center and within 6-inches of walls. Provide one-inch clearance between furring channels and abutting walls and partitions. Attach to carrying channels by saddle-tying around carrying channels with one strand of No. 16 or two strands of No. 18-gauge tie wire. At splices, nest furring channels with a minimum 8-inch overlap and wire-tie each end with double loops of No. 16-gauge wire.
- D. Install 4-way 45-degree diagonal bracing wires at 12'-0" x 12'-0" within 6-inches of walls. Diagonal bracing wires shall be located at the intersection of main runner and cross-furring member. Provide connection between diagonal wires and main runner to prevent slipping for a 200-pound approximate seismic load.
- E. Install hanger and bracing wire anchors so the direction of the wire aligns as closely as possible with the direction of the forces acting on the wire.
- F. Separate ceiling hanging and bracing wires at least 6-inches from unbraced ducts, pipes, and conduit.
- G. Fasten wires with not less than 4 tight turns. Make all tight turns within 1-1/2-inches.
- H. Install uplift stiffener for each 144-square feet of ceiling, consisting of a vertical metal stud occurring at the junction of the carrier and furring channel. Wire tie to carrier or screw to channel and secure to overhead structure.

- I. At control joints, provide discontinuous lap in main runners occurring over joints. Do not bridge joints with cross furring where joints run perpendicular to furring. Where joints run parallel to furring, provide furring to support each side of joint.
- J. Provide recesses and openings where indicated for lighting fixtures, registers, access panels, and other items to be installed in ceilings; provide additional furring channels where required by opening.
- K. Recessed or drop-in light fixtures shall be supported directly by main runners or by supplemental framing which is supported by main runners.
- L. Surface mounted fixtures shall be attached to a main runner with a positive clamping device made of material with a minimum of 14-gauge. Rotational spring catches are not acceptable.

END OF SECTION

SECTION 09 28 16

GLASS-MAT FACED GYPSUM BACKING BOARDS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes interior glass-mat faced gypsum backing boards for tiled walls in non-wet areas.
- B. Related Sections:
 - 1. Rough carpentry is specified in Section 06 10 00.
 - 2. Non-structural metal framing is specified in Section 09 22 16.
 - 3. Gypsum board is specified in Section 09 29 00.
 - 4. Tile is specified in Section 09 30 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's data for each type of component and system specified, including performance ratings, details of construction, materials, and installation instructions.

1.03 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in their original unopened packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack tile backer boards to prevent sagging. Stack flat on continuous surface, and without skids.
- C. Handle tile backer boards to prevent damage to edges, ends or surfaces. Remove damaged or deteriorated materials from site.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURER

- A. Georgia-Pacific Corporation "DensShield Tile Backer", National Gypsum "Gold Bond eXP Tile Backer" or approved equal.

2.02 MATERIALS

- A. Glass-Mat Faced Gypsum Tile Backer Board:
 - 1. Composition: Water-resistant treated core with glass mat moisture protectant coating and glass mats both sides. The face side shall be surfaced with heat-cured copolymer water-resistant coating. Tile backer board shall comply with ASTM C1178.
 - 2. Size: Manufacturer's standard based on thickness required.
 - 3. Thickness: 1/2-inch unless 5/8-inch-thick Type X is indicated or required for fire-resistance rating.

- B. Accessories:
 - 1. Trim: Sheet steel, galvanized.
 - 2. Fasteners:
 - a. Wood Framing: Type W or Type S Hi-Lo, bugle head, rust resistant.
 - b. Metal Framing: Type S, bugle or wafer head, self-tapping, rust resistant. Provide Type S-12 for heavy-gauge framing.
- C. Joint Treatment Materials:
 - 1. Joint Tape: 2-inch wide 10 x 10 glass mesh tape.
 - 2. Reinforcing Fabric: Balanced, alkali-resistant, open-weave, glass fiber fabric, made from continuous multi-end strands with tensile strength of not less than 120-pounds and 140-pounds in warp and fill directions, respectively, in accordance with ASTM D1682; complying with ASTM D578; minimum 4.30-oz./sq. yd. minimum weight.
 - 3. Setting-Type Joint Compound at Untiled Areas: ToughRock setting compounds or as recommended by tile backer board manufacturer.
 - 4. Tile Setting Material: Latex portland cement mortar as specified in Section 09 30 00.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and framing for compliance with requirements and conditions affecting work of this Section. Do not proceed with installation until piping, waterproofing, and other in-wall work has been installed and accepted by Architect and unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Comply with manufacturer's printed installation instructions applicable to products and applications indicated, except when more stringent requirements apply.
- B. Use maximum lengths to minimize number of joints. Stagger end joints and edge joints. Attach to framing with specified fasteners spaced 6-inches on center. Butt ends and edges.
- C. Locate control and expansion joints at same locations as substrate and where required by finishes.
- D. On walls, install tile backer board panels vertically or horizontally. On ceilings, install panels perpendicular to framing.
- E. Finishing:
 - 1. Substrate for Tile: Apply glass mesh joint tape over joints. Embed tape in setting material and allow to dry prior to installing tile.
 - 2. Substrate for Untiled Areas: Apply glass mesh joint tape over joints. Embed tape in setting-type joint compound. Apply skim coat of setting-type joint compound over surface of tile backer panel for smooth finish.
- F. Install accessories in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09 29 00

GYPSUM BOARD

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing the following:

1. Gypsum board and associated accessories.

B. Related Sections:

1. Rough carpentry is specified in Section 06 10 00.
2. Gypsum sheathing is specified in Section 06 16 43.
3. Firestopping is specified in Section 07 84 00.
4. Acoustical joint sealants are specified in Section 07 92 19.
5. Non-structural metal framing is specified in Section 09 22 16.
6. Metal suspension systems are specified in Section 09 22 26.
7. Glass-mat-faced gypsum backing boards are specified in Section 09 28 16.
8. Acoustic insulation is specified in Section 09 81 00.
9. Painting is specified in Section 09 91 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's specifications and installation instructions for each type of gypsum board and accessory required.
- B. Shop Drawings: Furnish layout drawing showing proposed location of control joints.

1.03 QUALITY ASSURANCE

- A. Gypsum board work shall comply with ASTM C840 and California Building Code (CBC) Section 2508 unless otherwise indicated or specified.
- B. Installation and finishing of gypsum board shall comply with GA-216. Installation of fire-rated gypsum board shall comply with their listing descriptions indicated on the Drawings.
- C. Fire-Resistance Ratings: Where gypsum board systems with fire-resistance ratings are indicated, provide materials and installations identical with those of applicable assemblies tested in accordance with ASTM E119 by fire testing laboratories acceptable to authorities having jurisdiction.
1. Provide fire-resistance-rated assemblies identical to those indicated by reference to GA File No's. in GA-600 "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.
- D. Allowable Tolerances:

1. Gypsum board surfaces shall have no measurable variation in any 2-foot direction and a maximum variation of 1/8-inch in 10-feet when a straightedge is laid on the surface in any direction. Specified tolerances apply to both plumbness of walls and levelness of ceilings.
 2. Shim work as required to comply with specified tolerances.
 3. Do not exceed 1/16-inch offset between planes of abutting sheets at edges or ends.
- E. Mock-up: Install mock-up using approved gypsum products, including fasteners and related accessories, in accordance with manufacturer's instructions and recommendations.
1. Size: 100-square feet.
 2. Prepare mock-up for each level of exposed gypsum board finish.
 3. Approved mock-up may remain as part of the work.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
1. Deliver materials to the Project site in original package containers or bundles with manufacturer's labels intact and legible.
 2. Deliver fire-rated materials bearing the testing agency's label and classification identification.
- B. Storage:
1. Store materials indoors in a dry area, under cover, and stacked flat off the floor.
 2. Stack gypsum boards so that long lengths are not over short lengths.
- C. Handle gypsum board to avoid damaging face and edges of sheets.
- D. Protect metal corner beads and trim from being bent or damaged.

1.05 PROJECT CONDITIONS

- A. Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C840 and with gypsum board manufacturer's recommendations.
- B. Minimum Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40-deg. F. For adhesive attachment and finishing of gypsum board, maintain not less than 50-deg. F. for 48-hours prior to application and continuously thereafter until drying is complete.
- C. Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.
- D. Provide for continuous ventilation during installation, using as close to 100-percent outside air as possible.
- E. Protect workers and HVAC system from gypsum dust.
- F. Remove and replace gypsum board products that are exposed to water and display mold and mildew. Removal shall occur as soon as possible after exposure to water.

PART 2 - PRODUCTS

2.01 GYPSUM BOARD

- A. Fire-Rated Gypsum Board: USG "Sheetrock Brand Firecode X Panels" or approved equal with tapered rounded edge to minimize ridging or beading and other joint imperfections.
 - 1. ASTM C1396, regular type except where Type X fire-resistant type is indicated or required to meet UL assembly types.
 - 2. Thickness: 5/8-inch.
 - 3. Edges: Tapered long edges with face paper folded around the edge to reinforce and protect the core.
 - 4. Provide USG "Sheetrock Brand Firecode C Panels" or approved equal where required for fire-rated assemblies in Gypsum Association Fire Resistance Design Manual.
- B. Moisture-Resistant Fire-Rated Gypsum Board: USG "Sheetrock Brand Mold Tough Panels Firecode X" or approved equal noncombustible, moisture-resistant gypsum core encased in moisture- and mold-resistant, 100-percent recycled green face and brown back papers.
 - 1. ASTM C1396 for 5/8-inch, Type X, water-resistant gypsum board.
 - 2. Edges: Tapered long edges with face paper folded around the edge to reinforce and protect the core.
 - 3. Thickness: 5/8-inch.
 - 4. Achieved GreenGuard Gold Certification and qualifies as a low VOC emitting material meeting CA 01350.
 - 5. Provide USG "Sheetrock Brand Mold Tough Panels Firecode C" or approved equal where required for fire-rated assemblies in Gypsum Association Fire Resistance Design Manual.

2.02 GYPSUM BOARD ACCESSORIES

- A. Screws: ASTM C954 or ASTM C1002.
 - 1. Use Type S screws for gypsum board attachment to light steel framing.
 - 2. Use Type S-12 screws for gypsum board attachment to 20-gauge and heavier steel framing.
 - 3. Use Type G screws for gypsum board attachment to gypsum board.
 - 4. Use Type W screws for gypsum board attachment to wood framing.
- B. Metal Trim: Galvanized steel, 26-gauge minimum; profiles and dimensions indicated.
 - 1. Corner Beads: United States Gypsum "Dur-A-Bead" or approved equal.
 - 2. Casing Beads: United States Gypsum or approved equal.
 - 3. Control Joints: Roll-formed zinc with perforated flanges, 1-3/4-inch wide with 1/4-inch-wide center channel with removable tape strip over channel.
- C. Reveals: Extruded aluminum alloy 6063-T5, profiles indicated, finish as selected by the Architect.
- D. Joint-Treatment Materials: ASTM C475.

