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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Project information.
   2. Work covered by Contract Documents.
   3. Work under separate contracts.
   4. Owner-furnished/Contractor-installed (OFCI) products.
   5. Contractor’s use of site and premises.
   6. Coordination with occupants.
   7. Work restrictions.
   8. Correlation and intent.

B. Related Requirements:
   1. Section 01 5000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: Roseland Library Tenant Improvements.

B. Project Location:
   470 Sebastopol Rd.
   Santa Rosa, California

C. Owner: Sonoma County Library, a California Joint Powers Authority Entity.

D. Architect: Anderson Brule Architects
   325 South First Street, 4th Floor
   San Jose, California 95113
1.4 WORK COVERED BY CONTRACT DOCUMENTS

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

1. Conversion of existing occupancy M (retail) to an occupancy “A3” (Library) to include a renovation/tenant improvement of an existing 4,295 NSF/4,445 GSF Commercial Retail building, wood framed (Type V, 1998 CBC), including selective demolition, new restroom, interior painting and finishes, new casework, flooring, ceiling, fire sprinklers, electrical power and lighting upgrades, mechanical and plumbing improvements, minor site (accessible path of travel) work and landscaping improvements Type of Contract:

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

C. The Work of the Contract includes but is not necessarily limited to:

2. Modernization of existing buildings, including associated civil, architectural, structural, plumbing, mechanical and/or electrical work as indicated; including new finishes, adaptive re-use and modification, accessibility modernization, adding or modifying HVAC, changing and expanding selected infrastructure utilities and other associated modifications.
3. Construction phasing and barricading of work areas as required to separate construction areas from occupied spaces and as needed to accommodate the Owner’s schedule and use of the site.
4. All other work as shown in the Contract Documents.

D. The Work includes all labor, materials and equipment necessary for the Contractor to fulfill all of its obligations pursuant to the Contract Documents, including but not limited to:

1. Home office overhead,
2. Off-Site supervision,
3. Project Administration including preparation, research and distribution of project correspondence and submittals,
4. Schedule preparation and maintenance,
5. Guarantees and warranties,
6. On-Site supervision,
7. Temporary protection,
8. Temporary utilities and facilities, including mobilization and demobilization,
9. Material handling and storage,
10. Safety equipment,
11. Travel time to and from the Site to the Contractor’s home office.

E. Sequence the Work subject to the Owner’s use of the site, the requirements of the Construction Phasing, Technical Specifications and the Contract provisions for Time of Completion found elsewhere in these documents.

F. Provide materials and perform work indicated or required to produce finished results shown.

G. Contractor shall coordinate all work and shall be responsible for division of work among the various subcontractors.

1. Coordinate the work of this Contract with the activities of the Owner, local agencies and serving utilities.
2. Coordinate the work of this Contract with the activities of the Owner’s separate contractors, including those for removal or abatement of Hazardous Materials (if applicable).

H. Laws, Codes and Regulations: Intent of the Contract Documents is to construct the Work shown therein, in accordance with applicable laws, codes and regulations.

1.5 OWNER-FURNISHED/CONTRACTOR-INSTALLED (OFCI) PRODUCTS

A. Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:
   1. Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.
   2. Provide for delivery of Owner-furnished products to Project site.
   3. Upon delivery, inspect, with Contractor present, delivered items.
      a. If Owner-furnished products are damaged, defective, or missing, arrange for replacement.
   4. Obtain manufacturer's inspections, service, and warranties.
   5. Inform Contractor of earliest available delivery date for Owner-furnished products.

B. Contractor's Responsibilities: The Work includes the following, as applicable:
   1. Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.
   2. Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.
   3. Receive, unload, handle, store, protect, and install Owner-furnished products.
   4. Make building services connections for Owner-furnished products.
   5. Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Completion.
   6. Repair or replace Owner-furnished products damaged following receipt.

C. Owner-Furnished/Contractor-Installed (OFCI) Products: As indicated on Drawings.

1.6 CONTRACTOR'S USE OF SITE AND PREMISES

A. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Driveways, Walkways, and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.
E. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to area approved by the Architect. If additional storage is necessary, Contractor shall obtain and pay for such storage off site without additional expense to the Owner.
   1. Move stored products, temporary facilities, controls or fencing, under Contractor's control, which interfere with operations of the Owner or separate contractors, on or off the site, without cost to the Owner.
   2. Do not overload structures with weight that will endanger them.

F. Assume full responsibility for protection and safekeeping of materials and tools stored at the site. Lock vehicles such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

G. Perform site access activities, including arrival and departure of workers, deliveries, storing, handling and removal of materials, equipment, and debris to minimize dust, mud or accumulated debris, or undue interference with the convenience, sanitation or routine of Owner's activities.

H. Time and coordinate cutovers and connection of new utilities to existing systems and other similar activities to avoid interference with or interruption of Owner's activities.

I. Protect existing finished work remaining in place from damage due to construction activities. Repair and replace finished work damaged by activities of this contract to match adjacent undamaged work to the satisfaction of Owner and Architect at no extra cost to the Owner.
   1. Protect improvements on adjoining properties as well as those on the Owner's property.
   2. Restore all improvements damaged by this work to their original condition as acceptable to the owner of the improvement

J. Assume responsibility for safety and support of structures. Cease operations and notify Architect immediately if safety of structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored. Assume liability for such movement, settlement, damage or injury.

K. Provide, erect and maintain barricades and guard rails as required by governing regulatory agencies to protect occupants of building and workers. Refer to other pertinent sections of Division 01.

1.7 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

SUMMARY OF WORK

01 1100 - 4
1.8 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
   1. Notify Owner not less than two days in advance of proposed utility interruptions.
   2. Obtain Owner's written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
   1. Notify Owner not less than two days in advance of proposed disruptive operations.
   2. Obtain Owner's written permission before proceeding with disruptive operations.

E. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances on Owner's property is not permitted.

F. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
   1. Maintain list of approved screened personnel with Owner's representative.

1.9 CORRELATION AND INTENT

A. Correlation and Intent: Contract Documents are Complementary and Inclusive.
   1. The Contract Documents are complementary and are intended to include all items required for the proper execution and completion of the Work.
   2. All items of work mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be provided by Contractor as if shown or mentioned in both.

B. Coverage of the Drawings and Specifications:
   1. The Drawings and Specifications generally describe the work to be performed by Contractor. Generally, the Specifications describe work which cannot be readily indicated on the Drawings and indicate types, qualities, and methods of installation of the various materials and equipment required for the Work.
   2. It is not intended to mention every item of Work in the Specifications, which can be adequately shown on the Drawings, or to show on the Drawings all items of Work described or required by the Specifications even if they are of such nature that they could have been shown.
C. Provide all materials or labor for Work, which is shown on either by the Drawings or the Specifications (or is reasonably inferable as necessary to complete the Work), whether or not the Work is expressly covered in either the Drawings and/or the Specifications.

D. Work is intended to be of sound, quality construction. Include adequate amounts to cover installation of all items indicated, described, or implied in Contract Documents.

E. Conflicts. In the event there is a discrepancy between the various Contract Documents, the Owner/Contractor Agreement shall control. Without limiting Contractor’s obligation to identify conflicts for resolution by the Architect identified elsewhere in this Article it is intended that the more stringent, higher quality, and greater quantity of Work shall apply.

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

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

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

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.

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

4. Titles. The Specifications are separated into titled sections for convenience only and not to dictate or determine the trade or craft involved.

5. As Shown, Etc. Where "as shown," "as indicated," "as detailed," or words of similar import are used, reference is made to the Drawings accompanying the Specifications unless otherwise stated. Where "as directed," "as required," "as permitted," "as authorized," "as accepted," "as selected," or words of similar import are used, the direction, requirement, permission, authorization, approval, acceptance, or selection by Architect is intended unless otherwise stated.

6. Provide. "Provide" means "provided complete in place," that is, furnished, installed, tested, and ready for operation and use.

7. General Conditions. The General Conditions and supplementary general conditions are a part of each and every section of the Specifications.

8. Abbreviations.
   a. In the interest of brevity, the Specifications are generally written in an abbreviated form in the imperative tense and may not include complete sentences.
   b. Omission of words or phrases such as "Contractor shall," "shall be," etc., are intentional. Nevertheless, the requirements of the Specifications are mandatory and directed to the Contractor.
   c. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.

9. Plural. Words in the singular shall include the plural whenever applicable or the context so indicates.

10. Metric. The Documents may indicate metric units of measurement as a supplement to U.S. customary units. When indicated thus: 1 inch (25 mm), the U. S. customary unit is specific, and the metric unit is nonspecific. When not shown with parentheses, the unit is specific. The metric units correspond to the "International System of Units" (SI) and generally follow ASTM E 380, "Standard for Metric Practice."

11. Reference Standard Specifications. All references to standard specifications of a society, institute, association, or governmental authority is a reference to the organization's reference standard specifications, which are in effect at the date of the Contractor's proposal, or effective date as required by governing codes.
   a. If applicable specifications are revised prior to completion of any part of the Work, the Contractor may, if acceptable to Architect, perform such Work in accordance with the revised specifications.
   b. The standard specifications, except as modified in the Specifications for the Project, shall have full force and effect as though printed in the Specifications. Architect will
furnish, upon request, information as to how copies of the standard specifications referred to may be obtained.

c. Procurement of reference standards and standard specifications is the sole responsibility of the Contractor.

12. Absence of Modifiers. In the interest of brevity, the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another shall not affect the interpretation of either statement.

B. Rules of Document Interpretation

1. In the event of conflict or ambiguity within the drawings, the following rules shall apply:
   a. General Notes, when identified as such, shall be incorporated into other portions of Drawings.
   b. Schedules, when identified as such, are complementary with other notes and other portions of Drawings including those identified as General Notes.
   c. Larger scale drawings shall take precedence over smaller scale drawings.
   d. General or Typical Details and Symbols apply at all locations where specifically noted; at all locations conforming to the title of the Detail; at all locations of similar or identical graphic indication; at all locations where similar conditions are not fully or specifically shown or identified and complement similar details of specific conditions.
   e. Details and Notes apply at all locations of similar or identical graphic indications and at all locations where similar conditions are not fully or specifically shown or identified.
   f. Limitation of Indication does not affect Extent of Application: Indications of notes, details, and symbols may be limited to promote clarity. No limitation of application is intended nor shall be construed unless specifically noted.

2. Figured, derived, or numerical dimensions shall govern. At no time shall the Contractor base construction on scaled drawings.

3. Specifications shall govern as to materials, workmanship, and installation procedures.

4. In the case of disagreement or conflict between or within standards, specifications, and drawings, the more stringent, higher quality, and greater quantity of Work shall apply.

C. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

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

E. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
   1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
   2. Abbreviations: Materials and products on Drawings may be identified by abbreviations scheduled on Drawings.
   3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers or terminology found in this Project Manual.
4. The Drawings, General provisions of the Contact, including General and Supplementary Conditions and other Division 01 specifications apply to the Work of all specifications sections as if specifically reproduced therein.

1.11 EXISTING CONDITIONS

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

1.12 CONTRACT COMPLETION

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

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. The Architect-Engineer, if requested, will provide the General Contractor with a one-time electronic copy of the Contract Document Drawings limited to Plan sheets and Exterior Building Elevations for distribution to subcontractors and suppliers. Release of other sheets will be at the sole discretion of the Architect.

1. The Architect nor its’ consultants assume any liability for such usage of these electronic files.

B. The electronic copy will be provided via electronic file transfer in AutoCad 2014 format, or later.

1.3 REFERENCES

A. A copy of the Agreement is included at the end of this Section.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.1 EXECUTION

A. Contractor shall provide signed agreement to the Architect prior to receiving delivery of the electronic drawing files.

- END OF SECTION -
THIS SHEET IS INTENTIONALLY BLANK
AN AGREEMENT BETWEEN ARCHITECT / ENGINEER OF RECORD AND CONTRACTOR
FOR TRANSFER OF COMPUTER AIDED DRAFTING (CAD) FILES ON ELECTRONIC MEDIA

Architect / Engineer of Record (AER) ______________________________________________

Contractor _________________________________________________________________

Address: _____________________________________________________________________

Date: _______________________________________________________________________

Project Name: __________________________________________________________________

Location: ______________________________________________________________________

The AER will provide the following CAD files, dated ______________, for the convenience of
the contractor in preparing shop fabrication drawings:

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

Drawings were prepared on the following:

Computer Software: _____ AUTOCAD ____________ Version: _____ Rel2014

Contract Document Drawings provided are limited to Plan sheets and Exterior Building
Elevations. Sheets will be released at the sole discretion of the AER.

TERMS AND CONDITIONS:

1. AER makes no representation as to the compatibility of the CAD files with any hardware or
   software.

2. Since the information set forth on the CAD files can be modified unintentionally or
   otherwise, the AER reserves the right to remove all indicia of its ownership and/or
   involvement from each electronic display. This media should not be considered a certified
document.

3. All information on the CAD files is considered instruments of service of the AER and shall
   not be used for other projects, for additions to this project, or completion of this project by
   others. CAD files shall remain the property of the AER, and in no case shall the transfer of
   these files be considered a sale.
4. AER makes no representation regarding the accuracy, completeness, or permanence of CAD files, nor for their merchantability or fitness for a particular purpose. Addenda information or revisions made after the date indicated on the CAD files may not have been incorporated. In the event of a conflict between the AER’s sealed Contract Drawings and CAD files, the sealed Contract Drawings shall govern. It is the Contractor’s responsibility to determine if any conflicts exist. The CAD files shall not be considered to be Contract Documents as defined by the General Provisions of the Contract for Construction.

5. The use of CAD files prepared by the AER shall not in any way obviate the Contractor’s responsibility for the proper checking and coordination of dimensions, details, member sizes and gage, and quantities of materials as required to facilitate complete and accurate fabrication and erection.

6. The Contractor shall, to the fullest extent permitted by law, indemnify, defend and hold harmless the AER, and its sub-consultants from all claims, damages, losses, expenses, penalties and liabilities of any kind, including attorney’s fees, arising out of or resulting from the use of the CAD files by the Contractor, or by third party recipients of the CAD files from the Contractor.

7. The AER believes that no licensing or copyright fees are due to others on account of the transfer of the CAD files, but to the extent any are, the Contractor will pay the appropriate fees and hold the AER harmless from such claims.

8. Any purchase order number provided by the Contractor is for Contractor’s accounting purposes only. Purchase order terms and conditions are void and are not a part of this Agreement.

9. Payment of the service fee is due upon receipt of the CAD files.

10. This Agreement shall be governed by the laws of the principal place of business of the AER.

**AUTHORIZED ACCEPTANCE**

by Architect / Engineer of Record

by Contractor

Signature

Signature

Print Name and Title

Print Name and Title

Date

Date
- SECTION 01 2500 -

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:
1. Section 01 6000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS
A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS
A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.