1. Drying type (ready mixed): United States Gypsum "SHEETROCK" all-purpose joint compound or approved equal.
 2. Setting-type (chemically hardening): United States Gypsum "SHEETROCK" setting-type joint compound or approved equal.
 3. Low-Dust Emission Type: United States Gypsum "SHEETROCK" Plus 3 ready-mixed lightweight all-purpose joint compounds with dust control or approved equal.
- E. Reinforcing Joint Tape: ASTM C475, 2-inch nominal width.
- F. Acoustical Sheet Sealant Pad: Harry A. Lowry & Associates, 3M or approved equal.
- G. Resilient Channels: ClarkDietrich "RC Deluxe Resilient Channel (RCSD)" or approved equal.
- H. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- I. Primer/Surfacer: United States Gypsum "SHEETROCK" Tuff-Hide" primer-surfacer or approved equal.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that conditions are satisfactory for the installation of gypsum board and accessories.
1. Check framing for accurate spacing, alignment, plumbness, and levelness. Verify that both new and existing framing members will result in gypsum board surfaces complying with specified tolerances.
 2. Verify spacing of installed framing does not exceed maximum allowable for thickness of board to be used.
 3. Verify door frames are set for thickness of board to be used.
 4. Repair protrusions of framing, twisted framing members, or unaligned members before installation of gypsum board commences.
- B. Do not commence the installation until unsatisfactory conditions have been corrected.

3.02 APPLICATION OF GYPSUM BOARD

- A. Apply materials in conformance with ASTM C840, the manufacturer's instructions, and as indicated.
- B. When gypsum board is to be applied to both walls and ceilings, apply to ceilings first.
- C. Resilient Framing:
1. Partitions: Apply resilient channels at right angles to framing. Position bottom channel with resilient channel attachment flange either up or down; position other channels with resilient channel attachment flanges down. Attach with 1-1/4-inch screws. Locate resilient channels 2-inches from floor, within 6-inches of ceiling, and not more than 24-inches on center.

2. Ceilings: Apply resilient channels at right angles to framing. Attach with 1-1/4-inch screws driven through channel attachment flange. For fire-rated, double-layer assembly, apply channels over base layer and attach with 1-7/8-inch screws driven through channel flange and base layer into joist. Fasten channels to joists at each intersection.
 - a. There shall be no contact with the free leg (flange) and the joist prior to the attachment of gypsum board.
 - b. There shall be no contact between the edge of the resilient channel and the framing.
 - c. The pre-drilled screw holes in the resilient channel shall be used.
 - d. Screws to attach the gypsum board to the resilient channel shall not be located below the joists.
 - e. The minimum number of screws required by code shall be installed through the gypsum board into the resilient channel.
- D. For partitions, apply full height sheets with long dimension parallel to framing members with abutting edges over supports. Where ceiling heights exceed 10'-0" and where required by fire resistive ratings, apply sheets with long dimension perpendicular to framing members. For ceilings, apply sheets with long dimension either perpendicular or parallel to framing members to result in fewest joints. For fire-rated assemblies, apply gypsum board in accordance with CBC Chapter 7.
- E. Use sheets of maximum lengths to minimize end joints.
- F. Neatly fit and stagger end joints.
- G. Locate joints on different studs at opposite sides of partition.
- H. Cut and fit neatly around outlets and switches. Back-to-back wall penetrations shall be at least two stud spaces apart for acoustic isolation.
- I. Double-Layer Application:
 1. Apply base layer with long dimension perpendicular to and centered on framing; apply face layer parallel to framing. Apply base layer parallel to framing where required by fire-resistive ratings.
 2. Stagger sheets of each layer so that joints of each layer are 16-inches apart.
- J. Isolation of Gypsum Board from Other Construction:
 1. Provide perimeter relief where gypsum board abuts structural decks, ceilings, vertical structural elements, or window sections.
 2. Finish gypsum board edge with corner bead.
 3. Seal space between casing bead and structure with continuous sealant bead.
 4. Seal around electrical boxes and conduit and pipe penetrations.
 5. Seal at base of gypsum board sheets.
- K. Acoustic Control Requirements for Sound Walls:

1. Leave a 1/8- to 1/4-inch space between gypsum board and adjacent construction to provide a space for acoustical sealant.
2. Seal airtight with acoustical sealant material specified in Section 07 92 19.
3. Seal penetrations through walls, or cuts in one face of walls, with a full bead of sealant at perimeter; this includes provisions for electrical outlet and switch boxes, pipes, ducts, and similar items.
4. Seal electrical boxes at the back with specified sheet sealant pad. Where wires enter the boxes, seal the openings airtight around the wires and knockout openings.
5. Install mild steel sleeves where required, fiberglass packing between sleeve or framing, penetrating item, and cover plates. Seal on both sides to render airtight.
6. Tolerance: 1/8-inch between wall boarding and sleeve, 3/8- to 5/8-inch between sleeve and service.

L. Installation of Fasteners:

1. Do not locate fasteners less than 3/8-inch from edges or ends of sheets. Do not locate fasteners less than one-inch from edges or ends in horizontal applications.
2. Fire-Rated Partitions: Install fasteners in accordance with the more restrictive of either CBC Chapter 7 or the Underwriters' Laboratories assemblies as denoted on partition schedule.
3. Non-Fire-Rated Partitions: Install fasteners in accordance with GA-216 and ASTM C840.
4. Fire-Rated Ceilings: Install fasteners in accordance with CBC Chapter 7.
5. Non-Fire-Rated Ceilings: Install fasteners spaced not more than 12-inches on center.
6. Install screws using powered screw guns with adjustable screw-depth control head. Drive shank perpendicular to gypsum board surface. Do not hammer screws.
7. Set fastener heads slightly below surface of gypsum board, but do not break or strip paper face around fastener.
8. Stagger fasteners opposite each other on adjacent ends and edges.
9. Omit fasteners at edges where metal edge trim will be installed.

M. Installation of Accessories:

1. Install corner trim at vertical and horizontal external corners and angles, and edge trim at junctions of gypsum board and other materials and at exposed edges.
2. Control Joints:
 - a. Ceilings: Maximum area for ceilings with perimeter relief shall be 2,500-sq. ft.; maximum area for ceilings without perimeter relief shall be 900-sq. ft. Do not exceed 50-feet between control joints in ceilings with perimeter relief; 30-feet between control joints in ceilings without perimeter relief.
 - b. Walls and Partitions: Maximum spacing between control joints shall not exceed 30-feet.

- c. Control joint locations shall occur only where indicated on reviewed layout drawings.

3.03 TAPING AND FINISHING

- A. Finish Levels: Provide levels of gypsum board finish for locations as follows, in accordance with Gypsum Association GA 214 "Recommended Specification: Levels of Gypsum Board Finish".
 - 1. Level 0: In areas of temporary construction, no taping or accessories are required.
 - 2. Level 1: Ceiling plenum areas and concealed areas. Provide higher level of finish as required to comply with fire-resistance ratings and acoustical ratings.
 - 3. Level 2: Not used.
 - 4. Level 3: Not used.
 - 5. Level 4: Where scheduled, joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over joints, angles, fastener heads, and accessories. Joint compound shall be smooth and free of tool marks and ridges.
 - 6. Level 5: Not used.
- B. Interior Gypsum Board Finishing:
 - 1. Taping (Level 1):
 - a. Use taping or all-purpose compound.
 - b. Butter taping compound into inside corners and joints.
 - c. Center tape over joints and press down into fresh compound.
 - d. Remove excess compound. Tape joints of gypsum board above suspended ceilings.
 - 2. First Coat (Level 2):
 - a. Use taping or all-purpose drying-type compound or setting-type joint compound.
 - b. Immediately after bedding tape, apply skim coat of compound over body of tape and allow to dry completely in accordance with manufacturer's instructions.
 - c. Apply first coat of compound over flanges of trim and accessories, and over exposed fastener heads and finish level with board surface.
 - 3. Second Coat (Level 3):
 - a. Use all purpose or topping drying type joint compound.
 - b. After first coat treatments is dried, apply second coat of compound over tape and trim, feathering compound 2-inches beyond edge of first coat.
 - 4. Third Coat (Level 4):
 - a. Use all purpose or topping drying type joint compound.

- b. After second coat has dried, sand surface lightly and apply thin finish coat to joints, fasteners, and trim, feathering compound 2-inches beyond edge of second coat.
 - c. Allow third coat to dry. Apply additional compound, and touch-up and sand, to provide surface free of visual defects, tool marks, and ridges, ready for application of finish.
- C. Cut edges and openings around pipes and fixtures shall be caulked flush with sanitary sealant as specified in Section 07 92 00.
- D. In the completed installation, gypsum board shall have plumb and straight surfaces with no waves or buckles. Joints, fastener heads, and trim flanges shall be invisible after finishing. Surfaces shall be uniformly smooth and ready for painting or other decoration.
- E. Primer/Surfacer: Complete gypsum board surface to Level 4 before applying primer-surfacer. Machine-apply with airless sprayer in conformance with manufacturer's instructions to a wet film thickness of 15- to 20-mils. Allow to dry overnight before painting.

3.04 PROTECTION OF FINISHED WORK

- A. Maintain temperature and humidity conditions as required to protect the installation.
- B. Protect completed gypsum board from damage or deterioration until final acceptance of the work.

END OF SECTION

SECTION 09 30 00

TILE

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing the following:

1. Floor tile.
2. Wall tile and base.
3. Simulated stone glass tile.

B. Related Sections:

1. Joint sealants are specified in Section 07 92 00.
2. Glass-mat-faced gypsum backing boards are specified in Section 09 28 16.

1.02 SUBMITTALS

A. Product Data: Furnish manufacturer's product data for each specified product.

B. Shop Drawings: Show tile patterns and locations and widths of expansion, contraction, and isolation joints in tile substrates and finished tile surfaces.

C. Samples for Verification: Furnish samples of the following items. Where products involve color and texture variations, furnish sets showing full range of variations expected.

1. Full-size units of each type of trim and accessory for each color required.
2. 12-inch-long samples of transition strips.

1.03 QUALITY ASSURANCE

A. Single-Source Responsibility for Tile: Obtain each color, grade, finish, type, and variety of tile from a single source with resources to provide products of consistent quality in appearance without delaying progress of the work.

B. Single-Source Responsibility for Setting and Grouting Materials: Obtain ingredients of a uniform quality from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.

C. Installer's Qualifications: A minimum of 3-years' experience installing ceramic tile of the types specified, and a minimum of 5 installations of a magnitude like the work of this Section.

D. Floor tile shall have a minimum dynamic coefficient of friction (DCOF) of 0.42 determined in accordance with ANSI A137.1-2012.

1.04 PRODUCT 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 ANSI A137.1 for labeling sealed tile packages.

B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

1.05 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Maintain temperatures at 50-deg. F. or more in tiled areas during installation and for 7-days after completion unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

1.06 EXTRA MATERIALS

- A. Furnish additional tile for replacement and maintenance, at the rate of approximately 3-percent, to the nearest full carton, for each size, color, pattern, and type installed. Identify each carton as to contents.

PART 2 - PRODUCTS

2.01 TILE MATERIALS

- A. Tile: As indicated on the Drawings or as selected by the Architect.
- B. Trim Units: Provide trim units to match adjoining flat tile.
 - 1. Size: Coordinate with sizes and coursing of adjoining flat tile.
 - 2. Shapes: As indicated or required based on tile installation methods.

2.02 SETTING MATERIALS

- A. Latex Portland-Cement Mortar: ANSI A118.4.

2.03 GROUTING MATERIALS

- A. Commercial Portland Cement Grout: ANSI A118.6, color as selected by the Architect.
- B. Dry-Set Grout: ANSI A118.6, color as selected by the Architect.
- C. Latex-Portland Cement Grout: ANSI A118.6, color as selected by the Architect.
- D. Chemical-Resistant Epoxy Grout: ANSI A118.3, color as selected by the Architect.
- E. Grout Schedule:
 - 1. Wall Tile: Commercial portland cement, dry-set, or latex-portland cement.
 - 2. Floor Tile: Epoxy.

2.04 MISCELLANEOUS MATERIALS

- A. Tile and Carpet Transition Strips: Schluter Systems or approved equal, brushed chrome finish, profiles and types indicated or required.
- B. Tile Trim: Schluter Systems or approved equal, stainless steel, profiles indicated.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine substrates and areas 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, and free from oil or waxy films and curing compounds.
 - 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.

3.02 PREPARATION

- A. Blending: For tile exhibiting color variations within the range selected, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If tile is not factory blended, return to manufacturer or blend tiles at Project site before installing.

3.03 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standard: Comply with referenced parts of ANSI 108 series of tile installation standards.
- B. TCNA Installation Guidelines: Comply with TCNA "Handbook for Ceramic Tile Installation" referenced installation methods.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions except as 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 that plates, collars or covers overlap tile.
- E. Jointing Pattern: Lay tile in pattern 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.
- F. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints during installation of setting materials, mortar beds, and tile. Do not saw cut joints after installation of tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
 - 2. Prepare joints and apply sealants as specified in Section 07 92 00.

3.04 TILE INSTALLATION METHODS

- A. Interior Floors: Thin Set over concrete slabs in accordance with ANSI A108.5 using TCNA Method F113.
- B. Interior Walls: Thin-set over glass-mat faced gypsum backing board in accordance with ANSI A108.5 using TCNA Method W245.
- C. Expansion Joints: Comply with TCNA Method EJ171. Where joint locations are not indicated, Contractor proposed joint locations shall be approved by the Architect.

3.05 CLEANING

- A. Upon completion of placement and grouting, clean tile surfaces so they are free of foreign matter.
 - 1. Remove latex-portland cement grout residue from tile as soon as possible.
 - 2. Do not use acid or acid cleaners to clean tile.
- B. Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.

3.06 CURING

- A. Damp cure tile installations, including portland cement grouts, for a minimum of 72-hours.
 - 1. Cover with clean non-staining kraft paper.
 - 2. Do not use polyethylene sheets directly over tile on horizontal surfaces.

3.07 PROTECTION

- A. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensures tile is without damage or deterioration at time of Substantial Completion.
 - 1. When recommended by tile manufacturer, apply a protective 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.
 - 2. Prohibit foot and wheel traffic from tiled floors for at least 7-days after grouting is completed.
- B. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.
- C. Apply sealer to portland cement grout installations in accordance with sealer manufacturer's recommendations. Apply to small test area and obtain Architect's approval before proceeding with application over large areas.

END OF SECTION

SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes the following:
 - 1. Resilient wall base.
 - 2. Resilient transition strips.
- B. Related Sections:
 - 1. Resilient tile flooring is specified in Section 09 65 19.

1.02 SUBMITTALS

- A. Product Data: Submit for each type of product specified.
- B. Samples: Samples for verification purposes in manufacturer's standard sizes, but not less than 12-inches long, of each color and product type specified or required.

1.03 QUALITY ASSURANCE

- A. Fire Performance Characteristics: Provide products with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Critical Radiant Flux: 0.45-watts per sq. cm or more per ASTM E648.
 - 2. Smoke Density: Less than 450 per ASTM E662.
- B. All materials shall comply with the requirements of Air Quality Management District (AQMD) Rule 1168 governing the emission of Volatile Organic Compounds.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to Project site in original manufacturer's unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store products in dry spaces protected from the weather with ambient temperatures maintained between 50- and 90-deg. F.
- C. Move products into spaces where they will be installed at least 48-hours in advance of installation.

1.05 PROJECT CONDITIONS

- A. Maintain a minimum temperature of 70-deg. F. in spaces to receive products specified in this Section for at least 48-hours prior to installation, during installation, and for not less than 48-hours after installation. After this period, maintain a temperature of not less than 55-deg. F.
- B. Do not install products until they are at the same temperature as that of the space where they are to be installed.

- C. Close spaces to traffic during installation of products specified in this Section.
- D. Provide for continuous ventilation during installation using as close to 100-percent outside air as possible.

1.06 SEQUENCING AND SCHEDULING

- A. Sequence installing products specified in this Section with other construction to minimize possibility of damage and soiling during remainder of construction period.

1.07 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage, and identified with labels clearly describing contents.
 - 1. Furnish not less than 10-linear feet for each 500-linear feet or fraction thereof of each different type and color of resilient wall base installed.

PART 2 - PRODUCTS

2.01 RESILIENT WALL BASE

- A. Resilient Wall Base: As indicated on the Drawings or as selected by the Architect.

2.02 RESILIENT ACCESSORIES

- A. Resilient Transition Strips: As indicated on the Drawings or as selected by the Architect.

2.03 INSTALLATION ACCESSORIES

- A. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- B. Trowelable Underlayment and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by flooring manufacturer for applications indicated.
- C. Adhesives: Provide VOC-compliant type and brands of solvent free water-resistant adhesive as recommended by manufacturer of resilient wall base and accessories for conditions of installation.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Comply with manufacturer's installation specifications for preparing substrates indicated to receive products indicated.
- B. Use trowelable leveling and patching compounds per manufacturers directions to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.
- D. Broom or vacuum clean substrates to be covered immediately before installing products specified in this Section. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.
- E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.

3.02 INSTALLATION

- A. Install products specified in this Section using methods indicated according to manufacturer's installation directions.
- B. Apply resilient wall base to walls, columns, pilasters, casework, and other permanent fixtures in rooms and areas where base is required. Install wall base in lengths as long as possible. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
 - 1. Install inside and exterior corners before installing straight pieces.
- C. Place resilient accessories so they are butted to adjacent materials of type indicated and bond to substrates with adhesive. Install reducer strips at edges of flooring that otherwise would be exposed.

3.03 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing installation:
 - 1. Remove visible adhesive and other surface blemishes using cleaner recommended by manufacturers of resilient product involved.
 - 2. Sweep or vacuum floor thoroughly.
 - 3. Do not wash floor until after period recommended by manufacturer.
 - 4. Damp-mop resilient accessories to remove black marks and soil.
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by manufacturer of resilient product involved.
- C. Clean products specified in this Section not more than 4 days prior to dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products using method recommended by manufacturer.

END OF SECTION

SECTION 09 65 19

RESILIENT TILE FLOORING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes the following:
 - 1. Luxury vinyl tile.
- B. Related Sections:
 - 1. Resilient base and accessories are specified in Section 09 65 13.

1.02 SUBMITTALS

- A. Product Data: Submit for each type of product specified. Include certification by tile manufacturer that products supplied for tile installation comply with local regulations controlling use of volatile organic compounds (VOC's).
- B. Samples: For verification purposes in full-size tiles of each different color and pattern of resilient floor tile specified, showing full range of variations expected in these characteristics.
- C. Maintenance data for resilient floor tile, to include in Operating and Maintenance Manual.
- D. MSDS data sheets for adhesive.

1.03 QUALITY ASSURANCE

- A. Single-Source Responsibility for Floor Tile: Obtain each type, color, and pattern of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the work.
- B. Fire Performance Characteristics: Provide resilient floor tile with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Critical Radiant Flux: 0.45-watts per sq. cm or more per ASTM E648.
 - 2. Smoke Density: Less than 450 per ASTM E662.
- C. All materials shall comply with the requirements of Air Quality Management District (AQMD) Rule 1168 governing the emission of Volatile Organic Compounds.

1.04 REGULATORY REQUIREMENTS

- A. Slip Resistant Surfaces: Conform to the more restrictive provisions of Title III of the Americans with Disabilities Act or with California Building Code (CBC).
 - 1. Resilient flooring shall have a coefficient of friction of at least 0.6 per ASTM D2047.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver tiles and installation accessories to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

- B. Store flooring materials in dry spaces protected from the weather with ambient temperatures maintained between 50-deg. F. and 90-deg. F.
- C. Store tiles on flat surfaces. Move tiles and installation accessories into spaces where they will be installed at least 48-hours in advance of installation.

1.06 PROJECT CONDITIONS

- A. Maintain a minimum temperature of 70-deg. F. in spaces to receive tiles for at least 48-hours prior to installation, during installation, and for not less than 48-hours after installation. After this period, maintain a temperature of not less than 55-deg. F.
- B. Do not install tiles until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during tile installation.
- D. Provide for continuous ventilation during installation using as close to 100-percent outside air as possible.