2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
   a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.

c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

e. Samples, where applicable or requested.

f. Certificates and qualification data, where applicable or requested.

g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.

j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

k. Cost information, including a proposal of change, if any, in the Contract Sum.

l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

n. Written certification by the proposer that the Substitution is equal or better in every respect to that required by the contract Documents and that substitution will perform adequately in the application intended.

o. Written certification that the proposer will pay for all permits, fees, and costs required to implement the substitution, and including waiver of all claims for additional costs or time extension which may subsequently become apparent, and reimbursement of Owner and Architect for review or redesign services associated with re-approval by authorities.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.


b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.
1.5 QUALITY ASSURANCE

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

1.6 PROCEDURES

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

1.7 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
   1. Conditions of Consideration: Architect will consider requests for substitution for cause only when one or more of the following conditions are met and documented:
      a. Specified item fails to comply with regulatory requirement.
      b. Specified item is no longer manufactured.
      c. Specified item, through no fault of the Contractor, unavailable in the time frame required to meet project schedule.
      d. Specified item, through subsequent information disclosure, will not perform properly or fit in designated space.
      e. Manufacturer declares specified product to be unsuitable for use intended or refuses to warrant installation of product,
      f. Substitution would be, in the sole judgment of the Architect, a substantial benefit to the Owner in terms of cost, time, energy conservation, or other consideration of merit.
   2. Conditions of Review: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
      a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
      b. Substitution request is fully documented and properly submitted.
      c. Requested substitution will not adversely affect Contractor's construction schedule.
      d. Requested substitution has received necessary approvals of authorities having jurisdiction.
      e. Requested substitution is compatible with other portions of the Work.
      f. Requested substitution has been coordinated with other portions of the Work.
      g. Requested substitution provides specified warranty.
      h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Architect will consider requests for substitution if received within 35 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions of Review: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
   a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
   b. Requested substitution does not require extensive revisions to the Contract Documents.
   c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   d. Substitution request is fully documented and properly submitted.
   e. Requested substitution will not adversely affect Contractor's construction schedule.
   f. Requested substitution has received necessary approvals of authorities having jurisdiction.
   g. Requested substitution is compatible with other portions of the Work.
   h. Requested substitution has been coordinated with other portions of the Work.
   i. Requested substitution provides specified warranty.
   j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 LIMITATIONS ON SUBSTITUTIONS SUBMITTED PRIOR TO THE RECEIPT OF BIDS
   A. Architect will consider requests for substitutions of specified equipment and/or materials only when requests are received by Architect within fourteen (14) days prior to the date established for the receipt of bids.
   B. Architect will consider a substitution request only if request is made in strict conformance with provisions of this Section. Request shall be fully responsive to all product requirements of the specified product, including those requirements noted in this section in the article titled PRODUCTS.
   C. Burden of proof of merit of requested substitution is the responsibility of the proposer requesting the substitution.
   D. It is the sole responsibility of the proposer requesting the substitution to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.
   E. When substitution is not accepted, provide specified product.
   F. Substitute products shall not be included within the bid without written acceptance by Addendum.
G. No material changes permitted after the bid opening date. All alternate manufacturers and/or materials shall be submitted and approved in writing by the Architect prior to bid due date, except as otherwise provided in this section. Failure to comply with this requirement is grounds for disqualification of substitution.

3.2 LIMITATIONS ON SUBSTITUTIONS SUBMITTED AFTER THE AWARD OF THE CONTRACT

A. The Contract is based upon the standards of quality established by those items of equipment and/or materials which are indicated in the Contract Documents.

B. Notwithstanding other provisions of this section and the above, the Architect may consider a request for substitution after the date of the receipt of bids or contract award, if in the sole discretion of the Architect, there appears to be just cause for such a request. The acceptance of such a late request does not waive any other specified requirement.

C. Architect will consider a request for substitution only if request is made in strict conformance with provisions of this section. Request shall be fully responsive to all product requirements of the specified product, including those requirements noted in related section 01 6000.

D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

E. Review of submittals does not constitute acceptance of substitutions indicated or implied on submittals.

F. Substitutions will not be considered when requested or submitted directly by subcontractor or supplier.

G. Contractor’s failure or inability to pursue the work promptly or coordinate activities properly shall not establish a cause for consideration of Substitutions.

H. Burden of proof of merit of requested substitution is the responsibility of the Contractor.

I. It is the sole responsibility of the Contractor to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.

J. When substitution is not accepted, provide specified product.

K. Substitute products shall not be provided without written acceptance by Change Order.

3.3 SUBSTITUTION PROCEDURES

A. Instructions to Bidders and General Conditions of the Contract may specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements in related documents and procedures specified in this section.

B. Do not request substitutions after expiration of specified periods.

C. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
   1. All Performance Requirements listed in Articles titled QUALITY ASSURANCE, DESIGN CRITERIA, PERFORMANCE REQUIREMENTS and WARRANTY must be met and provided with the Request for Substitution.
   2. All Salient Physical Attributes must be met and documented with the Request For Substitution.
   3. Document each request on Architect’s Request for Substitution (RFS) form with complete data substantiating compliance of proposed substitution with Contract Documents. All requests for substitution must be submitted on the specified form which may be obtained from the Architect. Requests received without the Request Form will be rejected.

E. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives all claims for additional costs or time extension which may subsequently become apparent.
   5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

F. Regulatory Requirements: Proposer requesting the substitution shall be responsible for obtaining all regulatory approvals required for proposed substitutions.

G. All regulatory approval shall be obtained for proposed substitutions prior to submittal of substitution request to Architect.

H. All costs incurred by the Owner in obtaining regulatory approvals for proposed substitutions, including the costs of the Architect and any authority having jurisdiction over the project shall be reimbursed to the Owner. Costs of these services shall be reimbursed regardless of final acceptance or rejection of substitution.

I. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

3.4 ARCHITECT’S REVIEW OF SUBSTITUTIONS

A. The Architect will accept or reject proposed substitutions within fourteen (14) days of receipt of request.

B. If a decision on a substitution cannot be made within the time allocated, the specified product shall be used.

C. No extension of bid period or contract time will be made for substitution review.

D. Final acceptance of a substitution submitted prior to the date established for the receipt of bids will be in the form of an Addendum.
E. Final acceptance of a substitution submitted after the award of the contract will be in the form of a Change Order.

F. Architect/Engineer shall be the judge of the acceptability of the proposed substitution. Architect’s decision on substitution requests is final and does not require documentation or justification.

G. Rejection of Substitution Request: Any of the following reasons shall be cause for rejection, all as determined by the Architect;
   1. Vagueness or incompleteness of Substitution submittal,
   2. Insufficient data, failure to meet specified requirements (including warranty).
   3. Qualification of the requirements of the Substitution Form, including modification of any of the requirements.

H. The Architect/Engineer will notify Contractor in writing of decision to accept, accept as noted, or not accept the request for substitution.

I. Substitute products shall not be ordered or installed without written acceptance.

J. Owner shall receive full benefit of any cost reduction as a result of any request for substitution.

K. Provide submittals for accepted substitutions in accordance with specified requirements of the respective section and provisions of Section 01 3300.

L. An accepted substitution is not acceptable as a submittal. Provide separate submittals for each review.

- - END OF SECTION -
MATERIALS OR PRODUCT SUBSTITUTION REQUEST

To: ___________________________  Project: ______________________

Specified Item: __________________________________________________________

Section No.: __________  Page No. __________  Paragraph No. ______________________

Description: _______________________________________________________________________

Reason for Request: ☐ Substitution for Cause, or  ☐ Substitution for Convenience

The undersigned requests consideration of the following Proposed Substitution: _______________

The attached data include product description, specifications, drawings, photographs, performance and test data required for evaluation of request; applicable portions of data are clearly identified.

Additionally, attached data include a description of changes to Contract Documents which proposed substitution will require for its proper installation. The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be readily available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item, as fully documented with this request.

Contractor waives all claims for additional cost or time arising from this Substitution.

Submitted by:
Signature: ______________________________
Contractor: _____________________________
Address: _______________________________
Date: ___________  Phone # ___________
Attachments: ___________________________

For Use by Architect:
[ ] Returned Without Action.
[ ] Accepted.  [ ] Not Accepted.
[ ] Accepted as noted.  [ ] Received too late.
By: ____________________________________
Date: ____________________________________
Remarks: __________________________________

Address: _______________________________
_______________________________________
_______________________________________
_______________________________________
_______________________________________
PART 1 - GENERAL

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

1.2 SUMMARY
   A. Section includes administrative and procedural requirements for handling and processing
      Contract modifications.
   B. Related Requirements:
      1. Section 01 2500 "Substitution Procedures" for administrative procedures for handling
         requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK
   A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving
      adjustment to the Contract Sum or the Contract Time, on form provided by the Architect.

1.4 PROPOSAL REQUESTS
   A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed
      changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If
      necessary, the description will include supplemental or revised Drawings and Specifications.
      1. Work Change Proposal Requests issued by Architect are not instructions either to stop
         work in progress or to execute the proposed change.
      2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after
         receipt of Proposal Request, submit a quotation estimating cost adjustments to the
         Contract Sum and the Contract Time necessary to execute the change.
         a. Include a list of quantities of products required or eliminated and unit costs, with total
            amount of purchases and credits to be made. If requested, furnish survey data to
            substantiate quantities.
         b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade
            discounts.
         c. Include costs of labor and supervision directly attributable to the change.
d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
e. Quotation Form: Use forms provided by Owner. Sample copies are included in Project Manual.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
   1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
   2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
   3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   4. Include costs of labor and supervision directly attributable to the change.
   5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
   6. Comply with requirements in Section 01 2500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
   7. Proposal Request Form: Use form provided by Owner. Sample copy is included in Project Manual.

1.5 CHANGE ORDER PROCEDURES


1.6 CONSTRUCTION CHANGE DIRECTIVE

   1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
   1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.7 ACCORD AND SATISFACTION

A. Every Change Order shall constitute a full accord and satisfaction, and release, of all Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or
relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay, and any other type of claim. Contractor may elect to reserve its rights to disputed claims arising from or relating to the changed Work at the time it signs a Change Order, but must do so expressly in writing delivered concurrently with the executed Change Order, and must also submit a Claim for the reserved disputed items pursuant to Article 12 of Document 007200 (General Conditions) no later than 30 Days of Contractor's first written notice of its intent to reserve rights.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

3.1 FORMS

A. Attached to the end of this Section are the following forms for the Contractors use.
SAMPLE ONLY

COST BREAKDOWN FORM FOR CONTRACT MODIFICATION

One separate form shall be used by Contractor, each first tier subcontractor and each lower tier subcontractor. One form for each shall be used for each change order. One form for each, for each day shall be used for Force-Account work.
## COST BREAKDOWN FOR CONTRACTOR PRICE PROPOSAL

### GENERAL CONTRACTOR FORM

**PROJECT NUMBER:**

**PROJECT NAME:**

**CONTRACTOR:**

**CHANGE ORDER NUMBER:**

**DATE:**

### CHANGE ORDER DESCRIPTION:

**SUMMARY OF TOTAL COSTS**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>TOTAL LABOR COSTS</td>
<td>$ -</td>
</tr>
<tr>
<td>2.</td>
<td>Ten percent (10%) of Line 1</td>
<td>$ -</td>
</tr>
<tr>
<td>3.</td>
<td>Sum of Lines 1 &amp; 2</td>
<td>$ -</td>
</tr>
<tr>
<td>4.</td>
<td>TOTAL MATERIAL COSTS</td>
<td>$ -</td>
</tr>
<tr>
<td>5.</td>
<td>Ten percent (10%) of Line 4</td>
<td>$ -</td>
</tr>
<tr>
<td>6.</td>
<td>Sum of Lines 5 &amp; 6</td>
<td>$ -</td>
</tr>
<tr>
<td>7.</td>
<td>TOTAL EQUIPMENT RENTAL COSTS</td>
<td>$ -</td>
</tr>
<tr>
<td>8.</td>
<td>Ten percent (10%) of line 7</td>
<td>$ -</td>
</tr>
<tr>
<td>9.</td>
<td>Sum of lines 7 &amp; 8</td>
<td>$ -</td>
</tr>
<tr>
<td>10.</td>
<td>TOTAL OF SUBCONTRACTED COST</td>
<td>$ -</td>
</tr>
<tr>
<td>11.</td>
<td>Five percent (5%) of line 10</td>
<td>$ -</td>
</tr>
<tr>
<td>12.</td>
<td>Sum of Lines 10 &amp; 11</td>
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### SUBTOTAL OF DIRECT COSTS & MARK-UP

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### COST OF BONDS

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### TOTAL OF CONTRACT MODIFICATION

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COST BREAKDOWN FOR CONTRACTOR PRICE PROPOSAL

CONTRACTOR:

CHANGE ORDER NUMBER: ___________________________ DATE: ____________

CHANGE ORDER DESCRIPTION:

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<tr>
<th>LABOR</th>
<th>NAME</th>
<th>CLASSIFICATION</th>
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<tr>
<td>TOTAL LABOR COSTS (Transfers to Line 1 of Sheet 1)</td>
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### COST BREAKDOWN FORM FOR CONTRACT MODIFICATION

#### SHEET 3 OF 3

**CHANGE ORDER NUMBER:**

**DATE:**

**CHANGE ORDER DESCRIPTION:**

---

#### SUBCONTRACTED WORK

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<th>SUBCONTRACTOR</th>
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**TOTAL COST OF SUBCONTRACTED WORK (Transfers to Line 10 of Sheet 1)**

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**CONTRACTOR:**

**Date:**

**VERIFIED BY INSPECTOR:**

**Date:**

---

**CONTRACTOR OR AUTHORIZED REPRESENTATIVE:**

---

**APPROVED BY INSPECTOR:**

---

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:
   1. Section 01 2600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
   2. Section 01 3200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

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

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
   1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
      a. Application for Payment forms with continuation sheets.
      b. Submittal schedule.
      c. Items required to be indicated as separate activities in Contractor's construction schedule.
   2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:
   a. Project name and location.
   b. Owner's name.
   c. Owner's Project number.
   d. Name of Architect.
   e. Architect's project number.
   f. Contractor's name and address.
   g. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.

3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
   a. Related Specification Section or Division.
   b. Description of the Work.
   c. Name of subcontractor.
   d. Name of manufacturer or fabricator.
   e. Name of supplier.
   f. Change Orders (numbers) that affect value.
   g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
      1) Labor.
      2) Materials.
      3) Equipment.

   a. Include separate line items under Contractor and principal subcontracts for final project documentation, including other sustainable initiatives as specified in related sections, and other Project closeout requirements in an amount totaling seven percent of the Contract Sum and subcontract amount.

5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

8. Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.

9. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
10. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.

11. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
   1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
   2. In the event Contractor has opted to enter into the Escrow Agreement for Security Deposits in Lieu of Retention (Document 00680), applications for payments shall comport with the provisions of that agreement as well as California Public Contract Code Section 22300.

B. Payment Application Times: Submit Application for Payment to Architect by the 25th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
   1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 or other forms acceptable to the Owner as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
   1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
   2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
   3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
   4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
   1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
   2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
   3. Provide summary documentation for stored materials indicating the following:
a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
   1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
   1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
   2. When an application shows completion of an item, submit conditional final or full waivers.
   3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
   4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
   1. List of subcontractors.
   2. Schedule of values.
   3. Contractor's construction schedule (preliminary if not final).
   4. Products list (preliminary if not final).
   5. Schedule of unit prices.
   6. Submittal schedule (preliminary if not final).
   7. List of Contractor's staff assignments.
   8. List of Contractor's principal consultants.
  11. Initial progress report.
  13. Certificates of insurance and insurance policies.
  15. Data needed to acquire Owner's insurance.

I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
a. Complete administrative actions, submittals, and Work preceding this application, as described in Section 01 7700 "Closeout Procedures."

2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited to, the following:

1. Evidence of completion of Project closeout requirements.
2. Certification of completion of final punch list items.
3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
4. Updated final statement, accounting for final changes to the Contract Sum.
5. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
7. AIA Document G707, "Consent of Surety to Final Payment."
8. Evidence that claims have been settled.
9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
10. Final liquidated damages settlement statement.
11. Proof that taxes, fees, and similar obligations are paid.
12. Waivers and releases.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. General coordination procedures.
   2. Coordination drawings.
   3. Requests for Information (RFIs).
   4. Project meetings.

B. Related Requirements:
   1. Section 01 3200 "Construction Progress Documentation" for preparing and submitting Contractor’s construction schedule.
   2. Section 01 7300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
   3. Section 01 7700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. BIM: Building Information Modeling.

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

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

D. Frivolous RFI's:
   1. RFI's which request information that is clearly shown on the Contract Documents as determined by the Architect.
   2. Contractor is responsible to review all coordination questions and relay information within the documents to subcontractors, vendors, and/ or suppliers.
   3. The Contractor may be assessed $100.00 for each frivolous RFI at closeout.

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

1.4 INFORMATIONAL SUBMITTALS

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

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

1.5 GENERAL COORDINATION PROCEDURES

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

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

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

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
   1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
      a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
      b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
      c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
      d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
      e. Indicate required installation sequences.
      f. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:
   1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of
visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.

2. **Plenum Space**: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.

3. **Mechanical Rooms**: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.

4. **Structural Penetrations**: Indicate penetrations and openings required for all disciplines.

5. **Slab Edge and Embedded Items**: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.

6. **Mechanical and Plumbing Work**: Show the following:
   a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
   b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
   c. Fire-rated enclosures around ductwork.

7. **Electrical Work**: Show the following:
   a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
   b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
   c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
   d. Location of pull boxes and junction boxes, dimensioned from column center lines.

8. **Fire-Protection System**: Show the following:
   a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

9. **Review**: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.

10. **Coordination Drawing Prints**: Prepare coordination drawing prints according to requirements in Section 01 3300 "Submittal Procedures."

C. **Coordination Digital Data Files**: Prepare coordination digital data files according to the following requirements:

1. **File Preparation Format**: Same digital data software program, version, and operating system as original Drawings.

2. **File Submittal Format**: Submit or post coordination drawing files using format same as file preparation format and Portable Data File (PDF) format.

3. **Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files as specified in related Section 01 1150 "Electronic Drawings"**
   a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
   b. **Digital Data Software Program**: Drawings are available in AutoCAD Format.
   c. Contractor shall execute a data licensing agreement in the form of Agreement included in this Project Manual or an Agreement form acceptable to Owner and Architect.
1.7 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
   1. Include special personnel required for coordination of operations with other contractors.

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

1.8 REQUEST FOR INFORMATION (RFI)

A. An RFI is a written request prepared by the Contractor asking the Architect to provide additional information necessary to clarify an item which the Contractor feels is not clearly shown or called for in the drawings or specifications, or to address questions which have arisen under field conditions.

B. An RFI cannot modify the Contract Cost, Contract Time, or the Contract Documents.

Retain the following for a Web Based system

C. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
   1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

D. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
   1. Project name.
   2. Project number.
   3. Date.
   4. Name of Contractor.
   5. Name of Architect.
   6. RFI number, numbered sequentially.
   7. RFI subject.
   8. Specification Section number and title and related paragraphs, as appropriate.
   9. Drawing number and detail references, as appropriate.
   10. Field dimensions and conditions, as appropriate.
   11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
   12. Contractor's signature.
   13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

E. RFI Forms: Form bound in Project Manual or a Software-generated form with substantially the same content as indicated above, acceptable to Architect.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

F. Contractor shall endeavor to keep the number of RFI's to a minimum.

G. RFI's shall be originated by the Contractor.
   1. RFI's from subcontractors or material suppliers shall be submitted through, reviewed by, and signed by the Contractor prior to submittal to the Architect and Construction Manager.
   2. RFI's from subcontractors or material suppliers sent directly to the Construction Manager, Architect or the Architect's consultants shall not be accepted and will be returned unanswered.

H. Contractor shall carefully study the Contract Documents to assure that the requested information is not available therein. RFI's that request information available in the Contract Documents will be deemed either "improper" or "frivolous" as noted above.

I. In the cases where RFI's are issued to request clarification of coordination issues, for example, pipe and duct routing, clearances, specific locations of work shown diagrammatically, and similar items, the Contractor shall fully lay out a suggested solution using drawings or sketches drawn to scale, and submit same with the RFI.
   1. RFI's not conforming to these requirements will be deemed either "improper" or "frivolous" as noted above.

J. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow fourteen (14) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day. If the Architect cannot respond to the RFI within fourteen (14) calendar days, the Architect shall notify the Contractor and the Owner, of the estimated amount of time that will be required to respond.
   1. The following Contractor-generated RFIs will be returned without action. Time spent by the Architect in identifying and managing the following will be compensable as described below for frivolous RFIs:
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for approval of Contractor's means and methods.
      d. Requests for coordination information already indicated in the Contract Documents.
      e. Requests for adjustments in the Contract Time or the Contract Sum.
      f. Requests for interpretation of Architect's actions on submittals.
      g. Incomplete RFIs or inaccurately prepared RFIs, as determined by the Architect.
   2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
   3. Frivolous RFIs: The Contractor may be invoiced by the Owner for any costs incurred for professional services, which shall be deducted from the next progress payment, for each RFI requesting an interpretation or decision of a matter where the information sought is equally available to the party making such request, or as otherwise defined in this section as frivolous.
   4. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 2600 "Contract Modification Procedures."
a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

K. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

L. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1.9 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model will be provided by Architect for Contractor's use during construction.
1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner and Architect.
   a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement acceptable to Owner and Architect.

B. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.10 ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS (ASI)

A. An ASI is a written supplemental instruction issued and signed by the Architect for minor changes to the Work, without change in Contract Sum or Contract Time.

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

1.11 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
   3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
   1. Conduct the conference to review responsibilities and personnel assignments.
   2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   3. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedule.
      b. Phasing.
      c. Critical work sequencing and long-lead items.
      d. Designation of key personnel and their duties.
      e. Lines of communications.
      f. Procedures for processing field decisions and Change Orders.
      g. Procedures for RFIs.
      h. Procedures for testing and inspecting.
      i. Procedures for processing Applications for Payment.
      j. Distribution of the Contract Documents.
      k. Submittal procedures.
      l. Sustainable design requirements.
      m. Preparation of record documents.
      n. Use of the premises.
      o. Work restrictions.
      p. Working hours.
      q. Owner's occupancy requirements.
      r. Responsibility for temporary facilities and controls.
      s. Procedures for moisture and mold control.
      t. Procedures for disruptions and shutdowns.
      u. Construction waste management and recycling.
      v. Parking availability.
      w. Office, work, and storage areas.
x. Equipment deliveries and priorities.
y. First aid.
z. Security.
  aa. Progress cleaning.

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

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   b. Options.
   c. Related RFIs.
   d. Related Change Orders.
   e. Purchases.
   f. Deliveries.
   g. Submittals.
   h. Sustainable design requirements.
   i. Review of mockups.
   j. Possible conflicts.
   k. Compatibility requirements.
   l. Time schedules.
   m. Weather limitations.
   n. Manufacturer's written instructions.
   o. Warranty requirements.
   q. Acceptability of substrates.
   r. Temporary facilities and controls.
   s. Space and access limitations.
   t. Regulations of authorities having jurisdiction.
   u. Testing and inspecting requirements.
   v. Installation procedures.
   w. Coordination with other work.
   x. Required performance results.
   y. Protection of adjacent work.
   z. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.

2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
   a. Preparation of record documents.
   b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
   c. Procedures for completing and archiving web-based Project software site data files.
   d. Submittal of written warranties.
   e. Requirements for completing sustainable design documentation.
   f. Requirements for preparing operations and maintenance data.
   g. Requirements for delivery of material samples, attic stock, and spare parts.
   h. Requirements for demonstration and training.
   i. Preparation of Contractor's punch list.
   j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
   k. Submittal procedures.
   l. Coordination of separate contracts.
   m. Owner's partial occupancy requirements.
   n. Installation of Owner's furniture, fixtures, and equipment.
   o. Responsibility for removing temporary facilities and controls.

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

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

1. Coordinate dates of meetings with preparation of payment requests.

2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
   a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      1) Review schedule for next period.
   b. Review present and future needs of each entity present, including the following:
      1) Interface requirements.
      2) Sequence of operations.
      3) Resolution of BIM component conflicts.
      4) Status of submittals.
      5) Status of sustainable design documentation.
      6) Deliveries.
      7) Off-site fabrication.
8) Access.
9) Site utilization.
10) Temporary facilities and controls.
11) Progress cleaning.
12) Quality and work standards.
13) Status of correction of deficient items.
14) Field observations.
15) Status of RFIs.
16) Status of proposal requests.
17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

3.1 FORMS
A. Attached to the end of this Section are the following forms for the Contractors use.
1. Request for Information form.
REQUEST FOR INFORMATION

RFI #: ____________________

DATE: ____________________  COST IMPACT  Y / N (Circle One)

Project: ____________________  DWG REF: ____________________

SUBJECT: ____________________  SPEC REF: ____________________

QUESTION:

RESPONSE NEEDED BY: ____________________

SUGGESTED SOLUTION:

SIGNATURE: ____________________  DATE: ____________________

ANSWER:

SIGNATURE: ____________________  DATE: ____________________

PROJECT MANAGEMENT & COORDINATION

01 3100 - 12
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Startup construction schedule.
   2. Contractor's construction schedule.
   3. Construction schedule updating reports.
   4. Daily construction reports.
   5. Material location reports.
   6. Site condition reports.
   7. Unusual event reports.
B. Related Requirements:
   1. Section 01 3300 "Submittal Procedures" for submitting schedules and reports.
   2. Section 01 4000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS
A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.
B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.
C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

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

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

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

G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:
   1. Working electronic copy of schedule file, where indicated.
   2. PDF electronic file.

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

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

D. Contractor’s Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
   1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.

E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
   1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
   2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
   3. Total Float Report: List of all activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor’s total earnings from the Notice to Proceed until most recent Application for Payment.

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

G. Daily Construction Reports: Submit at monthly intervals.

H. Material Location Reports: Submit at monthly intervals.

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

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

K. Qualification Data: For scheduling consultant.

1.5 COORDINATION

A. Coordinate Contractor’s construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

   1. Secure time commitments for performing critical elements of the Work from entities involved.
   2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.6 CONTRACTOR’S CONSTRUCTION SCHEDULE

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

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

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

C. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

   1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
   2. Temporary Facilities: Indicate start and completion dates for the following as applicable:
      b. Temporary facilities.
      c. Construction of mock-ups, prototypes and samples.
      d. Owner interfaces and furnishing of items.
      e. Interfaces with Separate Contracts.
      f. Regulatory agency approvals.
      g. Punch list.
3. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.


5. Startup and Testing Time: Include no fewer than 15 days for startup and testing.

6. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

7. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.

2. Work under More Than One Contract: Include a separate activity for each contract.

3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.

4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 01 1100 "Summary of Work." Delivery dates indicated stipulate the earliest possible delivery date.

5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 1100 "Summary of Work." Delivery dates indicated stipulate the earliest possible delivery date.

6. Work Restrictions: Show the effect of the following items on the schedule:
   a. Coordination with existing construction.
   b. Limitations of continued occupancies.
   c. Uninterruptible services.
   d. Partial occupancy before Substantial Completion.
   e. Use of premises restrictions.
   g. Seasonal variations.
   h. Environmental control.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion, and the following interim milestones:

1. Temporary enclosure and space conditioning.

F. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.

1. See Section 01 2900 "Payment Procedures" for cost reporting and payment procedures.

G. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.

H. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
   1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
   2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3. As the Work progresses, indicate final completion percentage for each activity.

I. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

J. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms and temporary field offices.
   2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.7 GANTT CHART SCHEDULE REQUIREMENTS

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice to Proceed.
   1. Base schedule on the startup construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
   1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.8 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
   1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
8. Accidents.
9. Meetings and significant decisions.
10. Unusual events (see special reports).
11. Stoppages, delays, shortages, and losses.
12. Meter readings and similar recordings.
14. Orders and requests of authorities having jurisdiction.
15. Change Orders received and implemented.
16. Construction Change Directives received and implemented.
17. Services connected and disconnected.
18. Equipment or system tests and startups.
19. Partial completions and occupancies.
20. Substantial Completions authorized.

B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.
2. Material stored prior to previous report and since removed from storage and installed.
3. Material stored following previous report and remaining in storage.

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Submit unusual event reports directly to Owner within [one] <Insert number> day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:
   1. Section 01 1150 "Electronic Drawings".
   2. Section 01 2900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
   3. Section 01 3100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
   4. Section 01 3200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
   5. Section 01 4000 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
   6. Section 01 7700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
   7. Section 01 7823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
   8. Section 01 7839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

10. WORK NOT INCLUDED

A. Submittals which are not required will not be reviewed by the Architect.

B. The Contractor may require subcontractors to provide drawings, setting diagrams or similar information as part of the coordination of the Work. The Architect will not review this data.

C. Material Safety Data Sheets (MSDS) - Limitation of Review: Certain Submittals require provision of these documents by the Contractor. These documents contain information necessary for operation of the facility. The Architect's review of these submittals is limited to noting inclusion of...
the document for the Owner's use. No further review or comment on MSDS documents by Architect shall be performed or inferred.

1.4 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.


1.5 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. 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 current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:
   a. Scheduled date for first submittal.
   b. Specification Section number and title.
   c. Submittal category: Action; informational.
   d. Name of subcontractor.
   e. Description of the Work covered.
   f. Scheduled date for Architect's final release or approval.
   g. Scheduled date of fabrication.
   h. Scheduled dates for purchasing.
   i. Scheduled dates for installation.
j. Activity or event number.

### 1.6 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal on a transmittal form generated from electronic project management software or other electronic form acceptable to Owner, containing the following information:

1. Project name.
2. Date.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
   a. Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
8. Category and type of submittal.
10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
11. Drawing number and detail references, as appropriate.
12. Indication of full or partial submittal.
13. Location(s) where product is to be installed, as appropriate.
14. Other necessary identification.
15. Remarks.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

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., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
1.7 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

2. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.

B. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals as specified in Section 01 1150 “Electronic Drawings”.
      a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
      b. Digital Drawing Software Program: The Contract Drawings are available in Revit format.
      c. Refer to Section 01 1150 “Electronic Drawings”.
      d. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual.
      e. The following digital data files will be furnished for each appropriate discipline:
         1) Floor plans.
         2) Reflected ceiling plans.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
   3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
   4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
   1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
   2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
   3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

E. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
   3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

F. 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.

G. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.8 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
   1. If information must be specially prepared for submittal because standard published data are 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. Modify standard data to delete information or products which are not pertinent.
   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.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
   1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

C. 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. Project name and submittal number.
   b. Generic description of Sample.
   c. Product name and name of manufacturer.
   d. Sample source.
   e. Number and title of applicable Specification Section.
   f. Specification paragraph number and generic name of each item.

3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.

4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

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 two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   a. Number of Samples: Submit maximum of seven sets of Samples. Architect will return seven Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

D. Colors and Patterns:
1. Submit color and pattern selections for all products offering a choice of these attributes unless a specific color or pattern is referenced in the Contract Documents.
2. Submit within 35 days of Notice of Award a list of all required color selections organized by product, including manufacturer and model. Include samples of manufacturer's complete color range for all products.
3. Architect will not select colors or patterns until samples of all items requiring selections have been submitted. Architect will not make partial color selections.
4. Failure to submit all color selections as specified above, thus requiring additional unanticipated time for the Architect to make selections will not be basis for extension of Contract Time.
5. Architect will make color selections within 30 working days following complete submittal of samples. This period will commence with the receipt of the latest incremental submittal, as applicable.
6. Architect will issue Color Schedule.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. 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.

F. 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.

G. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

H. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.


I. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.

2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
   a. Name of evaluation organization.
   b. Date of evaluation.
   c. Time period when report is in effect.
   d. Product and manufacturers' names.
   e. Description of product.
   f. Test procedures and results.
   g. Limitations of use.

J. Coordination Drawing Submittals: Comply with requirements specified in Section 01 3100 "Project Management and Coordination."

K. Contractor's Construction Schedule: Comply with requirements specified in Section 01 3200 "Construction Progress Documentation."

L. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 2900 "Payment Procedures."

M. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 4000 "Quality Requirements."

N. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 7700 "Closeout Procedures."

O. Maintenance Data: Comply with requirements specified in Section 01 7823 "Operation and Maintenance Data."
1.9 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are 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 and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
   1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

C. Contractor is notified that significant lead time is required for delegated design review by Agency or Authority Having Jurisdiction and shall schedule work accordingly. No extension of Contract Time will be allowed for delays incurred by delegated design review.
   1. The Architect is not responsible for Agency or Authority Having Jurisdiction delays in delegated design review.

1.10 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
   1. Assume full responsibility for coordinating and verifying information, quantities and dimensions shown in submittals.
   2. Note all deviations from the Contract Documents in writing and request Architect approval of deviation in writing.
   3. Direct Architect's attention in writing to all changes made in submittals other than those specifically requested by Architect. Changes not so noted will be considered unreviewed.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
   1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

C. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 7700 "Closeout Procedures."

D. Transmit submittals in groups containing all associated items to ensure availability of information during review. Refer to more specific requirements in the technical divisions.
   1. Do not submit partial submittals.
   2. Incomplete or partial submittals may be returned for enhancement. No extension of time will be allowed for delays related to incomplete submittals.
E. Stagger submittals for items or products with shorter lead times, reduced coordination needs with other work, or which will be needed later in the construction schedule. Prioritize and coordinate submittals only according to jointly-agreed initial list. Items requiring longer lead times shall be submitted first.

F. Do not provide submittals out-of-sequence. Submittals forwarded earlier than indicated on the jointly agreed schedule may be retained by the Architect for later processing. Required submittals which are not shown on the jointly-agreed schedule, or forwarded at times varying from the agreed schedule will be processed at the Architect’s option. Minimum review period may be extended by the Architect for early or out-of-sequence submittals.

G. Accept reviewed submittals in the conditions delivered by the Architect. Architect reserves right to manage submittal review and stamping in any manner deemed expedient by the Architect and acceptable to the Owner and Authority Having Jurisdiction. These conditions of distribution may include, but not be limited to:
   1. Retention of all original documentation submitted and distribution of copies only, including original signatures of Agency reviewers, other Authorities Having Jurisdiction, Contractor's Design Professionals.
   2. Stamping/signature of the cover page only, not each drawing, document or item submitted.
   3. Summarizing complex comments in the form of memo or summary notation, without copying or enumeration of each and every occurrence of a comment. Such copying and enumeration, if required, shall be performed by the Contractor.
   4. Conditional or limited degree of approval/acceptance such as "Color/Texture Only" and similar reservations.

H. Distribute only submittals with Architect/Engineer (and Authority Having Jurisdiction as applicable) stamps of review. Contractor is responsible for coordination of submittals and comments following review. Contractor to provide all additional reproduction costs for copies required by the Contractor at his expense. No additional costs will be authorized for Contractor costs pertaining to submittals.

I. Ensure that all reviewed Submittals are distributed intact with all comments, memos and attachments in place as received from the Architect. Owner and Architect will not be responsible for errors due to Contractor failure to transmit, coordinate or record Architect or Engineer comments.

1.11 ARCHITECT’S ACTION

A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required.
   1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action.

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
E. Submittals not required by the Contract Documents may be returned by the Architect without action.

F. Architect will respond in writing to Contractor’s written notifications of deviations from Contract Documents. No deviations from Contract Documents will be covered by the Architect’s review unless requested by the Contractor in writing and approved by the Architect in writing.

G. Submittals reviewed by the Architect which have been stamped shall be deemed to have the action stamp language affixed and made a part thereof, regardless of the initial or subsequent readability of the actual stamp.

H. Architect's review of submittals has, as a primary objective, to assist in the completion of the project on time and in conformance with the Contract requirements by permitting review of material and fabricated items prior to ordering. Architect's review of submittals is based only on the data presented and extends only to conformance with general design intent and information contained in the Contract Documents.

I. Architect's review of submittals does not constitute final acceptance or unqualified approval of items or work proposed or put in place, nor does it constitute acceptance of responsibility for the accuracy, coordination or completeness of submittals. Architect's review of submittals does not relieve the Contractor from the responsibility for errors, omissions, or compliance with all the requirements of the Contract Documents.

J. Contractor shall accept reviewed submittals in the conditions delivered by the Architect. Architect reserves right to manage submittal review and stamping in any manner deemed expedient by the Architect and acceptable to the Owner and Authorities Having Jurisdiction. These conditions of distribution may include, but not be limited to:

1. Retention of all original documentation submitted and distribution of copies only, including original signatures of Agency review, other Authorities Having Jurisdiction, Design Professionals retained by the Contractor.

2. Stamping/signature of the cover page only, not each drawing, document or item submitted.

3. Summarizing complex comments in the form of memo or summary notation, without copying or enumeration of each and every occurrence of a comment. Such copying and enumeration shall be performed by the Contractor.

4. Conditional or limited degree of approval/acceptance such as "Color/Texture Only" and similar reservations.

5. Contractor shall ensure that all reviewed Submittals are distributed intact with all comments, memos and attachments in place as received from the Architect. Owner nor Architect will not be responsible for errors due to failure to coordinate or record A/E comments.

- END OF SECTION -
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes: General requirements for the submittal of plans, details, and calculations for engineered products and systems designated as deferred submittal and/or delegated design/design-build components on the Drawings, and as listed within this Section.
   1. To ensure that the specified products are furnished and installed in accordance with the design intent, these procedures have been established for advance submittal of design data, and for review and acceptance or rejection by the Architect.
B. Contractor is responsible to obtain all regulatory approvals, including obtaining required permits and inspections at no additional cost to the Owner.

1.3 DEFERRED APPROVAL PRODUCTS & SYSTEMS
A. Provide Deferred Approval submittals for review for the following items:
   1. Fire Alarm.

1.4 SUBMITTAL PROCEDURES
A. The number of copies of each type of submittal and distribution procedures shall be determined at the pre-construction conference.
   1. Allow sufficient copies for Owner, General Contractor, Architect and Architect’s consultants, and agency having jurisdiction (AHJ), as applicable.
   2. Determine which submittals shall be provided on reproducible material.
B. Make submittals sufficiently in advance of scheduled dates of installation to provide adequate time for securing necessary approvals, for revision and resubmittal, and for placing orders and securing delivery.
C. Submit special detailed drawings, schedules, or other data prepared by qualified detailers. Identify details by reference to the Drawing sheet and detail numbers and by Specification Section and article numbers.

D. Deferred Approval submittals shall meet the requirements for any permit submittals that may be required for construction and shall include not less than the following:
   1. Dimensioned plans, elevations, and sections locating assembly components in relationship to each other and in relationship to contiguous building structure or site elements.
   2. Typical and special fabrication and installation details.
   3. Design criteria, drawings and calculations.
   4. Materials and finishes.

E. Schedule: Submit all Deferred Approval submittals within 60 days after Award of Contract.

F. Do Not Begin Work requiring submittals until the submittals have been returned with the AHJ and Architect’s stamp indicating review and acceptance.

1.5 QUALITY ASSURANCE

A. Contractor shall be responsible for the design, engineering, fabrication, and installation of design-build items within the physical limitations and design parameters indicated in the Drawings.
   1. Submittals of drawings and calculations for structural items shall be wet stamped and signed by a professional Structural Engineer licensed to practice in the state of the Project location.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 APPROVAL PROCEDURES

A. Preliminary Submittal: Submit design data, latest printed product literature, color schedules, samples, and other data to Architect per Section 01 3300 “Submittal Procedures” illustrating intent to meet design and performance requirements.

B. Agency Submittal: Upon acceptance of item by Architect, submit complete calculations and other data to AHJs for review and approval with transmittal copy to Owner and Architect.

C. Final Submittal: Upon receipt of approval by AHJs, obtain all required permits and submit to Owner.

- END OF SECTION -
- SECTION 01 4000 -

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

2. Specific tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.

4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

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

C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

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

1. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements, consisting of multiple products, assemblies, and subassemblies, with cutaways enabling inspection of concealed portions of the Work.
   a. Include each system, assembly, component, and part of the exterior wall to be constructed for the Project. Colors of components shall be those selected by the Architect for use in the Project.

2. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes; doors; windows; millwork; casework; specialties; furnishings and equipment; and lighting.

3. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.

4. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.

E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" shall have the same meaning as the term "testing agency."

I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.
1.4 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.5 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

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

1.7 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
   1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
   1. Specification Section number and title.
   2. Entity responsible for performing tests and inspections.
   3. Description of test and inspection.
   4. Identification of applicable standards.
   5. Identification of test and inspection methods.
   6. Number of tests and inspections required.
   7. Time schedule or time span for tests and inspections.
   8. Requirements for obtaining samples.
   9. Unique characteristics of each quality-control service.

F. Reports: Prepare and submit certified written reports and documents as specified.

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

1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
   1. Project quality-control manager may also serve as Project superintendent.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
   1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
   2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
   1. Date of issue.
   2. Project title and number.
   3. Name, address, and telephone number of testing agency.
   4. Dates and locations of samples and tests or inspections.
   5. Names of individuals making tests and inspections.
   6. Description of the Work and test and inspection method.
   8. Complete test or inspection data.
   9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of technical representative making report.
   2. Statement on condition of substrates and their acceptability for installation of product.
   3. Statement that products at Project site comply with requirements.
   4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   6. Statement whether conditions, products, and installation will affect warranty.
   7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.10 QUALITY ASSURANCE

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

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

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

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

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
   1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
   2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and
perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following Contractor's responsibilities, including the following:
1. Provide test specimens representative of proposed products and construction.
2. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
3. Provide sizes and configurations of test assemblies and mockups adequately demonstrate capability of products to comply with performance requirements.
4. Build site-assembled test assemblies and mockups, using installers who will perform same tasks for Project.
5. When testing is complete, remove test specimens and test assemblies and mockups; do not reuse products on Project.
6. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect[and Commissioning Authority], with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.

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

L. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.
1.11 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
   2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
   1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
   2. Engage a qualified testing agency to perform quality-control services.
      a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
   3. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.
   4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
   5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
   6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

   1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
   4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
   6. Do not perform duties of Contractor.

E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 3300 "Submittal Procedures."
F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

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

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

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.

1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
2. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.12 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

1. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
3. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Retesting and reinspecting corrected work.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Architect.
   4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and
   inspection log for Architect's reference during normal working hours.
   1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair
damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification
      Sections or matching existing substrates and finishes. Restore patched areas and extend
      restoration into adjoining areas with durable seams that are as invisible as possible.
      Comply with the Contract Document requirements for cutting and patching in Section 01
      7300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of
   responsibility for quality-control services.

- END OF SECTION -
PART 1 GENERAL

1.1 SUMMARY
- Section includes: regulatory and other legal requirements applicable to Contract Documents.
- Specific reference in the Specifications to codes and regulations or requirements of regulatory agencies shall mean the latest printed edition of each adopted by the regulatory agency in effect at the time of the opening of Bids, except as may be otherwise specifically stated in the Contract Documents.

Should any conditions develop not covered by the Contract Documents wherein the finished Work will not comply with current codes, a Change Order detailing and specifying the required Work shall be submitted to and approved by Library before proceeding with the Work.

1.2 REFERENCES TO REGULATORY REQUIREMENTS
Codes, laws, ordinances, rules and regulations referred to shall have full force and effect as though printed in full in these Specifications. Code, laws, ordinances, rules and regulations are not furnished to Contractor, because Contractor is assumed to be familiar with these requirements. The listing of applicable codes, laws, and regulations for hazardous waste abatement Work in the Contract Documents is supplied to Contractor as a courtesy and shall not limit Contractor’s responsibility for complying with all applicable laws, regulations, or ordinances having application to the Work. Where conflict among the requirements or with these Specifications occurs, the most stringent requirements shall be used.

Contractor shall conform to referenced codes, laws, ordinances, rules and regulations.

1.3 CODES
Codes that may apply to Contract Documents include, but are not limited to, the following:

CBC (Part 2, Title 24, CCR, including, without means of limitation, Sections 16A, 102A.23, 308, 420A, 504-506, 904.2.6, 1019 and 1604)
CEC (Part 3, Title 24, CCR)
CMC (Part 4, Title 24, CCR)
CPC (Part 5, Title 24, CCR),
California Energy Code (Part 6, Title 24 CCR)
State Elevator Safety Regulations (Part 7, Title 24, CCR)
California Green Building Standards Code (CALGreen) (Part 11, Title 24, CCR)
UBC
UPC
UMC
NEC

1.4 LAWS, ORDINANCES, RULES, AND REGULATIONS
A. During prosecution of Work to be done under Contract Documents, Contractor (and all subcontractors and material suppliers) shall comply with applicable laws, ordinances, rules and regulations, including, but not limited to, the following:

1. Federal:
   Americans With Disabilities Act of 1990
   29 CFR, Section 1910.1001, Asbestos
   40 CFR, Subpart M, National Emission Standards for Asbestos
Executive Order 11246
Federal Endangered Species Act
Clean Water Act

2. State of California:
   California Code of Regulations, Titles 5, 8, 19, 22, 24 and 25
   California Public Contract Code
   California Health and Safety Code
   California Government Code
   California Labor Code
   California Civil Code
   California Code of Civil Procedure
   CPUC General Order 95, Rules for Overhead Electric Line Construction
   CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications Systems
   Cal/OSHA
   OSHA: Hazard Communications Standards
   California Endangered Species Act
   Water Code
   Fish and Wildlife Code

3. State of California Agencies:
   State and Consumer Services Agency
   Office of Statewide Health Planning and Development
   Department of Fish and Wildlife
   Bay Area Air Quality Management District
   San Francisco Bay Regional Water Quality Control Board
   North Coast Regional Water Quality Control Board
   Order No. 93-61
   Order No. 81-73
   Clean Water Act Section 401

4. Local Agencies:
   Applicable County of Sonoma and City of Santa Rosa Ordinances
   Northern Sonoma County Air Pollution Control District

5. Other Requirements:
   References on Drawings or in Specifications to “code” or “building code” not otherwise identified shall mean the codes specified in this Document 014100, together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction.