1.07 SEQUENCING AND SCHEDULING

- A. Install tiles and accessories after other finishing operations, including painting, have been completed.
- B. Do not install tiles over concrete slabs until the slabs have cured and are sufficiently dry to bond with adhesive as determined by tile manufacturer's recommended bond and moisture test.

1.08 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.
 - 1. Furnish not less than one box for each 50 boxes or fraction thereof, of each class, wearing surface, color, pattern and size of resilient floor tile installed.

PART 2 - PRODUCTS

2.01 RESILIENT TILE FLOORING

- A. Luxury Vinyl Tile: As indicated on the Drawings or as selected by the Architect.

2.02 INSTALLATION ACCESSORIES

- A. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- B. Trowelable Underlayment and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by tile manufacturer for applications indicated.
- C. Adhesives: Manufacturer's recommended VOC-compliant adhesive. Adhesive shall be warranted for up to 8.0-lbs of moisture vapor emission of concrete per 1,000-sq. ft. per 24-hours. Adhesive shall be moisture-resistant, mildew-resistant and antimicrobial.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas where installation of tiles will occur, with Installer present, to verify that substrates and conditions are satisfactory for tile installation and comply with tile manufacturer's requirements and those specified in this Section.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by tile manufacturer.
 - 2. Finishes of subfloors comply with tolerances and other requirements specified in Section 03 30 00 for slabs receiving resilient flooring.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits of any kind.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. General: Comply with manufacturer's installation specifications to prepare substrates indicated to receive tile.
- B. Use trowelable leveling and patching compounds per tile manufacturer's directions to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.
- D. Broom or vacuum clean substrates to be covered by tiles immediately before tile installation. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.
- E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.
- F. Test concrete slabs to receive resilient tile flooring for moisture levels in accordance with manufacturer's instructions.

3.03 INSTALLATION

- A. General: Comply with tile manufacturer's installation directions and other requirements indicated that are applicable to each type of tile installation included in Project.
- B. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths at perimeter that equal less than one-half of a tile. Install tiles square with room axis, unless otherwise indicated.
- C. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles with grain running in one direction unless otherwise indicated or directed by the Architect.
- E. Scribe, cut, and fit tiles to butt tightly to vertical surfaces, permanent fixtures, built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosing.
- F. Extend tiles into toe spaces, door reveals, closets, and similar openings.
- G. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent marking device.
- H. Adhere tiles to flooring substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed tile installation.
- I. Use full spread of adhesive applied to substrate in compliance with tile manufacturer's directions including those for trowel notching, adhesive mixing, and adhesive open and working times.
- J. Hand roll tiles where required by tile manufacturer.

3.04 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing tile installation:
 1. Remove visible adhesive and other surface blemishes using cleaner recommended by tile manufacturers.
 2. Sweep or vacuum floor thoroughly.
 3. Do not wash floor until after period recommended by resilient floor tile manufacturer.
 4. Damp-mop tile to remove black marks and soil.
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended by tile manufacturer.
 1. Cover tiles with undyed, untreated building paper until inspection for Acceptance of Work.
 2. Do not move heavy and sharp objects directly over tiles. Place plywood or hardboard panels over tiles and under objects while they are being moved. Slide or roll objects over panels without moving panels.
- C. Clean tiles not more than 4-days prior to dates scheduled for final acceptance. Clean tiles using method recommended by manufacturer.

END OF SECTION

SECTION 09 72 00

WALL COVERINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing wall coverings.
- B. Related Sections:
 - 1. Gypsum board is specified in Section 09 29 00.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's technical data and installation instructions for each type of wall covering and installation materials.
 - 1. Furnish MSDS or manufacturer's data indicating VOC content of adhesive.
- B. Samples: Full width samples of each type of wall covering, showing range of color and pattern variation; submit sets of sample moldings.
- C. Certification: Manufacturer's certification that materials furnished comply with requirements specified.
- D. Maintenance Instructions: Manufacturer's printed instructions for maintenance, including precautions for use of cleaning materials which could damage wall covering.
- E. Extra Materials: After completion of work, deliver to Project site not less than 6-linear yards of each type, color, and pattern of wall covering installed. Furnish replacement materials from same production run as materials installed.
- F. Warranty.

1.03 QUALITY ASSURANCE

- A. Manufacturer: Each type of wall covering shall be produced by a single manufacturer, including recommended primers, adhesives, and sealants.
- B. Installer: A firm specializing in wall covering work with not less than 3-years of experience installing wall coverings like those required for this Project.
- C. Fire Hazard Classification: Provide materials bearing UL, Warnock Hersey or other label and marking, indicating fire hazard classification of wall covering, as determined by ASTM E84.
 - 1. Provide materials with flame spread not more than 25, and smoke developed not more than 50.
- D. Test Panels: Install 3-test panels of full usable width for each type of wall covering to be installed, including one corner, in areas designated by Architect. Replace test panels which are not acceptable to Architect until satisfactory installation is achieved.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturers' instructions and recommendations.

- B. Deliver materials to Project site in original packages or containers clearly labeled to identify manufacturer, brand name, quality or grade, and fire hazard classification.
- C. Store materials in original undamaged packages or containers. Do not store rolled goods in upright position.

1.05 JOB CONDITIONS

- A. Maintain constant minimum temperature of 60-deg. F. at areas of installation for at least 72-hours before and 48-hours after application of materials.
- B. Illuminate areas of installation using building's permanent lighting system; temporary lighting will not be acceptable.

1.06 WARRANTY

- A. Wall covering materials, when adhered to a sound surface shall be free of manufacturing defects for a period of 5-years. Manufacturing defects include permanent surface staining attributable to mildew and/or bleed-through of foreign impurities embedded in the backing, and separation of the vinyl from its backing. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 WALL COVERINGS

- A. As indicated on the Drawings or as selected by the Architect.

2.02 ACCESSORY ITEMS

- A. Adhesives: Manufacturer's recommended Low VOC adhesive, primer, and clear sealer, for use with selected wall covering on indicated substrate. Provide materials that are mildew-resistant and non-staining to wall covering.
- B. Release Coat: Water base sealer or enamel undercoater for substrates as recommended by wall covering manufacturer.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Acclimatize wall covering materials by removing from packaging in area of installation not less than 24-hours before application.
- B. Remove switch plates, wall plates, and surface-mounted fixtures in areas where wall covering is to be applied.
- C. Prime and seal substrates in accordance with wall covering manufacturer's recommendations. Apply surface sealer to gypsum board to permit subsequent removal of wall covering without damage to paper facing.
- D. Test substrate with electronic moisture water to verify that surfaces to be covered do not exceed 4-percent moisture content.

3.02 INSTALLATION

- A. Place wall covering panels consecutively in order cut from rolls, including filling of spaces above or below openings. Hang by reversing alternate strips except on match patterns.

- B. Apply adhesive to back of wall covering and place in accordance with manufacturer's instructions. Install seams plumb, and at least 6-inches away from corners. Horizontal seams are not permitted. Overlap seams and double-cut to assure tight closure. Roll, brush, or use broad knife to remove air bubbles, wrinkles, blisters, and other defects; cut wall covering evenly to edges of wall penetrations.
- C. Trim selvages as required to assure color uniformity and pattern match.
- D. Remove excess adhesive along finished seams while it is still wet using materials and procedures recommended by wall covering manufacturer.

3.03 ADJUST AND CLEAN

- A. Replace removed plates and fixtures; verify cut edges of wall coverings are completely concealed.
- B. Remove surplus materials, rubbish, and debris resulting from wall covering installation, and leave areas of installation in neat, clean condition.

END OF SECTION

SECTION 09 81 00
ACOUSTIC INSULATION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing acoustic insulation.
- B. Related Sections:
 - 1. Thermal insulation is specified in Section 07 21 00.
 - 2. Firestopping is specified in Section 07 84 00.
 - 3. Acoustical joint sealants are specified in Section 07 92 19.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's specifications for each type of insulation required.

1.03 QUALITY ASSURANCE

- A. Fire Ratings: Comply with fire-resistance and flammability ratings specified.
- B. Fiberglass-based acoustic insulation shall be Greenguard Gold Certified.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation from physical damage and from becoming wet or soiled. Comply with manufacturer's recommendations for handling, storage, and protection during installation.

1.05 INDOOR AIR QUALITY

- A. Protect ducts and HVAC system from loose insulation particulates.
- B. Provide temporary ventilation of building areas where building insulation is being installed.

PART 2 - PRODUCTS

2.01 ACOUSTIC BATT/BLANKET INSULATION

- A. Formaldehyde-Free Unfaced Mineral/Glass Fiber Blanket/Batt Acoustical Insulation: Acoustical insulation produced by combining glass fibers with formaldehyde-free thermosetting resins to comply with ASTM C665, Type I.
 - 1. Surface Burning Characteristics: Maximum flame-spread and smoke developed values of 25 and 50 when tested in accordance with ASTM E84.
 - 2. Approved Manufacturers: Johns Manville "Formaldehyde-Free Sound Control Fiber Glass Batts", CertainTeed "NoiseReducer Sound Attenuation and Acoustical Ceiling Batts" or approved equal.
 - 3. Thickness: As indicated.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with manufacturer's instructions for installation conditions.
- B. Do not install insulation until building is sufficiently enclosed or protected against absorption of moisture by the insulation, and do not install insulation unless supporting framing and construction is in a thoroughly dry condition.
- C. Install snugly between framing members with ends snugly fitted between units and against adjacent construction.
- D. Carefully cut and fit insulation around pipes, conduit, and other obstructions and penetrations.
- E. Where door and window frames occur in framing, cut additional strips of insulation and hand-pack as required to fill voids in and around such frames.

3.02 PROTECTION

- A. Protect installed insulation from harmful exposures and from physical damage.

END OF SECTION

SECTION 09 91 00

PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for painting and finishing of interior and exterior exposed items and surfaces.
1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatments specified in other Sections.
 2. Work includes painting exposed pipes and ducts, hangers, exposed steel and iron, and primed metal surfaces of Mechanical and Electrical equipment, and general sheet metal work, except as otherwise indicated or specified.
 3. Work includes painting hardware specified as primed (USP or 600).
 4. Work includes sanding shop-primed surfaces and applying specified primer and finish coats.
 5. "Paint" means coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- B. Surfaces Not to Be Painted:
1. Pre-finished items, including but not limited to acoustic materials, casework, and finished mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.
 2. Concealed surfaces such as walls or ceilings in concealed areas and inaccessible areas, furred areas, pipe spaces, and duct shafts.
 3. Finished metal surfaces such as anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials, exterior aluminum entrances, storefronts, windows, and fabrications.
 4. Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor, and fan shafts.
- C. Following categories of work are included under other Sections:
1. Shop priming ferrous metal items including structural steel, metal fabrications, hollow metal work and similar items. The work of this Section includes sanding and applying specified primer on all shop-primed surfaces exposed to view in the completed work.
 2. Shop priming of fabricated components such as architectural woodwork, wood casework and shop-fabricated or factory-built mechanical and electrical equipment or accessories.
 3. Piping identification is specified in Division 22 and 23.
- D. Do not paint over code-required labels, equipment identification, performance rating, name, or nomenclature plates.