B. Other Applicable Laws, Ordinances and Regulations:
   1. Work shall be accomplished in conformance with all applicable laws, ordinances, rules and regulations of federal, state, and local governmental agencies and jurisdictions having authority over the Project.
   2. Where such laws, ordinances rules, and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to the Contract Time and Contract Sum, except where changes in laws, ordinances, rules, and regulations occur subsequent to the time of opening of the Bids.

C. Change Orders and Claims. The California Public Contract Code (including but not limited to Section 7105(d)(2)) and the California Government Code (Section 930.2, et seq.) apply to all contract procedures for changes, time extensions, change orders (time and money), and claims.
Federal law (U.S. v. Holpuch 326 U.S. 234) shall supplement but not supercede California law on these requirements. Any change, alteration, Modifications, waiver, or omission to implement these procedures, shall have no legal effect unless approved in advance in a fully executed Change Order approved by the Library's Commission or the Library official it designates for that purpose.

1.5 Precedence
A. Where Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, Drawings and Specifications shall take precedence so long as such increase is legal.
B. Where no requirements are identified on Drawings or in Specifications, comply with all requirements of applicable codes, ordinances and standards of governing authorities having jurisdiction.
C. Conflicts between referenced regulatory requirements: comply with the one establishing the more stringent requirement.
D. Conflicts between referenced regulatory requirements and Contract Documents: comply with the one establishing the more stringent requirement.

1.6 REQUIRED PROVISIONS ON CONTRACT CLAIM RESOLUTION

1.6.1 California Public Contract Code Section 9204 (“Section 9204”) specifies required procedures for resolving Contractor claims and constitute a part of the Contract pursuant to Document 007200 (General Conditions), Article 12. As required by law, a summary of Section 9204 is as follows.
A. **Scope.** For purposes of Section 9204, a “claim” under this provision means a separate demand by Contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following: (1) a time extension; (2) payment by the Library of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Contract Documents and payment for which is not otherwise expressly provided or to which the Contractor is not otherwise entitled; and/or (3) payment of an amount that is disputed by the Library. In order to qualify as a claim under this section, the written demand must state that it is a claim submitted under Article 12 of Document 007200 (General Conditions) and California Public Contract Code Section 9204, and be submitted in compliance therewith.
B. **Procedures.** The claim must be in writing, provide detailed information, and be accompanied by reasonable documentation to support the claim. Claims must be filed on or before the day of final payment. Nothing in this section is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth in Document 007200 (General Conditions), Article 12 or elsewhere in the Contract Documents or applicable law.
1. Upon receipt of a claim pursuant to this section, the Library shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, the Library and Contractor may, by mutual agreement, extend the time period provided in this subdivision.
2. If the Library needs approval from its Commission to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the claim, and the Commission does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the Library shall have up to three days following the next duly publicly noticed meeting of the Commission after the 45-day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.
3. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the Library issues its written statement.
4. If the Contractor disputes the Library's written response, or if the Library fails to respond to a claim issued pursuant to this section within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or
certified mail, return receipt requested, the Library shall schedule a meet and confer conference within 30 days for settlement of the dispute.

5. Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the Library shall provide the Contractor a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the Library issues its written statement. Any disputed portion of the claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the Library and the Contractor sharing the associated costs equally. The Library and the Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.

6. Failure by the Library to respond to a claim from Contractor within the time periods described herein or to otherwise meet the time requirements of this section shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the Library’s failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the Contractor.

7. Amounts not paid in a timely manner as required by this section shall bear interest at 7 percent per annum.

1.6.2 California Public Contract Code Sections 20104, et seq. ("Sections 20104, et seq.") specify procedures for resolving Contractor claims of $375,000 or less, and constitute a part of the Contract pursuant to Document 007200 (General Conditions), Article 12. As required by law, a summary of Sections 20104, et seq. is as follows:

A. Scope. A “claim” under this provision means a separate demand by Contractor of $375,000 or less for (1) a time extension, (2) payment by the Library of money or damages arising from work done by or on behalf of Contractor pursuant to the Contract Documents and payment of which is not otherwise expressly provided for or the Contractor is not otherwise entitled to, and/or (3) an amount the payment of which is disputed by Library. In order to qualify as a claim under this section, the written demand must state that it is a claim submitted under Article 12 of Document 007200 (General Conditions) and California Public Contract Code Section 20104, et seq., and be submitted in compliance therewith. Separate Claims which total more than $375,000 do not qualify as a “separate demand of $375,000 or less,” as referenced above, and are not subject to this section.

B. Procedures. The claim must be in writing, provide detailed information, and be accompanied by reasonable documentation to support the claim. Claims must be filed on or before the day of final payment. Nothing in this section is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth in Document 007200 (General Conditions), Article 12 or elsewhere in the Contract Documents or applicable law.

1. For Claims of Fifty Thousand Dollars ($50,000) or less:
   a. Library shall respond in writing within forty-five (45) days of receipt of the claim, or
   b. Library may request in writing within thirty (30) days of receipt of the claim, any additional documentation supporting the claim or relating to any defenses or claims Library may have against Contractor.
      i. If additional information is thereafter required, it shall be requested and provided in accordance with this section, upon mutual agreement of Library and Contractor.
      ii. Library’s written response to the claim, as further documented, shall be submitted to Contractor within fifteen (15) days after receipt of further
documentation or within a period of time no greater than taken by Contractor in producing the additional information, whichever is greater.

2. For Claims over Fifty Thousand Dollars ($50,000) and less than or equal to Three Hundred Seventy-Five Dollars ($375,000):

a. Library shall respond in writing within sixty (60) days of receipt of the claim, or

b. Library may request in writing within thirty (30) days of receipt of the claim, any additional documentation supporting the claim or relating to any defenses or claims Library may have against Contractor.

i. If additional information is thereafter required, it shall be requested and provided in accordance with this section, upon mutual agreement of Library and Contractor;

ii. Library’s written response to the claim, as further documented, shall be submitted to Contractor within thirty (30) days after receipt of further documentation or within a period of time no greater than taken by Contractor in producing the additional information, whichever is greater.

3. Meet and Confer:

a. If Contractor disputes Library’s written response, or Library fails to respond within the time prescribed above, Contractor shall notify Library, in writing, either within fifteen (15) days of receipt of Library’s response or within fifteen (15) days of Library’s failure to timely respond, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon demand Library will schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

b. Following the meet and confer conference, if the claim or any portion remains in dispute, Contractor may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the California Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time Contractor submits its written claim pursuant to the provisions of this section, until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

1.7 COMPLIANCE WITH AMERICANS WITH DISABILITIES ACT

Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services, and other activities provided by a public entity to the public, whether directly or through a contractor, must be accessible to the disabled public. Contractor shall provide the services specified in the Contract Documents in a manner that complies with the ADA and any and all other applicable federal, state, and local disability rights legislation. Contractor agrees not to discriminate against disabled persons in the provision of services, benefits, or activities provided under this Agreement and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents, or assigns shall constitute a material breach of the Contract Documents.

1.8 CAL/OSHA PERMIT. Obtain, as applicable, permit(s) as required by Cal/OSHA for the following:

A. Construction of trenches or excavations that are five feet or more in depth and into which a person is required to descend.

B. Construction or demolition of any building, structure, or scaffolding for falsework more than three stories high, or the equivalent height (36 feet).

C. Erection or dismantling of vertical shoring systems more than three stories high, or the equivalent height (36 feet).

1.9 BUILDING PERMIT(S)

All permits that may be required for the Work, such as building permits, deferred submittals (underground fire protection water supply system, fire sprinkler system, fire alarm system, fuel storage and tank, and kitchen exhaust hood systems), electrical, mechanical, fire prevention, irrigation, grading, slope protection, tree cutting, etc., shall be obtained by Contractor. Applicable permit fees will be reimbursed by Library to the extent specified in Document 007200 (General Conditions).
END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

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

B. Addenda: Written or graphic instruments issued prior to the opening of Bids, which clarify, correct or change the bidding requirements or the Contract Documents. Addenda shall not include the minutes of the Pre-bid Conference and Site Visit.

C. Additive Bid: The sum to be added to the Base Bid if the change in scope of work as described in Additive Bid is accepted by Owner.

D. Agreement: Agreement is the basic contract document that binds the parties to construction Work. Agreement defines relationships and obligations between Owner and Contractor and by reference incorporates Conditions of Contract, Drawings, and Specifications and contains Addenda and all Modifications subsequent to execution of Contract.

E. Alternate: Work added to or deducted from the Base Bid, if accepted by Owner.

F. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract. In no case will "approval" by Architect/Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of contract documents.

G. Approved Equal: Approved in writing by Owner as being of equivalent quality, utility and appearance.

H. Architect Or Architect/Engineer: The person holding a valid Architect's license, whose firm has been designated as the Architect to provide architectural services on the project.

I. Bid: The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

J. Bidder: One who submits a Bid.
K. **By Owner:** Work that will be performed by the Sonoma County Library or its agents at its expense.

L. **By Others:** Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by Owner, other contractors, or other means.

M. **Change Order:** A written instrument prepared by Architect and signed by Architect, Owner and Contractor, stating their agreement upon all of the following:
   1. a change in the Work,
   2. the amount of the adjustment in the Contract Sum, if any, and
   3. the amount of the adjustment in the Contract Time, if any.

N. **Concealed:** Work not exposed to view in the finished Work, including within or behind various construction elements.

O. **Contract Conditions:** Conditions of Contract define basic rights, responsibilities and relationships of Contractor and Owner and consists of two parts: General Conditions and Supplementary Conditions.
   1. General Conditions are general clauses, which are common to the Owner Contracts.
   2. Supplementary conditions modify or supplement General Conditions to meet specific requirements for this Contract.

P. **Contract Documents:** Contract Documents shall consist of the documents identified as the Contract Documents in Contract Agreement, plus all changes, addenda and modifications thereto.

Q. **Contract Modification:** Either:
   1. a written amendment to Contract signed by Contractor and Owner; or
   2. a Change Order; or
   3. a written directive for a minor change in the Work issued by Architect.

R. **Contract Sum:** The sum stated in the Agreement and, including authorized adjustments, the total amount payable by Owner to Contractor for performance of the Work and the Contract Documents. (Also referred to as the Contract Price.)

S. **Contract Times:** The number or numbers of days or the dates stated in the Agreement (i) to achieve substantial completion of the Work or designated milestones and/or (ii) to complete the Work so that it is ready for final payment and is accepted.

T. **Contractor:** The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neuter in gender. The term "Contractor" means the Contractor or its authorized representative.

U. **Contractor’s Employees:** Persons engaged in execution of Work under Contract as direct employees of Contractor, as subcontractors, or as employees of subcontractors.

V. **Date of Substantial Completion:** Date of Substantial Completion of Work or designated portion thereof is date certified by Architect when construction is sufficiently complete in accordance with Contract Documents for Owner to occupy Work or designated portion thereof for its use for which it is intended.

REFERENCES

01 4200 - 2
W. Day: One calendar day, unless the word "day" is specifically modified to the contrary.

X. Deductive Bid: The sum to be subtracting to the Base Bid if the change in scope of work as described in Deductive Bid is accepted by Owner.

Y. Defective: An adjective which, when modifying the word "Work", refers to Work that is unsatisfactory or unsuited for the use intended, faulty, or deficient, that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including but not limited to approval of samples and "or equal" items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by Owner). Architect is the judge of whether Work is defective.

Z. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed." However, no such implied meaning will be interpreted to extend the Architect's/Engineer's responsibility into the Contractor's responsibility of construction supervision.

AA. Drawings: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

BB. Engineer: Where referenced in General Conditions, the person holding a valid Engineer's license, whose firm has been designated (if any designated) within the Contract Documents as the Engineer to provide engineering services on the project.


DD. Exposed: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.

EE. Final Acceptance or Final Completion: All Work satisfactorily completed in accordance with Contract Documents. It includes, but is not limited to:
   1. All Systems having been tested and accepted as having met requirements of Contract Documents.
   2. All required instructions and training sessions having been given by Contractor.
   3. All as-built drawings and operations and maintenance manuals and Machine Inventory Sheets having been submitted by Contractor, reviewed by Architect/Engineer and accepted by Owner.
   4. All punch list work, as directed by Owner, having been completed by Contractor.
   5. Generally all work, except Contractor maintenance after Final Acceptance, having been completed to satisfaction of Owner.

FF. Force-Account: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other costs, plus a specified percentage for overhead and profit.

GG. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
HH. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated." No limitation of location is intended.

II. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

JJ. Inspector: The person engaged by Owner to inspect the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes.
1. The inspector is subject to approval by the Architect, Owner and he will report to Owner.
2. The terms "Inspector" and "Project Inspector" are used interchangeably in the Contract Documents.

KK. Latent: Not apparent by reasonable inspection, including but not limited to, the inspections and research required as a condition to bidding under the General Conditions.

LL. Library: The Sonoma County Library, the entity named as Owner in Section 01 1100 “Summary of Work.”

MM. Material or Materials: These words shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.

NN. Milestone: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.

OO. Modification: Same as Contract Modification.

PP. Not In Contract: Work that is outside the scope of work to be performed by Contractor under this Contract.

QQ. Notice Of Award: A written notice given by Owner to lowest responsive, responsible bidder advising that Bidder's bid and other qualifying information is acceptable to Owner, requiring Bidder to fulfill the requirements of the Contract.

RR. Notice To Proceed: A written notice given by Owner to Contractor fixing the date on which the Contract Time will commence to run and on which contractor shall start to perform Contractor's obligations under the Contract Documents.

SS. Off Site: Outside geographical location of the Project.

TT. Owner: Individual or entity named as Owner in Section 01 1100 “Summary of Work.” Unless otherwise expressly indicated or required by the context of usage, the terms “Library” and “Owner” as used in the Contract Documents shall be deemed references to the Sonoma County Library.

UU. Owner-Furnished, Contractor-Installed: Items furnished by Owner at its cost for installation by Contractor at its cost under this Contract.
VV. Owner Representative(s): The person or persons assigned by Owner to be Owner's representatives or, if so designated, agent(s) at the site.