1.02 SUBMITTALS

- A. Certification: Furnish certification by the paint manufacturer that products supplied comply with local regulations controlling the use of volatile organic compounds (VOCs). Include VOC content of all paint products.
- B. Samples: Furnish samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.
 - 1. Provide stepped samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture is achieved.
 - 2. Furnish samples on the following substrates for review of color and texture only:
 - a. Painted Wood: Two 12-inch square samples of each color and material on hardboard.
 - b. Stained or Natural Wood: Two 4-inch x 8-inch samples of natural and stained wood finish on actual wood samples.
- C. Product Data: Specified paint systems are those of Benjamin Moore, Dunn Edwards, Kelly Moore, Sherwin Williams, and Vista. If other paint manufacturers are proposed and accepted by the Architect, furnish product comparison charts showing that proposed paint systems are equal to the specified materials in number of coats, type of paint, and sheen.

1.03 QUALITY ASSURANCE

- A. VOC content of interior paints shall not exceed 5 g/L.
- B. Applicators Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent.
- C. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use thinners approved by paint manufacturer and use within recommended limits.
- D. Coordination of Work: Review other Sections in which prime paints are to be provided to ensure compatibility of coatings system for various substrates. Upon request, furnish information or characteristics of finish materials to be used.
- E. Requirements of Regulatory Agencies: Comply with applicable rules and regulations of governing agencies for air quality control.
 - 1. Comply with current applicable regulations of the local air quality district, California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).
 - 2. Regulatory changes may affect the formulation, availability, or use of specified coatings. Confirm availability of coatings to be used prior to start of painting.
- F. Field Samples: On interior and exterior wall surfaces provide full-coat finish samples on at least 100-sq. ft. of surface, as directed, until required sheen, color and texture is obtained; simulate finished lighting conditions for review of in-place work. Approved samples will be used as a standard for the Project.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new, and unopened packages and containers bearing manufacturer's name, batch number, color, and directions.

- B. Store materials in tightly covered containers. Maintain containers in a clean condition, free of foreign materials and residue.
- C. Keep storage area neat and orderly. Remove oily rags and waste daily. Ensure that workers and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

1.05 JOB CONDITIONS

- A. Apply water-base paints when temperature of surfaces to be painted and surrounding air temperatures are between 50-deg. F. and 90-deg. F., unless otherwise permitted by paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45-deg. F. and 90-deg. F., unless otherwise permitted by paint manufacturer's printed instructions.
- C. Do not apply paint in rain, fog, or mist, when relative humidity exceeds 85-percent, or when temperature is less than 5-deg. F. above dew point, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
- D. Provide adequate ventilation during interior painting using as close to 100-percent outside air as possible.

1.06 EXTRA MATERIALS

- A. In addition to materials for completion of the work, furnish 1-gallon of additional materials for each type and color of opaque paint used.
- B. Furnish extra materials from same production lots or color runs used in the work. Furnish in containers factory sealed and labeled. Identify each container with Project name and type of material.
- C. Deliver materials and an inventory list just prior to Substantial Completion and store where directed by Owner.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. Benjamin Moore, Dunn Edwards, Kelly Moore, Sherwin Williams, Vista or approved equal.

2.02 MATERIALS

- A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application.
- B. Material Quality: Provide best quality grade of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable. Each product within any one paint system shall be from the same manufacturer.

2.03 COLORS AND SHEENS

- A. Paint Colors and Sheens: As indicated on the Drawings or as directed by the Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions under which painting is to be applied. Surfaces receiving paint shall be thoroughly dry before paint is applied.
 - 1. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify Architect prior to applying barrier coats.
 - 2. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning.
 - 3. Start of painting will be construed as the applicator's acceptance of surfaces and conditions within a particular area.

3.02 PROTECTION

- A. Protection: Protect work of other Sections against damage by painting and finishing work. Correct damage by cleaning, repairing, or replacing, and repainting, as acceptable to Architect.
 - 1. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
 - 2. Remove or protect hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted or provide surface-applied protection prior to surface preparation and painting. Following completion of painting, reinstall removed items.
 - 3. At completion of work of other Sections, touch-up and restore damaged or defaced painted surfaces.

3.03 SURFACE PREPARATION

- A. Concrete and Masonry:
 - 1. Prepare surfaces to be painted by removing surface contaminates.
 - a. Remove efflorescence with stiff bristle brush, wire brushing, wiping, sandblasting or acid washing and rinsing. Allow to dry.
 - b. Remove chalk, dust, dirt, asphalt, tar or excessive mortar by scraping or wire brushing.
 - c. Remove rust, grease or oil by solvent cleaning or sandblasting.
 - d. Treat concrete surfaces which are highly glazed or where traces of form release agents are present with a preparation of one-part concentrated muriatic acid, 4-parts water and one-part detergent or as recommended by parting compound manufacturer. Remove acid with water. Allow to dry.
 - e. Remove stains on concrete resulting from weathering or corroded metals, with a solution of 2-oz. sodium methasilicate in one-gallon water. Wet stained areas with water before application of solution. Allow to dry.
- B. Plaster:
 - 1. Clean surfaces free from grit, loose plaster, and surface irregularities.

2. Determine alkalinity and moisture content by performing appropriate tests. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's literature or where pH exceeds 10.
- C. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
1. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dry.
 2. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
 3. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
- D. Ferrous Metal: Clean ungalvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of The Society for Protective Coatings (SSPC).
1. Blast surfaces clean as recommended by the paint system manufacturer and according to requirements of SSPC specification SSPC-SP 10.
 2. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 3. Sand shop-applied prime coats to a smooth surface, ready to receive specified primer and finish coats.
- E. Galvanized Metals:
1. Clean galvanized metal with an appropriate metal prep and passivator remover.
 2. Perform the following test to ensure passivator removal:
 - a. With a 5-percent copper sulfate solution, place a swab or droplets on the prepared area. If the copper sulfate causes the galvanized coating to blacken, passivator has been removed and the surface is ready for paint application.
 - b. If the copper sulfate has no effect on the galvanized coating, continue with metal prep solution, prepared in accordance with SSPC-SP 16 "Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals" or use a scotch pad to abrade it, being careful not to remove the galvanizing.
 3. Document the process and successful passivator removal with photographs.
 4. Prepare weathered galvanized metals that have developed a layer of white rust by wire brushing or scrubbing with a stiff brush or abrasive pad to remove the white rust.
- F. Gypsum Board: Clean surfaces of dust, dirt, grease, oil and other foreign matter and dust clean.
- G. Existing Surfaces to be Repainted: Thoroughly clean and de-gloss surfaces to be repainted by sanding or other means prior to painting. Patched and bare areas shall be shop-primed with same alkyd primer as specified for new work.

3.04 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density and stir as required during application. Do not stir surface film into material. Remove film and strain material before using.
- D. Use thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.05 APPLICATION

- A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
 - 1. Provide finish coats compatible with prime coats.
 - 2. The number of coats required is the same regardless of the application method. Do not apply following coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where required to produce a smooth even surface.
 - 3. Apply additional coats when undercoats, stains or other conditions show through final coat, until paint film is of uniform finish, color and appearance. Edges, corners, crevices, welds, and exposed fasteners shall receive a dry film thickness equivalent to that of flat surfaces.
 - 4. Paint surfaces behind movable equipment and furniture.
 - 5. Paint surfaces behind permanently-fixed equipment or furniture with prime coat before final installation of equipment.
 - 6. Paint visible surfaces of ducts where visible through registers or grilles with a flat, non-specular black paint.
 - 7. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.
 - 8. Finish doors on top, bottom, and side edges same as faces. Where openings into rooms have different finishes, finish door edges as directed by the Architect.
 - 9. Omit primer on metal surfaces that have been shop-primed and touch-up painted, unless otherwise indicated.
- B. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation.
 - 1. Allow sufficient time between successive coatings to permit proper drying.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's instructions.
 - 1. Brushes: Use brushes best suited for the material applied.

2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- D. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate.
- E. Mechanical and Electrical Work: Painting mechanical and electrical work is limited to items exposed in mechanical equipment rooms and in occupied spaces. Finish to match adjoining wall or ceiling surfaces.
 1. Mechanical items to be painted include, but are not limited to, piping, hangers, and supports; heat exchangers; tanks; ductwork; insulation; supports; motors and mechanical equipment; air grilles and diffusers; and accessory items.
 2. Electrical items to be painted include, but are not limited to conduit and fittings, panels, and switchgear.
- F. Block Filler: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled flush, free of pinholes. Provide multiple coats if required.
- G. Prime Coats: Before applying finish coats, apply a prime coat. Re-coat primed and sealed surfaces where there is evidence of suction spots or unsealed areas to assure a finish coat with no burn-through or other defects.
- H. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.
- I. Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
- J. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

3.06 CLEANING

- A. Clean-Up: During progress of work, remove discarded paint materials, rubbish, cans and rags at end of each workday.
- B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by washing and scraping; do not scratch or damage finished surfaces.

3.07 EXTERIOR PAINT SCHEDULE

	BENJAMIN MOORE	DUNN- EDWARDS	KELLY- MOORE	SHERWIN WILLIAMS	VISTA	MPI CATEGORY
A. Ferrous Metal, 100% Acrylic Semigloss						
First Coat	Ultra Spec UP04	BRPR00 Series Bloc- Rust	5725 DTM Acrylic Primer/Finish	ProCryl B66- 310 Acrylic Primer	9600 Protec Metal Primer	107
Second Coat	Ultra Spec 449	SSHL50 Spartashield SG	1215 Premium Professional	A-100 A8 Semigloss	7000 Acriglo Semi Gloss	11

				SG			
	Third Coat	Ultra Spec 449	SSHL50 Spartashield SG	1215 Premium Professional SG	A-100 A8	7000 Acriglo Semi Gloss	11
B. Galvanized and Zinc Alloy Metal, 100% Acrylic Semigloss							
	Pretreatment	Etch	ME-01 Krud Kutter Metal Clean & Etch	Krud Kutter Metal Clean & Etch	B71Y1 DTM Wash Primer	Krud Kutter Metal Etch	
	First Coat	Fresh Start Acrylic Primer #023	ULGM00 Ultrashield Galvanized Metal Primer	5725 DTM Acrylic Primer/Finish	ProCryl B66-310Primer	4800 Metal Pro Primer	134
	Second Coat	Ultra Spec 449	SSHL50 Spartashield SG	1215 Premium Professional SG	A-100 A8 Semigloss	7000 Acriglo Semi Gloss	11
	Third Coat	Ultra Spec 449	SSHL50 Spartashield SG	1215 Premium Professional SG	A-100 A8 Semigloss	7000 Acriglo Semi Gloss	11
C. Concrete, 100% Acrylic Flat							
	First Coat	Fresh Start Acrylic Primer N023	ESPR00 Eff-Stop Premium Primer	247 Acry-Shield	A24W300 Loxon Primer	4600 Uniprime II	3
	Second and Third Coats	Ultra Spec N447	SSHL10 Spartashield Flat	1200 Premium Professional Flat	A-100 A6 Flat	2200 Coverall Flat	10
D. Concrete Block, 100% Acrylic Flat							
	First Coat	Ultra Spec 0571	SBSL00 Smooth Blocfil Select	521 Premium Professional Filler	B25W25 Prep Rite Block Filler	040 Acrylic Block Filler	4
	Second and Third Coats	Ultra Spec 447	SSHL10 Spartashield Flat	1200 Premium Professional Flat	A-100 A6 Flat	2200 Coverall Flat	10
E. Wood, 100% Acrylic Semigloss							
	First Coat	Fresh Start Acrylic Primer N023	EZPR00 EZ-Prime Premium	255 Acry-Shield	B42W81 Exterior Latex Primer	4200 Terminator II	6
	Second and Third Coats	Ultra Spec 449	SSHL50 Spartashield SG	1215 Premium Professional SG	A-100 A8 Semigloss	7000 Acriglo Semi Gloss	11
F. Wood, Acrylic Semi-Transparent Stain							
	First and Second Coats	Aborcoat N638	ZIN-OK 700 Series Okon Weather Pro	1285 Acry-Shield	A15T5 WoodScapes	Monopole Aquaseal Stain	156

3.08 INTERIOR PAINT SCHEDULE

	BENJAMIN MOORE	DUNN-EDWARDS	KELLY-MOORE	SHERWIN WILLIAMS	VISTA	MPI CATEGORY
A. Wood, 100% Acrylic Low Odor/Zero VOC Semigloss						
First Coat	Fresh Start 0217	UGSL00 Ultra-Grip Select	973 Acry-Plex	ProMar 200 Zero B28-200 Primer	5001 V-Pro Primer	46
Second and Third Coats	Ultra Spec N539	SZRO50 Spartazero Semi-Gloss	1050 Premium Professional SG	ProMar 200 Zero B31-2600 Semi-Gloss	5400 V-Pro Semi Gloss	---

B. Wood, Clear Satin Urethane Finish							
	First Coat	Lenmar Sealer 1PR.100	Defthane Polyurethane Gloss	Old Masters Masters Armor Satin	A68V91 Wood Classics WB Polyurethane Varnish GL	Defthane Polyurethane Gloss	---
	Second and Third Coats	Lenmar Aqua Plastic 1WB.1427	Defthane Polyurethane Satin	Old Masters Masters Armor Satin	A68 Wood Classics WB Polyurethane Varnish SG	Defthane Polyurethane Satin	128
C. Wood, Stain and Satin Urethane Finish							
	First Coat	Lenmar 1 WB Wiping Stain	Old Masters Wiping Stain	Old Masters Wiping Stain	Minwax 250 Oil Stain	Old Masters Wiping Stain	90
	Second Coat	Lenmar Sealer 1PR.100	Old Masters Water-Based Sanding Sealer	Old Masters Water – Based Sanding Sealer	A68V91 Wood Classics WB Polyurethane Varnish GL	Old Masters Water-Based Sanding Sealer	---
	Third and Fourth Coats	Lenmar Aqua Plastic 1WB.1427	Old Masters Water-Based Polyurethane Satin	Old Masters Masters Armor Satin	A68 Wood Classics WB Polyurethane Varnish SG	Old Masters Water-Based Polyurethane Satin	128
D. Concrete, Acrylic Low Odor/Zero VOC Flat							
	First Coat	Ultra Spec N534	Ultra-Grip Select UGSL00	971 Acry-Plex	ProMar 200 Zero B28-2600 Primer	5001 V-Pro Primer	50
	Second and Third Coats	Ultra Spec N536	SZRO10 Spartazero Flat	1005 Premium Professional Flat	ProMar 200 Zero B30w2600 Flat	5100 V-Pro Flat	143
E. Concrete, 100% Acrylic Low Odor/Zero VOC Low Sheen/Eggshell							
	First Coat	Ultra Spec N534	UGSL00 Ultra-Grip Select	971 Acry-Plex	ProMar 200 Zero B28w2600 Primer	5001 V-Pro Primer	50
	Second and Third Coats	Ultra Spec N538	SZRO30 Spartazero Eggshell	1010 Premium Professional Eggshell	ProMar 200 Zero B20w2651 Eggshell	5300 V-Pro Eggshell	145
F. Concrete, 100% Acrylic Low Odor/Zero VOC Semigloss							
	First Coat	Ultra Spec N534	SBSL00 Smooth Blocfil Select	971 Acry-Plex	ProMar 200 Zero B28-2600 Primer	5001 V-Pro Primer	50
	Second and Third Coats	Ultra Spec N540	SZRO50 Spartazero Semi-Gloss	1050 Premium Professional Semi-Gloss	HP Acrylic B66w651 Semi-Gloss	5400 V-Pro Semi Gloss	147
G. Concrete Block, Acrylic Low Odor/Zero VOC Flat							
	First Coat	Ultra Spec 0571	SBSL00 Smooth Blocfil Select	521 Premium Professional Filler	B25W25 PrepRite Block Filler	040 Acrylic Block Filler	4
	Second and Third Coats	Ultra Spec N536	SZRO10 Spartazero Flat	1005 Premium Professional Flat	ProMar 200 Zero B30w2600 Flat	5100 V-Pro Flat	143
H. Concrete Block, 100% Acrylic Low Odor/Zero VOC Semigloss							
	First Coat	Ultra Spec 0571	SBSL00 Smooth Blocfil Select	521 Premium Professional Filler	B25W25 PrepRite Block Filler	040 Acrylic Block Filler	4
	Second and Third Coats	Ultra Spec N540p	SZRO50 Spartazero	1050 Premium	HP Acrylic B66w651	5400 V-Pro Semi Gloss	147

			Semi-Gloss	Professional Semi-Gloss	Semi-Gloss		
I. Gypsum Board, Acrylic Low Odor/Zero VOC Flat							
	First Coat	Ultra Spec N534	VNSL00 Vinylastic Select	971 Acry-Plex	ProMar 200 Zero B28w2600 Primer	5100 V-Pro Flat	149
	Second and Third Coats	Ultra Spec N536	SZRO10 Spartazero Flat	1005 Premium Professional Flat	ProMar 200 Zero B30w2600 Flat	5100 V-Pro Flat	143
J. Gypsum Board, 100% Acrylic Low Odor/Zero VOC Low Sheen/Eggshell							
	First Coat	Ultra Spec N534	VNSL00 Vinylastic Select	971 Acry-Plex	ProMar 200 Zero B28w2600 Primer	5001 V-Pro Primer	149
	Second and Third Coats	Ultra Spec N538	SZRO30 Spartazero Eggshell	1010 Premium Professional Eggshell	ProMar 200 Zero B28- 2651 Eggshell	5300 V-Pro Eggshell	145
K. Gypsum Board, 100% Acrylic Low Odor/Zero VOC Semigloss							
	First Coat	Ultra Spec N534	VNSL00 Vinylastic Select	971 Acry-Plex	ProMar 200 Zero B28w2600 Primer	5001 V-Pro Primer	149
	Second and Third Coats	Ultra Spec N540	SZRO50 Spartazero Semi-Gloss	1050 Premium Professional SG	HP Acrylic B66w651 Semi-Gloss	5400 V-Pro Semi Gloss	147
L. Ferrous Metal, 100% Acrylic Low Odor/Zero VOC Semigloss							
	First Coat	Ultra Spec HP04	BRPR00 Series Bloc-Rust	5725 DTM Acrylic Primer/Finish	ProCryl B66- 310 Acrylic Primer	9600 Protec Metal Primer	107
	Second and Third Coats	Ultra Spec N540	SZRO50 Spartazero Semi-Gloss	1050 Premium Professional SG	Pro Industrial Acrylic B66w651 Semi-Gloss	7000 Acriglo Semi Gloss	147
M. Non-Ferrous Metal, 100% Acrylic Low Odor/Zero VOC Semigloss							
	Pretreatment	Etch	ME-01 Krud Kutter Metal Clean & Etch	Krud Kutter Metal Etch	B71Y1 Wash Primer	Krud Kutter Metal Etch	
	First Coat	Ultra Spec HP04	ULGM00 Ultrasield Galvanized Metal Primer	5725 DTM Acrylic Primer/Finish	ProCryl B66- 310 Acrylic Primer	4800 Metal Pro Primer	107
	Second and Third Coats	Ultra Spec N540	SZRO50 Spartazero Semi-Gloss	1050 Premium Professional SG	HP Acrylic B66w651 Semi-Gloss	7000 Acriglo Semi Gloss	147

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing the following types signs:
 - 1. Dimensional letters and numbers.
 - 2. Accessibility entrance signs.
 - 3. Toilet room entry signs.
 - 4. Room identification signs.
 - 5. Area of refuge signs.
 - 6. International symbol of accessibility.
 - 7. Additional signage indicated on the Drawings.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's construction details relative to materials, dimensions of individual components, profiles, and finishes for each type of sign required.
- B. Shop Drawings: Furnish shop drawings for fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, reinforcement, accessories, layout, and installation details.
 - 1. Furnish message list for each sign required, including large scale details of wording and layout of lettering.
 - 2. For signs supported by or anchored to permanent construction, furnish setting drawings, templates, and directions for installation of anchor bolts and other anchors.
 - 3. Furnish full-size spacing templates for individually mounted dimensional letters and numbers.
- C. Samples: Furnish samples of each exposed material, including letters and other graphics, showing finish, color, and qualities of fabrication and design.