WW. Progress Report: a periodic report submitted by Contractor to Owner with progress payment invoices accompanying actual work accomplished to the Project Schedule.
   1. See Section 01 2900 “Payment Procedures”
   2. See Section 01 3200 “Construction Progress Documentation”
   4. See Document 00600 General Conditions.

XX. Project: Total construction of which Work performed under this Contract may be whole or part.

YY. Project Manual: Project Manual consists of Bidding Requirements, Agreement, Bonds, Certificates, Contract Conditions, and Specifications. The Project Manual is deemed to include and incorporate all matters noted in any Addenda issued by or on behalf of the Owner during the bidding for the Work.

ZZ. ""Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

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

BBB. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

CCC. Request For Information (RFI): A document prepared by Contractor, Owner or Architect/Engineer requesting information from one of the parties regarding the Project or Contract Documents. The RFI system is also a means for Owner and Architect to submit Contract Document clarifications or supplements to Contractor.

DDD. Required: “As required”, “As needed”, “As necessary” and terms of similar import, where used, shall mean as required or as needed to complete the item or effort in question in accordance with the Contract Documents, applicable standards and specifications for the quality indicated.

EEE. RFI-Reply: A document consisting of supplementary details, instructions or information issued by the Architect/Engineer, which clarifies or supplements Contract Documents and with which Contractor shall comply. RFI-Replies do not constitute changes in Contract Sum or Contract Times except as otherwise agreed in writing by Owner. RFI-Replies will be issued through the RFI administrative system.

FFF. Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

GGG. Shop Drawings: All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the work.

HHH. Shown: As indicated on Drawings.
III. Site: The particular geographical location of Work performed pursuant to Contract, including staging areas, work areas, storage and lay down areas, access and parking.

JJJ. Specifications: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

KKK. Specified: As written in Specifications.

LLL. Subcontractor: A person or entity who has a direct contract with Contractor to perform a portion of the Work at the site. The term "subcontractor" is referred to throughout the Contract Documents as if singular in number and neuter in gender and means a subcontractor or an authorized representative of the subcontractor. The term "subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

MMM. Substantial Completion: The Work (or a specified part thereof) has progressed to the point where, in the opinion of the Architect/Engineer as evidenced by a Certificate of Substantial Completion, it is sufficiently complete, in accordance with Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work is complete and ready for final payment is evidenced by written recommendation of the Architect/Engineer for final payment. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

NNN. Supplemental Instruction: A written work change directive to Contractor from Architect/Engineer, approved by Architect, ordering alterations or modifications which do not result in change in Contract Sum or Contract Times, and do not substantially change Drawings or Specifications.

OOO. Underground Facilities: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: Electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

PPP. Work: The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all is required by the Contract Documents. Wherever the word "work" is used, rather than the word "Work", it shall be understood to have its ordinary and customary meaning.

1. Wherever words "as directed", "as required", "as permitted", or words of like effect are used, it shall be understood that direction, requirements, or permission of Owner or Architect is intended. Words "sufficient", "necessary", "proper", and the like shall mean sufficient, necessary or proper in judgment of Owner or Architect. Words "approved", "acceptable", "satisfactory", "favorably reviewed" or words of like import, shall mean approved by, or acceptable to, or satisfactory to, or favorably reviewed by Owner or Architect.

2. Wherever the word "may" is used, the action to which it refers is discretionary. Wherever the word "shall" is used, the action to which it refers is mandatory.
1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

D. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or laws or regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.

E. Except as otherwise specifically stated in the Contract Documents or as may be provided by Change Order, or supplemental instruction, the provisions of the Contract Documents shall take precedence in resolving conflicts, errors, ambiguity or discrepancy between the Contract Documents and:

1. The provisions of standards, specifications, manuals, codes, or instructions (whether or not specifically incorporated by reference in the Contract Documents); or

2. The provisions of laws or regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such law or regulation).

F. No provision of referenced standards, specifications, manuals, codes or instructions shall be effective to change the duties and responsibilities of Owner, Contractor or Architect/Engineer, or their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to Owner, Architect/Engineer or their consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

1.4 REPORTING AND RESOLVING DISCREPANCIES

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

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

4. AASHTO - American Association of State Highway and Transportation Officials; [www.transportation.org](http://www.transportation.org).
10. ACR - American Chemical Society; [www.acs.org](http://www.acs.org).
13. AIC - American Institute of Chemical Engineers; [www.aiche.org](http://www.aiche.org).
15. AIEE - American Institute of Electrical Engineers; [www.aiee.org](http://www.aiee.org).
17. AISH - American Institute of Steel Construction; [www.aisc.org](http://www.aisc.org).
28. ASCE - American Society of Civil Engineers; [www.asce.org](http://www.asce.org).
29. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; [www.asce.org](http://www.asce.org).
34. ASTM - ASTM International; [www.astm.org](http://www.astm.org).
36. AVIXA - Audiovisual and Integrated Experience Association; [former: Infocomm International]; [www.soundandcommunications.com](http://www.soundandcommunications.com).
40. AWPA - American Wood Protection Association; [www.awpa.com](http://www.awpa.com).
44. BHMA - Builders Hardware Manufacturers Association; [www.buildershardware.com](http://www.buildershardware.com).
45. BIA - Brick Industry Association (The); [www.gobrick.com](http://www.gobrick.com).
47. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); [www.bifma.org](http://www.bifma.org).
49. BWF - Badminton World Federation; (Formerly: International Badminton Federation); [www.bissc.org](http://www.bissc.org).
50. CDA - Copper Development Association; [www.copper.org](http://www.copper.org).
52. CEA - Canadian Electricity Association; [www.electricity.ca](http://www.electricity.ca).
53. CFFA - Chemical Fabrics and Film Association, Inc.; [www.chemicalfabricsandfilm.com](http://www.chemicalfabricsandfilm.com).
54. CFSEI - Cold-Formed Steel Engineers Institute; [www.cfsei.org](http://www.cfsei.org).
55. CGA - Compressed Gas Association; [www.cganet.com](http://www.cganet.com).
56. CIMA - Cellulose Insulation Manufacturers Association; [www.cellulose.org](http://www.cellulose.org).
60. CPA - Composite Panel Association; [www.compositepanel.org](http://www.compositepanel.org).
61. CRI - Carpet and Rug Institute (The); [www.carpet-rug.org](http://www.carpet-rug.org).
63. CRSI - Concrete Reinforcing Steel Institute; [www.crsi.org](http://www.crsi.org).
64. CSA - CSA Group; [www.csa-group.org](http://www.csa-group.org).
65. CSI - Construction Specifications Institute (The); [www.csiresources.org](http://www.csiresources.org).
68. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); [www.coolingtechnology.org](http://www.coolingtechnology.org).
69. CWC - Composite Wood Council; (See CPA).
70. DASMA - Door and Access Systems Manufacturers Association; [www.dasma.com](http://www.dasma.com).
71. DHA - Decorative Hardwoods Association; (Formerly: Hardwood Plywood & Veneer Association); [www.decorativehardwoods.org](http://www.decorativehardwoods.org).
72. DHI - Door and Hardware Institute; [www.dhi.org](http://www.dhi.org).
73. ECA - Electronic Components Association; (See ECIA).
74. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
75. ECIA - Electronic Components Industry Association; [www.eciaonline.org](http://www.eciaonline.org).
76. EIA - Electronic Industries Alliance; (See TIA).
77. EIMA - EIFS Industry Members Association; [www.eima.com](http://www.eima.com).
79. EOS/ESD Association; (Electrostatic Discharge Association); [www.esda.org](http://www.esda.org).
80. ESTA - Entertainment Services and Technology Association; (See PLASA).
81. ETL - Intertek (See Intertek); [www.intertek.com](http://www.intertek.com).
83. FCI - Fluid Controls Institute; [www.fluidcontrolsinstitute.org](http://www.fluidcontrolsinstitute.org).
84. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); [www.fiba.com](http://www.fiba.com).
85. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); [www.fivb.org](http://www.fivb.org).
86. FM Approvals - FM Approvals LLC; [www.fmglobal.com](http://www.fmglobal.com).
87. FM Global - FM Global; (Formerly: FMG - FM Global); [www.fmglobal.com](http://www.fmglobal.com).
88. FRSA - Florida Roofing, Sheet Metal Contractors Association, Inc.; [www.floridaroof.com](http://www.floridaroof.com).
89. FSA - Fluid Sealing Association; [www.fluidsealing.com](http://www.fluidsealing.com).
REFERENCES

91. GA - Gypsum Association; [www.gypsum.org](http://www.gypsum.org).
92. GANA - Glass Association of North America; (See NGA).
93. GS - Green Seal; [www.greenseal.org](http://www.greenseal.org).
94. HI - Hydraulic Institute; [www.pumps.org](http://www.pumps.org).
95. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
96. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
97. HPVA - Hardwood Plywood & Veneer Association; (See DHA).
98. HPW - H. P. White Laboratory, Inc.; [www.hpwhite.com](http://www.hpwhite.com).
100. IAS - International Accreditation Service; [www.iasonline.org](http://www.iasonline.org).
101. ICBO - International Conference of Building Officials; (See ICC).
103. ICEA - Insulated Cable Engineers Association, Inc.; [www.icea.net](http://www.icea.net).
104. ICPI - International Cast Polymer Alliance; [www.icpa-hq.org](http://www.icpa-hq.org).
105. ICRI - International Concrete Repair Institute, Inc.; [www.icri.org](http://www.icri.org).
107. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); [www.ieee.org](http://www.ieee.org).
108. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); [www.ies.org](http://www.ies.org).
109. IESNA - Illuminating Engineering Society of North America; (See IES).
110. IEST - Institute of Environmental Sciences and Technology; [www.iest.org](http://www.iest.org).
113. II - Infocomm International; (See AVIXA).
114. ILI - Indiana Limestone Institute of America, Inc.; [www.iliai.com](http://www.iliai.com).
115. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); [www.intertek.com](http://www.intertek.com).
116. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); [www.isa.org](http://www.isa.org).
117. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
118. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); [www.isfanow.org](http://www.isfanow.org).
120. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
121. ITU - International Telecommunication Union; [www.itu.int/home](http://www.itu.int/home).
122. KCMA - Kitchen Cabinet Manufacturers Association; [www.kcma.org](http://www.kcma.org).
123. LAMA - Laminating Materials Association; (See CPA).
125. MBMA - Metal Building Manufacturers Association; [www.mbma.com](http://www.mbma.com).
126. MCA - Metal Construction Association; [www.metalconstruction.org](http://www.metalconstruction.org).
130. MIA - Marble Institute of America; (See NSI).
131. MMPA - Moulding & Millwork Producers Association; [www.mmmpa.com](http://www.mmmpa.com).
132. MPI - Master Painters Institute; [www.paintinfo.com](http://www.paintinfo.com).
135. NACE - NACE International; (National Association of Corrosion Engineers International); [www.nace.org](http://www.nace.org).
REFERENCES

141. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
142. NCMA - National Concrete Masonry Association; www.ncma.org.
143. NEBB - National Environmental Balancing Bureau; www.nebb.org.
144. NECA - National Electrical Contractors Association; www.necanet.org.
146. NEMA - National Electrical Manufacturers Association; www.nema.org.
147. NETA - InterNational Electrical Testing Association; www.netaworld.org.
150. NFPA - NFPA International; (See NFPA).
152. NGA - National Glass Association (The); (Formerly: Glass Association of North America); www.glass.org.
155. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
158. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
160. NSI - National Stone Institute; (Formerly: Marble Institute of America); www.naturalstoneinstitute.org.
163. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
165. PCI - Precast/Prestressed Concrete Institute; www pci.org.
166. PDI - Plumbing & Drainage Institute; www.pdionline.org.
167. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
172. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
174. SDI - Steel Door Institute; www.steeldoorg.
175. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
176. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
178. SJIA - Steel Joist Institute; www.steeljoist.org.
179. SMA - Screen Manufacturers Association; www.smainfo.org.
180. SMACNA - Sheet Metal and Air Conditioning Contractors’ National Association; www.smacna.org.
181. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
182. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
REFERENCES

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up-to-date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
3. CDHS; California Department of Health Services; (See CDPH).
4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestservice.tamu.edu.
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:
   1. Section 01 1100 "Summary of Work" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

A. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.

C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.

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

F. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
5. Other dust-control measures.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails.

B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.

C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Store combustible materials apart from building.

2.3 EQUIPMENT

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

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
   2. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
   3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 7700 "Closeout Procedures."
C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
   1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner’s property.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
   1. Locate facilities to limit site disturbance as specified in Section 01 1000 “Summary of Work.”

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Connect to Owner’s existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
   1. Use of Permanent Toilets: Use of Owner’s existing or new toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from...
adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.

F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install WiFi cell phone access equipment and one land-based telephone line for each field office.

2. At each telephone, post a list of important telephone numbers.
   a. Police and fire departments.
   b. Ambulance service.
   c. Contractor's home office.
   d. Contractor's emergency after-hours telephone number.
   e. Architect's office.
   f. Engineers' offices.
   g. Owner's office.
   h. Principal subcontractors' field and home offices.

3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

I. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by Architect and Owner.

J. Project Computer: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications.

3.4 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.

2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.

2. Maintain access for fire-fighting equipment and access to fire hydrants.
C. Parking: Provide temporary parking areas for construction personnel.

D. Storage and Staging: Use designated areas of Project site for storage and staging needs.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.

F. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
   1. Identification Signs: Provide Project identification signs as indicated on Drawings.
   2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
      a. Provide temporary, directional signs for construction personnel and visitors.
   3. Maintain and touchup signs so they are legible at all times.

G. Waste Disposal Facilities: Comply with requirements specified in Section 01 7419 "Construction Waste Management and Disposal."

H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
   1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
   1. Comply with work restrictions specified in Section 01 1100 "Summary of Work."

C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
   1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
   2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
   3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
   4. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.
D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
   1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations or as indicated on Drawings otherwise.
   2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

H. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

J. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.

K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

L. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration.
   1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.

M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
   1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
   2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 MOISTURE AND MOLD CONTROL

A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

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

3.7 CONTINUITY OF SERVICES

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

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
   2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 7700 "Closeout Procedures."