1.03 QUALITY ASSURANCE

- A. Comply with California Building Code (CBC) Section 11B-703.

PART 2 - PRODUCTS

2.01 MATERIALS AND FABRICATION

- A. Acrylic Sheet: Transparent, clear, semi-matte or non-glare, thickness specified.
- B. Aluminum Sheet: Alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated and specified.

- C. Aluminum Extrusions: Alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated and specified.
- D. Cast Aluminum: Aluminum Association Alloy C443.2.
- E. Stainless Steel Plate, Sheet, and Strip: Provide stainless steel plate, sheet, or strip, AISI Type 302, complying with ASTM A167.
- F. Colored Coatings for Acrylic Plastic Sheet: Use colored coatings, including inks and paints for copy and background colors that are recommended by acrylic manufacturer for optimum adherence to acrylic surface and are non-fading for the application intended.
- G. Interior Signage:
 - 1. Signs shall be sign manufacturer's standard one-piece photopolymer sign face with tactile Braille and letters or acrylic sign face with applied tactile lettering and Braille, at manufacturer's option, and shall be interior rated.
 - 2. Sign materials and fabrication shall comply with applicable CBC and ADA signage requirements.
 - 3. Sign design, materials, and colors as directed by the Architect.
 - 4. Sign Finish: Eggshell, matte, or non-glare as selected by the Architect.
 - 5. Copy: 5/8-inch minimum, 2-inch maximum as recommended by sign manufacturer for required copy, raised minimum 1/32-inch.
 - 6. Letters: San Serif, style as indicated or as selected by the Architect.
 - 7. Braille: Contracted Grade 2 Braille complying with CBC Section 11B-703.3.
 - 8. Mounting: Tamper-resistant mechanical fasteners.

2.02 SIGN SUMMARY

- A. Metal Letters and Numbers:
 - 1. Provide characters with smooth, flat surfaces, sharp corners, and precisely formed lines and profiles, free from pits, scale, sand holes, or other defects. Cast lugs into back of characters and tap to receive threaded mounting studs.
 - 2. Material and Finish: As selected by the Architect.
- B. Entrance Signs:
 - 1. All building entrances that are accessible to and useable by physically disabled persons shall be identified with at least one standard accessibility symbol sign and with additional directional signs as required, to be visible to persons along approaching pedestrian ways.
 - 2. Comply with CBC Section 11B-216.6.
- C. Toilet Room Entry Signs:
 - 1. Provide geometric symbols as follows. Material and colors as indicated or as selected by the Architect.
 - a. Men: 12-inch equilateral triangle with international symbol for men.

- b. Women: 12-inch diameter circle with international symbol for women.
 - c. Gender Neutral: 12-inch diameter circle with 12-inch equilateral triangle.
 - d. Comply with CBC Section 11B-703.7.2.6 and ADA Article 4.30.
 - 2. Provide sign with raised letters and Braille on the wall adjacent to the latch outside the door. Where there is no wall space on the latch side and at double leaf doors, provide sign on nearest adjacent wall. Comply with CBC Section 11B-703.4.2.
 - 3. Center geometric symbols on door and signs on wall at a height of 60-inches above finished floor.
- D. Room Identification Signs:
- 1. Provide one sign adjacent to latch side of doors or on the nearest adjacent wall where indicated. Signs shall identify room name as directed by the Architect.
 - 2. Provide signs with raised upper case letters with Grade 2 Braille. Comply with ADA Article 4.30.
 - 3. Mount signs 60-inches above finish floor to centerline of sign.
 - 4. Comply with CBC Section 11B-703.4.2.
- E. Area of Refuge Signs:
- 1. Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign complying with CBC Section 1107.9 stating AREA OF REFUGE and shall include the International Symbol of Accessibility. Where exit sign illumination is required, the area of refuge sign shall be illuminated. Tactile signage complying with CBC Section 11B-703 shall be located at each door to an area of refuge. Comply with CBC Section 1007.6.5.
 - 2. At exits and elevators serving a required accessible space but not providing an approved accessible means of egress, provide signs indicating the location of accessible means of egress. Comply with CBC Section 1007.7.
 - 3. Provide a sign adjoining the two-way communication system with instructions on the use of the area under emergency conditions. Comply with CBC Section 1007.6.4.
- F. International Symbol of Accessibility:
- 1. Design: As indicated in CBC Section 11B-703.7.2.1.
 - 2. Color: White figure on a blue background. Blue color equal to Color No. 15090 in Federal Standard 595B.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Locate where indicated and as required by applicable codes and secure with specified fasteners.
- B. Install level, plumb and at height indicated or required, with surfaces free from distortion or other appearance defects.

- C. Dimensional Letters and Numbers: Mount letters and numbers using standard fastening methods recommended by manufacturer. Provide template to establish letter spacing and to locate holes for fasteners.

- 1. Mount letters with backs in contact with wall surface or projected from the wall surface as indicated.

3.02 CLEANING AND PROTECTION

- A. At completion of installation, clean soiled surfaces in accordance with manufacturer's instructions. Protect units from damage until final acceptance.

END OF SECTION

SECTION 10 21 13

TOILET COMPARTMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes overhead braced plastic laminate faced toilet compartments and screens.
- B. Related Sections:
 - 1. Toilet accessories are specified in Section 10 28 13.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's technical data for materials, fabrication, and installation, include catalog cuts of anchors, hardware, fastenings, and accessories. Include manufacturer's recommended maintenance data.
- B. Shop Drawings: Include plans, elevations, sections, details and attachments to other work.
 - 1. Show locations of cutouts for compartment-mounted toilet accessories.
 - 2. Show locations of reinforcements for compartment-mounted grab bars.
- C. Samples: Full range of color samples for each type of unit required. Furnish 12-inch square samples of each color and finish on same substrate to be used in the work, for color verification after selections have been made.

1.03 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E84 or Egyptian equivalent, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: Comply with California Building Code (CBC) and Americans with Disabilities Act (ADA) requirements.

1.04 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements prior to preparation of Shop Drawings and fabrication where possible. Allow for adjustments within specified tolerances wherever taking field measurements before fabrication might delay the work.
- B. Coordination: Furnish inserts and anchorages to be built into other work; coordinate delivery to avoid delay.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. Ironwood Manufacturing Co. or approved equal.

2.02 PLASTIC LAMINATE FACED TOILET COMPARTMENTS

- A. Plastic Laminate: High-pressure plastic laminate 0.039-inch thick bonded under pressure with an environmentally friendly PVA-type adhesive to 45-pound, industrial-grade particleboard. Plastic laminate color as indicated on the Drawings or as selected by the Architect.
- B. Handrail Braced Style: Partition attached to floor and stabilized at the top of the pilaster with anti-grip headrail.
- C. Doors and Panels: Louvered doors and panels constructed with stile and rail construction, using wood veneer with engineered or industrial grade particleboard core. Louvered doors and panels are 1.25-inch thick. Non-louvered panels are 7/8-inch thick.
- D. Pilasters: Plastic laminate faced, 1-1/4-inch thick. Provide 22-gauge stainless steel shoes.
- E. Headrail: Extruded, clear, anodized aluminum with anti-grip profile.
- F. Hardware: Cast stainless steel in brushed silver finish.
 - 1. Door Hardware: Hinges are surface mount and strikes/keepers are wraparound style. Slide latches, coat hooks, and bumpers are surface mounted. Door pulls are through bolted. Fasteners are tamper proof.
 - 2. Brackets: Stirrup type one ear, two ear, and u brackets with theft-resistant fasteners.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's recommended procedures and installation sequence.
 - 2. Install compartments rigid, straight, plumb, and level.
 - 3. Secure units in position with manufacturer's recommended anchoring devices.
 - 4. Provide clearances of not more than 1/2-inch between pilasters and panels, and not more than 1-inch between panels and walls.
 - 5. Secure panels to walls with not less than two stirrup brackets attached near top and bottom of panel.
 - a. Locate wall brackets so that holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.

B. Overhead-Braced Supported Units:

1. Secure pilasters to supporting construction and level, plumb, and tighten.
2. Hang doors and adjust so doors are level and aligned with panels when doors are in closed position.

C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.02 ADJUST AND CLEAN

A. Hardware Adjustment:

1. Adjust and lubricate hardware for proper operation.
2. Set hinges on in-swinging doors to hold doors open approximately 30-degrees from closed position when unlatched.
3. Set hinges on out-swinging doors and entrance swing doors to return to fully closed position.

B. Clean exposed surfaces of partitions using materials and methods recommended by manufacturer. Protect as required to prevent damage until final acceptance.

END OF SECTION

SECTION 10 28 13

TOILET ACCESSORIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing toilet accessories.
- B. Related Sections:
 - 1. Rough carpentry is specified in Section 06 10 00.
 - 2. Joint sealants are specified in Section 07 92 00.
 - 3. Non-structural metal framing is specified in Section 09 22 16.
 - 4. Gypsum board is specified in Section 09 29 00.
 - 5. Tile is specified in Section 09 30 00.
 - 6. Toilet compartments are specified in Section 10 21 13.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's product data and installation instructions for each toilet accessory.
- B. Setting Drawings: Furnish setting drawings, templates, instructions, and directions for installation of anchorage devices and cut-out requirements in other work.
- C. Warranty.

1.03 QUALITY ASSURANCE

- A. Toilet tissue dispensers shall be continuous flow type. Dispensers that control delivery are not acceptable.
- B. Toilet accessories shall not have manufacturer's name and/or logo exposed to view when installed.

1.04 REGULATORY REQUIREMENTS

- A. Accessibility: Conform to the more restrictive provisions of the American with Disabilities Act or California Building Code (CBC).

1.05 PROJECT CONDITIONS

- A. Coordinate accessory locations, installation, and sequencing with other work to avoid interference and to assure proper installation, operation, adjustment, cleaning, and servicing.
- B. Ensure wall studs and backing plates are installed as required.

1.06 WARRANTY

- A. Furnish manufacturer's written 5-year warranty against silver spoilage of mirrors, agreeing to replace any mirrors that develop visible defects within warranty period. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

- A. Stainless Steel: AISI 18-8 Type 304, with No. 4 finish.
- B. Mirror Glass: Clear tempered float glass with silvering, electro-plated copper coating, and protective coating.
- C. Fasteners: Concealed screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed. Exposed face fasteners are not acceptable.
- D. Keys: Unless otherwise directed by the Owner, provide universal keys for access to toilet accessory units requiring internal access for servicing. Provide a minimum of six keys.

2.02 TOILET ACCESSORY ITEMS

- A. As indicated in the Restroom Accessory Schedule on the Drawings.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Check wall openings for correct dimensions, plumbness of blocking or frames, and other preparation that would affect installation of accessories.
- B. Check areas to receive surface mounted units for conditions that would affect quality and execution of work.
- C. Verify spacing of plumbing fixtures that affect installation of accessories.

3.02 INSTALLATION

- A. Install toilet accessory units in accordance with manufacturer's instructions, using tamper-proof fasteners. Finish of exposed fasteners shall match accessory item secured. Install units plumb and level, firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamper-proof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, in accordance with manufacturer's instructions for type of substrate involved.
- C. Fit flanges of accessories snug to wall surfaces. Install sanitary sealant in gaps between 90-degree return flanges and finish wall surface after installation.
- D. Finish edges of accessories with sealant to avoid water penetration.

3.03 ADJUSTING AND CLEANING

- A. Adjust accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish exposed surfaces of accessories in accordance with manufacturer's recommendations after removing temporary labels and protective coatings.

END OF SECTION

SECTION 10 41 16

EMERGENCY KEY CABINETS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing emergency key cabinets.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's descriptive and technical data and installation details.

1.03 QUALITY ASSURANCE

- A. Coordinate ordering lock boxes with the local Fire Department.

PART 2 - PRODUCTS

2.01 EMERGENCY KEY CABINETS

- A. Approved Manufacturer: Knox Company "KnoxVault" Model 4430 or approved equal.
- B. Housing: 1/4-inch plate steel.
- C. Door: 5/8-inch solid steel with interior gasket and stainless-steel hinge.
- D. Lock: UL-listed, double-action rotating tumblers and hardened steel pins.
- E. Size: 9-1/2-inches high x 9-1/2-inches wide.
- F. Mounting: Recessed.
- G. Color: Powder coat finish in color as selected by Architect from manufacturer's standards.

PART 3- EXECUTION

3.01 INSTALLATION

- A. Install emergency key cabinets at locations indicated or required by authorities having jurisdiction in accordance with manufacturer's instructions.
- B. Securely fasten in place with sides plumb and level.
- C. Exposed surfaces shall be free from scratches, tool marks, and other damage and defects.

END OF SECTION

SECTION 10 44 00

FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing the following:

1. Fire extinguishers.
2. Fire extinguisher cabinets.

1.02 SUBMITTALS

- A. Product Data: Furnish for each type of product specified. For fire extinguisher cabinets, include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.
- B. Samples: Furnish samples of each type of metal finish required, prepared on metal of same thickness, and allow to be used in the final work. Where finishes involve normal color and texture variation, include sample sets showing full range of variations expected.

1.03 QUALITY ASSURANCE

- A. Obtain fire extinguishers and cabinets from one source from a single manufacturer.
- B. UL-Listed Products: Provide fire extinguishers which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher specified.
- C. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

1.04 COORDINATION

- A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers are accommodated.
- B. Coordinate sizes and locations of fire protection cabinets with wall depths.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Cold-Rolled Steel: ASTM A1008, Commercial Steel (CS), Type B.
- B. Tempered Float Glass: ASTM C1048, Kind FT, Condition A, Type I, Quality q3, 1/4-inch thick, Class 1 (clear).

2.02 FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated. Comply with requirements of governing authorities. Fire extinguishers shall be full charged and tagged in accordance with requirements of the authority having jurisdiction.
- B. Multi-Purpose Dry Chemical Type: UL-rated 2A:10BC, 5-lb. nominal capacity, in enameled steel container.

2.03 FIRE EXTINGUISHER CABINETS

- A. Approved Manufacturers: J.L. Industries, Larsen's Manufacturing Co., Potter-Roemer, Inc. or approved equal.
- B. Tub: Heavy-gauge, white baked enamel.
 - 1. Where fire extinguisher cabinets are installed in fire-rated partitions, provide cabinet walls fabricated from 0.0428-inch thick, cold-rolled steel sheet lined with minimum 5/8-inch-thick fire-barrier material. Provide factory-drilled mounting holes.
- C. Cabinet Type:
 - 1. Concrete and Concrete Block Walls: Surface-mounted.
 - 2. Other Walls and Partitions: Fully recessed.
- D. Trim Style: Exposed trim, either square-edge or rolled-edge as standard with manufacturer for cabinet type and depth.
- E. Door Material: Manufacturer's standard enameled steel.
- F. Door Glazing: Clear tempered float glass.
- G. Door Style: Vertical Duo Panel with J.L. Industries SAF-T-LOK or approved equal cylinder lock with plastic cam for emergency access, narrow vertical glazing full height of door with pull handle.
- H. Door Hardware: Manufacturer's standard door operating hardware for cabinet type, trim style, and door material and style specified. Provide concealed or continuous type hinge permitting door to open 180-deg.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install items in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
- B. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim in compliance with manufacturer's instructions.
- C. Securely fasten fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.

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TWINSTEPS architecture
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END OF SECTION

SECTION 12 36 40

STONE COUNTERTOPS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing stone counter tops, splashes, and surrounds where indicated.
- B. Related Sections:
 - 1. Architectural wood casework is specified in Section 06 41 00.
 - 2. Joint sealants are specified in Section 07 92 00.

1.02 SUBMITTALS

- A. Shop Drawings: Furnish cutting and setting drawings showing sizes, dimensions, sections, profiles and provisions for jointing and other details. Dimensions shall be based on field measurements.
- B. Samples:
 - 1. Stone: Minimum four 12-inch x 12-inch x full thickness of each type of stone required with edges finished as indicated, sealed with proposed sealer. Where required, furnish range of samples showing the range of exposed color and texture to be expected in the completed work.
 - 2. Grout: Grout samples for verification of selected colors.

1.03 QUALITY ASSURANCE

- A. Obtain stone from quarry with consistent color range and texture throughout the work.
- B. Stone fabricator shall have minimum 5-years experience fabricating stone of the type required for this Project.
- C. Stone counter tops shall comply with applicable provisions of the Marble Institute of America (MIA).

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Handle material to prevent chipping, breakage, soiling or other damage.
- B. Protect edges of materials with wood or other rigid materials.
- C. Lift with wide belt type slings wherever possible; if required, use wood rollers and provide cushion at end of wood slides.

- D. Store stone on wood skids and pallets. Place and stack skids and units to distribute weight evenly and to prevent breakage or cracking. Protect stored stone from weather with waterproof, non-staining covers or enclosures allowing air to circulate around units.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Stone: As indicated in the Finish Schedule on the Drawings, minimum 2 cm (13/16-inch) thick unless otherwise indicated.
- B. Grout: Latex-portland cement grout, custom color selected by the Architect.
- C. Provide anchors, dowels, cramps, and other devices required for anchorage of stone.
- D. Sealer: Penetrating sealer as recommended by stone supplier, to prevent staining from citric acid and alcohol.
- E. Adhesives, Grout, and Sealants: Adhesive and joint filler materials shall be inconspicuous and shall match the adjacent surface for smoothness.
 - 1. Water-Cleanable Epoxy Adhesive: VOC compliant, complying with ANSI A118.3.
 - 2. Stone Adhesive: VOC compliant 2-part epoxy or polyester adhesive, formulated specifically for bonding stone to stone, with an initial set time of not more than 2-hours at 70-deg. F.
 - 3. Sealant: As specified in Section 07 92 00.

2.02 FABRICATION

- A. Verify dimensions by field measurements before preparation of shop drawings and fabrication of stone.
- B. Coordinate fabrication schedule to avoid delay of work.
- C. Fabricate stone counter tops as indicated on reviewed shop drawings and in compliance with the recommendations of the Marble Institute of America (MIA).
- D. Thickness of stone material used throughout the Project shall not vary more than 1/8-inch.
- E. Provide holes and sinkages cut or drilled for anchors, fasteners and supports as required to secure counter tops and splashes in place.
- F. Cut and back check as required for proper fit and clearance.
- G. Edge overhangs shall be consistent and ½- to 1-1/4-inch over the outer most cabinet face and finished end, and parallel with the cabinet face of end within +/- 1/8-inch in any 8'-0" run. Countertop ends at appliances shall be flush with cabinets to a maximum of ¼-inch over the cabinet end.

- H. Cut stone to size and dimensions indicated on reviewed shop drawings. Comply with fabrication tolerances of MIA. Dress joints straight and at 90-degree angle to face unless otherwise indicated.

- 1. Cutouts shall be within +/- 1/8-inch of locations and +1/8-inch to 0-inch for size.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Site Verification:
 - 1. Verify that substrates supporting quartz surfaces are plumb, level, and flat to within 1/16-inch in 10-feet and that necessary supports and blocking are in place.
 - 2. Base cabinets shall be securely fixed to adjoining units and back wall.
- B. Inspect finished surfaces for damage. Do not install until damage materials have been repaired in an acceptable manner or replaced.

3.02 PREPARATION

- A. Protect finished surfaces against scratches. Apply masking where required. Guard against grit, dust, and damage from other work.

3.03 INSTALLATION

- A. Do not use pieces with chips, cracks, voids, discoloration or other defects which might be visible or cause staining in finished work.
- B. Install stone with skilled installers; make necessary field cuts as required.
- C. Set stone in accordance with reviewed shop drawings. Provide anchors, supports, fasteners and other attachments necessary to secure stone in place.
- D. Shim and adjust as required for a level installation.
- E. Install stone with butted joints. Maintain minimum grout lines.
- F. Install stone countertops on neoprene setting blocks where recommended by fabricator or installer.
- G. Bottom of countertop build-up and subtop or front rail shall be flush within 1/16-inch, free of glue residue, and sanded or filled smooth with edges eased at knee spaces or cantilevers. Built-up members shall be of the same material as the countertop.
- H. Finish exposed edges to remove sharp edges.
- I. Cantilevers with or without sub-top shall not exceed 6-inches for 2 cm (13/16-inch) thick stone or 10-inches for 3 cm (1-3/16-inch) thick stone.
- J. Scribe stone countertops to abutting vertical surfaces with uniform 1/8-inch-wide joints filled with color matched joint sealant.

3.04 CLEANING AND PROTECTION

- A. Remove and replace stone pieces that are broken, chipped, stained or otherwise damaged. Provide new units where directed and install in a manner to eliminate evidence of replacement.
- B. Clean stone after installing; use procedures by stone fabricator.
- C. Provide protective covering where required.

END OF SECTION