- END OF SECTION -
PART 1 GENERAL

1.1 SUBMITTALS
A. See Section 013300 (Submittal Procedures).
B. Safety Program.
C. Fire Protection Plan.

1.2 PROTECTION
A. Continuously maintain protection as necessary to protect the Work, as a whole and in part, and adjacent property and improvements from accidents, injuries or damage.
B. Properly protect the Work:
   1) With lights, guard rails, temporary covers and barricades.
   2) Enclose excavations with proper barricades.
   3) Brace and secure all parts of the Work against storm and accident.
   4) Provide such additional forms of protection that may be necessary under existing circumstances.
C. Provide and maintain in good condition all protective measures required to adequately protect the public from hazards resulting from the Work and to exclude unauthorized persons from the Work. When regulated by Building Code, Cal OSHA, or other authority, such legal requirements for protection shall be considered as minimum requirements. Be responsible for the protection in excess of such minimum requirements as required.
D. Related Sections:
   1) Section 015000 - Temporary Facilities and Controls

1.3 CONTROL OF SITE
A. Contractor shall be responsible for securing the project Site (the fence, area within the fence, and the building) to:
   1) Provide site security to assure that no member of the public is able to gain access to the work area at any time. Contractor shall maintain access and egress routes at all times.
   2) Secure, maintain, and protect the building, its contents, the Work, stored materials, equipment and temporary facilities until time of acceptance, or such earlier time as Library may choose to assume such responsibility. Security and protection may be by any legal method, or methods, acceptable to Library.
   3) At Contractor's option, provide a night security guard during all hours that Contractor is not physically in control of the site through its performance of the Work.
B. Ensure that no alcohol, firearms, weapons, or controlled substance enters or is used at the Site. Immediately remove from the Site and terminate the employment of any employee found in violation of this provision.

1.4 SAFETY PROGRAM
A. Prior to starting any Work at the Site, submit a Safety Program that has been reviewed and approved by an Industrial Hygienist certified by the American Board of Industrial Hygiene or a Certified Safety Professional. The Safety Program shall include the name, certification number, and certification seal of the Industrial Hygienist or Certified Safety Professional. Comply with the Safety Program and all applicable federal, state, and local regulation codes, rules, law and ordinances.
B. Receipt and/or review of the Safety Program by Library, Architect, Engineer or Library's Representative shall not relieve Contractor of any responsibility for complying with all applicable safety regulations.
C. It is essential that Contractor and each Subcontractor implement an effective and vigorous Safety and Health Program to cover their respective portions of the Work. Subject to Contractor's overall responsibility for Project safety, it shall be understood that
the full responsibility for providing a safe place to work with respect to their respective portions of the Work rests with each individual Contractor and Subcontractor.

D. Safety Program components:
   1) Injury and Illness Prevention Program (IIPP): Conforming to the General Industrial Safety Orders (CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 3203), and the California Labor Code (Section 6401.7).
   2) Site-Specific Safety and Health Plan (SSHP): Describing health and safety procedures that shall be implemented during the Work in order to ensure safety of the public and those performing the Work. Follow the guidelines for a SSHP listed in CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 5192, Item (b)(4) f.
E. The wearing of hard hats shall be mandatory at all times for personnel on Site. Supply sufficient hard hats to equip properly all employees and visitors.
F. Whenever an exposure exists, appropriate personal protective equipment (PPE) shall be used by all affected personnel. Supply PPE to all personnel under Contractor's direction.
G. Submit three (3) copies of Safety Program specific to these Contract Documents to Library within the time set forth in Section 01540 (Site Security and Safety), paragraph 1.4.

1.5 SAFETY REQUIREMENTS
A. Standards: Maintain the Project in accordance with state and local safety and insurance standards.
B. Hazards Control:
   1) Store volatile wastes in covered metal containers and remove from premises daily.
   2) Prevent accumulation of wastes that create hazardous conditions.
   3) Provide adequate ventilation during use of volatile or noxious substances.
C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
   1) Do not burn or bury rubbish or waste material on the Site.
   2) Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
   3) Do not dispose of wastes into streams or waterways.
D. Provide accident information on the forms provided by Contractor. This information shall be provided on the same Day as the occurrence of said incident.
E. Coordinate emergency vehicle access route to the site with the City of Petaluma Fire Department. Emergency vehicle access route to be maintained at all times during the project as required by the City of Petaluma Fire Department.

1.6 SITE SAFETY OFFICER
A. Designate one of Contractor's staff as "Site Safety Officer" whose duties shall include the responsibility for enforcing the environmental protection provisions of the Contract Documents including safety and health, the requirements of the Occupational Safety and Health Act, and other applicable federal, state and local standards. Submit for review by Library Contractor's intended traffic flow plan, security plan, program for temporary structures, housecleaning plan, demolition program, and environmental safety and health plan. After review by Library, the implementation and enforcement of these plans shall become the responsibility of the Site Safety Officer. Any changes in the plans shall be requested by Contractor through the Site Safety Officer for written concurrence by Library.
B. Library’s representatives shall be allowed access to accident/injury and illness reports, inspection reports, scheduling and construction meetings, and safety meetings.

1.7 FIRE PROTECTION PLAN
A. Prior to starting any work that includes combustible materials at the Site, submit one (1) copy of a fire protection plan that has been reviewed and approved by the City of Santa Rosa Fire Department to Library Project Manager. It is recommended that the plan include, but not be limited to, a discussion of the following items:
   1) Equipment spark arresters
2) Fire-extinguishing equipment on hand
3) Method of operation in case of fire
4) Notification to authorities of any fire
5) Access available during performance of Work
6) Educating workers of fire protection plan

1.8 SHORING SAFETY PLAN
A. Any conflict between this paragraph 1.8 and Division 2 of the Specifications shall be resolved in favor of the most stringent requirement.
B. At least five (5) Days in advance of any excavation five feet or more in depth, Contractor shall submit to Library a detailed plan showing the shoring, bracing and sloping design (including calculations) and other provisions to be made for worker protection from the hazard of caving ground during the excavation, as required by Labor Code Section 6705. A civil or structural engineer registered in California shall prepare and sign any plan that varies from the shoring system standards established by the State Construction Safety Orders.
C. During the course of Work, Contractor shall be responsible for determining where sloping, shoring, and/or bracing is necessary and the adequacy of the design, installation, and maintenance of all shoring and bracing for all excavation, including any excavation less than five feet in depth. Contractor will be solely responsible for any damage or injuries that may result from excavating or trenching. Library’s acceptance of any drawings showing the shoring or bracing design or Work schedule shall not relieve Contractor of its responsibilities under this paragraph 1.8.
D. Contractor shall appoint a qualified supervisory employee who shall be responsible to determine the sloping or shoring system to be used depending on local soil type, water table, stratification, depth, etc.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:
   1. Section 01 2500 "Substitution Procedures" for requests for substitutions.
   2. Section 01 4200 "References" for applicable industry standards for products specified.
   3. Section 01 7700 "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
   3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model
number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
   1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
   2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.

E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 01 3300 "Submittal Procedures."

F. Substitution: Refer to Section 01 2500 "Substitution Procedures" for definition and limitations on substitutions.

1.4 QUALITY ASSURANCE

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

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that 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 following installation, on a visually accessible surface that is not conspicuous.
   2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
      a. Name of product and manufacturer.
      b. Model and serial number.
      c. Capacity.
d. Speed.
e. Ratings.

3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

1.5 COORDINATION

A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

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

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

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

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.

2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
   1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
   2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
   3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 7700 "Closeout Procedures."

**PART 2 - PRODUCTS**

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
   1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
   2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
   3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
   4. Where products are accompanied by the term "as selected," Architect will make selection.
   6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
      a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the Architect, whose determination is final.

B. Product Selection Procedures:
   1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
      a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."
2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
   a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."

3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
   a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."

4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.
   a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
   b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.

5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
   a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."

6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.
   a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
   b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.

7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
   a. For approval of products by unnamed manufacturers, comply with requirements in Section 01 2500 "Substitution Procedures" for substitutions for convenience.

C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 2500 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

E. Sustainable Product Selection: Where Specifications require product to meet sustainable product characteristics, select products complying with indicated requirements. Comply with requirements in Division 01 sustainability requirements Section and individual Specification Sections.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.

2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.

3. Evidence that proposed product provides specified warranty.

4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.

5. Samples, if requested.

B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Section 01 3300 "Submittal Procedures."

1. Form of Approval of Submittal: As specified in Section 01 3300 "Submittal Procedures."

2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

C. Submittal Requirements, Two-Step Process: Approval by the Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

2.3 PRODUCT REQUIREMENTS

A. Salient Physical Attributes: Physical and other characteristics of products which may not be individually noted in the specifications are essential parts of the product specification. Products shall possess all attributes set forth in the manufacturer's catalog description for the specified item, except for such modifications thereto as may be indicated in the Contract Documents. Such attributes include:
1. Size: Dimensions, Form Factor (relative proportions of height, width, depth), Configuration. Ability to fit in space provided, without change to other assemblies or systems, set in place for use without reconfiguration.

2. Capacity: Ability to fulfill specified requirements.

3. Weight: Ability to be supported and braced by structure as shown.

4. Physical arrangement of connections or ports: Intakes, exhausts, utility connections and other such items; their dimensions, form factors and relative proportions. Connect to other systems, ductwork, utilities, controls without changes to other systems.

5. Required Clearances: Vertical, horizontal, to other equipment or construction, other similar attributes.

B. Proprietary Names, Catalog Numbers and Identification: These attributes may be included for convenience in identifying products. Unless modified by Specifications or notation on Drawings, manufacturer's complete product catalog description for indicated product name or number shall constitute requirements for each product as if fully included in the product specification. Products shall incorporate all features set forth in the manufacturer's catalog description for the standard item, except for such modifications thereto as may be indicated in the Contract Documents.

C. Proprietary names, catalog numbers, and specific requirements as may be set forth, are given to establish standard of design and quality for materials, construction and workmanship. Use of this information to identify products is not intended to preclude use of alternate products by other manufacturers, except as specified in that given section.

D. Manufacturer’s Requirements: All deviations from design requirements shown or specified, resulting either from Contractor’s or supplier’s change of model, or manufacturer’s recommendation, or from submitted alternates or accepted substitutions, shall be clearly indicated on the Contractor's submittals. Contractor shall provide all such manufacturer or supplier supplemental requirements at no additional cost.

**PART 3 - EXECUTION (NOT USED)**

**- END OF SECTION -**
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. VOC restrictions for product categories listed below under "DEFINITIONS."
   1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

B. All products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.

C. Listing of a product in these specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No. 1168, as described in Rule 1168(g).
   1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
   2. Do not use products which do not meet the requirements of this rule.

1.3 RELATED REQUIREMENTS

A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this section.

B. Section 01 8113 "Sustainable Design Requirements".

1.4 DEFINITIONS

A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site:
   1. Adhesives, sealants, and sealer coatings, regardless of specification section or division.
   2. Paints and coatings.
3. Carpet and resilient flooring.
4. Composite wood products; plywood, particleboard, wood fiberboard.

B. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

C. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 REFERENCES
A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CAL-Green”.
B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; Current Edition.
D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; Current Edition.
E. GEI (SCH) - GREENGUARD "Children and Schools” Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.
F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.
H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scscertified.com.

1.6 SUBMITTALS
A. See Section 01 3300 - Submittals Procedures.
B. Evidence of Compliance: Submit for each different product in each applicable category.
   1. Identify evidence submittals with the words "CAL-Green VOC Compliance Report".
C. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
D. Installer Certifications for Accessory Materials: Require each installer of any type of product, (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.
   1. Use the form following this section for installer certifications.
1.7 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No. 1168 and less where required by code.

1. These products may be specified in multiple sections throughout these specifications.

B. Adhesives, including carpet: Comply with Title 24, Part 11, Table 5.504.4.1.

1. Evidence of Compliance: Acceptable types of evidence are:
   a. Report of laboratory testing performed in accordance with requirements.
   b. Published product data showing compliance with requirements.
   c. Certification by manufacturer that product complies with requirements.

C. Joint Sealants: Comply with Title 24, Part 11, Table 5.504.4.2.

1. Evidence of Compliance: Acceptable types of evidence are:
   a. Report of laboratory testing performed in accordance with requirements.
   b. Published product data showing compliance with requirements.
   c. Certification by manufacturer that product complies with requirements.

D. Aerosol Adhesives: Comply with Title 24, Part 11, Table 5.504.4.1. and California Code of Regulations Title 17, Section 94507.

1. Evidence of Compliance: Acceptable types of evidence are:
   a. Current GreenSeal Certification.
   b. Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
   c. Published product data showing compliance with requirements.

E. Paints and Coatings: Comply with Title 24, Part 11, Table 5.504.4.3; California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.

1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

   a. Evidence of Compliance: Acceptable types of evidence are:
      1) Report of laboratory testing performed in accordance with requirements.
      2) Published product data showing compliance with requirements.
      3) Certification by manufacturer that product complies with requirements.

2. Provide coatings that comply with the most stringent requirements specified in the following:

b. South Coast Air Quality Management District Rule No.1168.

F. Carpet: Comply with Title 24, Part 11, 5.504.4.4; meet testing and product requirements of one of the following:
   1. Carpet & Rug Institute “Green Label Plus”.
   2. California Department of Public Health Standard Practice for testing of VOC’s (Specification 01350).
   3. NSF/ANSI 140 at Gold Level.
   5. All carpet cushion installed shall meet requirements of Carpet & Rug Institute “Green Label Program”.
   6. All carpet cushion installed shall meet requirements of Title 24, Part 11, Table 5.504.4.1.

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

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>CURRENT LIMIT (JULY 1, 2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardwood Plywood veneer core</td>
<td>0.05</td>
</tr>
<tr>
<td>Hardwood Plywood composite core</td>
<td>0.05</td>
</tr>
<tr>
<td>Particleboard</td>
<td>0.09</td>
</tr>
<tr>
<td>Medium Density Fiberboard</td>
<td>0.11</td>
</tr>
<tr>
<td>Thin Medium Density Fiberboard</td>
<td>0.13</td>
</tr>
</tbody>
</table>

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

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

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

3.2 RESTRICTED COMPONENTS

A. Restricted Components:
1. Paints and coatings shall not contain any of the following:
   a. Acrolein.
   b. Acrylonitrile.
   c. Antimony.
   d. Benzene.
   e. Butyl benzyl phthalate.
   f. Cadmium.
   g. Di (2-ethylhexyl) phthalate.
   h. Di-n-butyl phthalate.
   i. Di-n-octyl phthalate.
   j. 1,2-dichlorobenzene.
   k. Diethyl phthalate.
   l. Dimethyl phthalate.
   m. Ethylbenzene.
   n. Formaldehyde.
   o. Hexavalent chromium.
   p. Isophorone.
   q. Lead.
   r. Mercury.
   s. Methyl ethyl ketone.
   t. Methyl isobutyl ketone.
   u. Methylene chloride.
   v. Naphthalene.
   w. Toluene (methylbenzene).
   x. 1,1,1-trichloroethane.
   y. Vinyl chloride.

3.3 ADHESIVES AND SEALANTS

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

<table>
<thead>
<tr>
<th>Architectural Applications</th>
<th>Current VOC Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor Carpet Adhesives</td>
<td>50</td>
</tr>
<tr>
<td>Carpet Pad Adhesives</td>
<td>50</td>
</tr>
<tr>
<td>Outdoor Carpet Adhesives</td>
<td>150</td>
</tr>
</tbody>
</table>

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS
<table>
<thead>
<tr>
<th>Specialty Applications</th>
<th>Current VOC Limit</th>
<th>1-1-05</th>
<th>7-1-05</th>
<th>1-1-07</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC Welding</td>
<td>510</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPVC Welding</td>
<td>490</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABS Welding</td>
<td>400</td>
<td></td>
<td></td>
<td>325</td>
</tr>
<tr>
<td>Plastic Cement Welding</td>
<td>350</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adhesive Primer for Plastic</td>
<td>650</td>
<td></td>
<td></td>
<td>550</td>
</tr>
<tr>
<td>Computer Diskette Manufacturing</td>
<td>350</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact Adhesive</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Purpose Contact Adhesive</td>
<td>250</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tire Retread</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adhesive Primer for Traffic Marking Tape</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structural Wood Member Adhesive</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheet Applied Rubber Lining Operations</td>
<td>850</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top and Trim Adhesive</td>
<td>540</td>
<td></td>
<td></td>
<td>250</td>
</tr>
</tbody>
</table>

** The specified limits remain in effect unless revised limits are listed in subsequent columns.

Table 5.504.4.1 Continued

For adhesives, adhesive bonding primers, or any other primer not regulated by the above two tables and applied to the following substrates, the following limits shall apply:

<table>
<thead>
<tr>
<th>Substrate Specific Applications</th>
<th>Current VOC Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal to Metal</td>
<td>30</td>
</tr>
<tr>
<td>Plastic Foams</td>
<td>50</td>
</tr>
<tr>
<td>Porous Material (except wood)</td>
<td>50</td>
</tr>
<tr>
<td>Wood</td>
<td>30</td>
</tr>
<tr>
<td>Fiberglass</td>
<td>80</td>
</tr>
</tbody>
</table>
### Table 5.504.4.2 SEALANT VOC LIMIT

If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.

<table>
<thead>
<tr>
<th>Sealant</th>
<th>Current VOC Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural</td>
<td>250</td>
</tr>
<tr>
<td>Marine Deck</td>
<td>760</td>
</tr>
<tr>
<td>Nonmembrane Roof</td>
<td>300</td>
</tr>
<tr>
<td>Roadway</td>
<td>250</td>
</tr>
<tr>
<td>Single-Ply Roof Membrane</td>
<td>450</td>
</tr>
<tr>
<td>Other</td>
<td>420</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sealant Primers</th>
<th>Current VOC Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural</td>
<td></td>
</tr>
<tr>
<td>Non Porous</td>
<td>250</td>
</tr>
<tr>
<td>Porous</td>
<td>775</td>
</tr>
<tr>
<td>Modified Bituminous</td>
<td>500</td>
</tr>
<tr>
<td>Marine Deck</td>
<td>760</td>
</tr>
<tr>
<td>Other</td>
<td>750</td>
</tr>
</tbody>
</table>

For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material as determined in paragraph (b)(32); for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as determined in paragraph (b)(31).
3.4 PAINTS AND COATINGS

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

<table>
<thead>
<tr>
<th>COATING CATEGORY</th>
<th>Current VOC Limit 1/1/2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat Coatings</td>
<td>50</td>
</tr>
<tr>
<td>Nonflat Coatings</td>
<td>100</td>
</tr>
<tr>
<td>Nonflat High Gloss Coatings</td>
<td>150</td>
</tr>
<tr>
<td>Specialty Coatings</td>
<td></td>
</tr>
<tr>
<td>Aluminum Roof Coatings</td>
<td>400</td>
</tr>
<tr>
<td>Basement Specialty Coatings</td>
<td>400</td>
</tr>
<tr>
<td>Bituminous Roof Coatings</td>
<td>50</td>
</tr>
<tr>
<td>Bituminous Roof Primers</td>
<td>350</td>
</tr>
<tr>
<td>Bond Breakers</td>
<td>350</td>
</tr>
<tr>
<td>Concrete Curing Compounds</td>
<td>350</td>
</tr>
<tr>
<td>Concrete / Masonry Sealers</td>
<td>100</td>
</tr>
<tr>
<td>Driveway Sealers</td>
<td>50</td>
</tr>
<tr>
<td>Dry Fog Coatings</td>
<td>150</td>
</tr>
<tr>
<td>Faux Finishing Coatings</td>
<td>350</td>
</tr>
<tr>
<td>Fire Resistive Coatings</td>
<td>350</td>
</tr>
<tr>
<td>Floor Coatings</td>
<td>100</td>
</tr>
<tr>
<td>Form-Release Compounds</td>
<td>250</td>
</tr>
<tr>
<td>Graphic Arts Coatings (Sign Paints)</td>
<td>500</td>
</tr>
<tr>
<td>High-Temperature Coatings</td>
<td>420</td>
</tr>
<tr>
<td>Industrial Maintenance Coatings</td>
<td>250</td>
</tr>
<tr>
<td>Low Solids Coatings (See Note 1 below)</td>
<td>120</td>
</tr>
<tr>
<td>Magnesite Cement Coatings</td>
<td>450</td>
</tr>
<tr>
<td>Mastic Texture Coatings</td>
<td>100</td>
</tr>
<tr>
<td>Metallic Pigmented Coatings</td>
<td>500</td>
</tr>
<tr>
<td>Multicolor Coatings</td>
<td>250</td>
</tr>
<tr>
<td>Pretreatment Wash Primers</td>
<td>420</td>
</tr>
<tr>
<td>Primers, Sealer and Undercoaters</td>
<td>100</td>
</tr>
<tr>
<td>Reactive Penetrating Sealers</td>
<td>350</td>
</tr>
<tr>
<td>Recycled Coatings</td>
<td>250</td>
</tr>
<tr>
<td>Roof Coatings</td>
<td>50</td>
</tr>
<tr>
<td>Rust Preventative Coatings</td>
<td>250</td>
</tr>
<tr>
<td>Shellacs:</td>
<td></td>
</tr>
<tr>
<td>Clear</td>
<td>730</td>
</tr>
<tr>
<td>Opaque</td>
<td>550</td>
</tr>
<tr>
<td>Specialty Primers, Sealer and Undercoaters</td>
<td>100</td>
</tr>
<tr>
<td>Stains</td>
<td>250</td>
</tr>
</tbody>
</table>
### Table 5.504.4.3 Continued

<table>
<thead>
<tr>
<th>Material</th>
<th>VOC Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone Consolidants</td>
<td>450</td>
</tr>
<tr>
<td>Swimming Pool Coatings</td>
<td>340</td>
</tr>
<tr>
<td>Traffic Marking Coatings</td>
<td>100</td>
</tr>
<tr>
<td>Waterproofing Membranes</td>
<td>250</td>
</tr>
<tr>
<td>Wood Coatings</td>
<td>275</td>
</tr>
<tr>
<td>Wood Preservatives</td>
<td>350</td>
</tr>
<tr>
<td>Zinc Rich Primers</td>
<td>340</td>
</tr>
</tbody>
</table>

**Note 1:** Grams of VOC per liter of coating including water and including exempt compounds.

**Note 2:** Not Applicable.

**Note 3:** Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.

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END OF SECTION

Installer Certification Form Follows
ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:
1. Project Name: ____________________________________________________________
2. Project No.: ____________________________________________________________
3. Architect: ______________________________________________________________

USE OF THIS FORM:
4. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
5. Contractor is required to obtain and submit this form from each installer of work on this project.
6. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
7. If any of these accessory materials has been used, attach to this form product data and MSDS sheet for each such product.
8. VOC content restrictions are specified in Section 01 6116.

PRODUCT CERTIFICATION

I certify that the installation work of my firm on this project:
9. [HAS] [HAS NOT] required the use of any ADHESIVES.
10. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
11. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
12. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

Product data and MSDS sheets are attached.

CERTIFIED BY: (INSTALLER/MANUFACTURER/SUPPLIER FIRM)

Firm Name: _______________________________________________________________________

Print Name: _______________________________________________________________________

Signature: _________________________________________________________________________

Title: ____________________________________________________________ (officer of company)

Date: ____________________________________________________________________________

- END OF SECTION -

VOLATILE ORGANIC COMPOUND (VOC) RESTRICTIONS

01 6116 - 10
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
   2. Installation of the Work.
   3. Cutting and patching, as required to:
      a. Make the several parts fit properly.
      b. Uncover work to provide for installation, inspection, or both of ill-timed work.
      c. Remove and replace work non-conforming or defective work.
   4. Coordination of Owner-installed products.
   5. Progress cleaning.
   6. Starting and adjusting.
   7. Protection of installed construction.

B. Related Requirements:
   1. Section 01 1000 "Summary of Work" for limits on use of Project site.
   2. Section 01 7700 "Closeout Procedures" for final cleaning.
   3. Section 02 4119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.
1.4 INFORMATIONAL SUBMITTALS

A. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
   1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
   2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
   3. Products: List products to be used for patching and firms or entities that will perform patching work.
   4. Dates: Indicate when cutting and patching will be performed.
   5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
      a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

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

1.5 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

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

k. Electrical wiring systems.

l. Operating systems of special construction.

m. Operating systems critical to the function of the facility.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

a. Water, moisture, or vapor barriers, including roofing.

b. Membranes and flashings.

c. Exterior curtain-wall construction.

d. Sprayed fire-resistive material.

e. Equipment supports.

f. Piping, ductwork, vessels, and equipment.

g. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.
2.2 **FABRICATION**

A. Curved Construction: Where curved construction is shown, provide true curves minimizing joints. Segmented fabrication not allowed.
   1. Machine-roll components or elements required to be curved or “radiused”.
   2. Do not field bend or "walk-down".

### PART 3 - EXECUTION

3.1 **EXAMINATION**

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services, and other utilities.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
   2. List of detrimental conditions, including substrates.
   3. List of unacceptable installation tolerances.
   4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 **PREPARATION**

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility
appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 01 3100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to existing conditions. If discrepancies are discovered, notify Architect promptly.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
   4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces, unless otherwise indicated on Drawings or related specifications.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

J. Grind or bush split-faced or textured masonry to achieve hairline fit to adjacent trim, flashings, inserts, escutcheons or other penetrating elements.

K. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 1000 "Summary of Work."

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer’s written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finshed Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.

5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

6. Proceed with patching after construction operations requiring cutting are complete.

H. Discrepancies:

1. If uncovered conditions are not as anticipated, immediately notify the Architect through the Owner’s Representative and secure needed directions.

2. Do not proceed in areas of discrepancy until all such discrepancies have been fully resolved.

I. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

   a. Clean piping, conduit, and similar features before applying paint or other finishing materials.

   b. Restore damaged pipe covering to its original condition.

3. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a natural line of division and make recommendation to Architect.

4. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

   a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.

5. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
6. Exterior Building Enclosure: Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces. Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

J. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
   2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
      a. Use containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 7419 "Construction Waste Management and Disposal."

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

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 4000 "Quality Requirements."

3.8 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 EXISTING UTILITY CONTINUITY

A. Examine and test existing building systems and utilities with components requiring relocation during performance of this work. Examples may include but are not limited to:
   1. Mechanical Systems
   2. Plumbing Systems
   3. Electrical Systems, line voltage, low voltage, signal alarm, or data.
   4. Fiber-optic data or communication cabling systems.

B. Remove or relocate these components while work is performed.
   1. Fiber-optic data cabling systems are extremely fragile and subject to mechanical damage. Relocate these systems with great care. Do not disconnect or remove these systems, which must remain in place and in operation during the Work.

C. Restore these components to the former location upon completion of the Work.

D. Test systems under provisions of related sections specifying start-up and adjusting to confirm proper operation. Conduct tests in the presence of the Architect and Owner’s Representative.

E. Perform remedial work as necessary to establish proper operation. Assume responsibility for proper operation of systems following completion of Work.
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes administrative and procedural requirements for the following:
   1. Progress (Daily) and Final Cleaning
   2. Disposing of nonhazardous construction and demolition waste.
   4. Recycling non-hazardous demolition and construction waste.

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

1.4 PROJECT CONDITIONS
A. Comply fully with Federal and local environmental and antipollution regulations.
   1. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.
   2. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

1.5 DEFINITIONS
A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.6 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 7 days of date established for the Notice of Award.

1.7 INFORMATIONAL SUBMITTALS

A. Demonstrate compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CAL-Green” 5.408.2, to the satisfaction of the enforcing agency.

1. Landfill Disposal Records: Indicate receipt and acceptance of waste by landfills and facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

2. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

B. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

C. Submit with all pay applications, certification letter, waste management log and receipts from all recycled and waste off-haul. Certification letter to state that under the penalty of perjury all materials removed from site during the billing period are included within the attached receipts and provide summary. Project inspector to verify all loads prior to off-haul and initial receipts prior to submitting with pay application. Failure to submit documentation with pay application shall prohibit processing of pay application.

1.8 PERFORMANCE REQUIREMENTS

A. General: Recycle or salvage for reuse a minimum of 65 percent of non-hazardous construction and demolition debris, or meet a local construction and demolition waste ordinance, whichever is more stringent.

1. Calculate the amount of materials diverted by weight or volume, but not both.

2. Exceptions: Excavated soil and land clearing debris, as specified below.

3. Alternate waste reduction methods developed in cooperation with local agencies if diversion or recycle facilities capable of compliance with CAL-Green requirements do not exist within the haul boundary of the jobsite (California Code of Regulations, Title 24, Part 11, 4.408.3).
B. Excavated Soil and Land Clearing Debris: Recycle or salvage for reuse 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing activities.

C. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials:

1.9 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

1.10 WASTE MANAGEMENT PLAN

A. Implement a construction waste management plan that complies with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CAL-Green” 5.408.2:

1. Identifies materials to be diverted from disposal by efficient usage, recycling, reuse on the project, or salvage for future use or sale.
2. Determines if materials will be sorted on-site or mixed.
3. Identifies diversion facilities where material collected will be taken.
4. Specifies that quantities of diverted material will calculated by weight or volume, but not both.

PART 2 - PRODUCTS

2.1 FIRE PROTECTION

A. Store volatile waste in covered metal containers.

B. Remove volatile waste from premises daily.

2.2 CLEANING MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning materials only on surfaces recommended by cleaning material manufacturer or by the manufacturer of surface to be cleaned.

B. Use cleaning products that comply with Green Seal’s GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.
PART 3 - EXECUTION

3.1 CLEANING - GENERAL

A. Progress (Daily) and Final Cleaning are specified in related sections.

B. Clean all items installed under this Contract.
   1. Leave free of stains, damage, or other defects prior to final acceptance.
   2. Include washing, sweeping, polishing of all finished wall surfaces, floors, windows,
   3. Replace damaged or defaced items not acceptable to Architect/Construction Manager to
      his/ her satisfaction at no additional expense to Owner.

C. Clean Site; mechanically sweep-paved areas.

D. Remove waste and surplus materials, rubbish, and construction facilities from Site.

E. See Technical Sections for additional cleaning requirements.

3.2 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage,
   signage, transportation, and other items as required to implement waste management plan during
   the entire duration of the Contract.
   1. Comply with Division 01 Section "Temporary Facilities and Controls" for operation,
      termination, and removal requirements.

B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures,
   as appropriate for the Work occurring at Project site.
   1. Distribute waste management plan to everyone concerned within three days of submittal
      return.
   2. Distribute waste management plan to entities when they first begin work on-site. Review
      plan procedures and locations established for salvage, recycling, and disposal.

C. Site Access and Temporary Controls: Conduct waste management operations to ensure
   minimum interference with roads, streets, walks, walkways, and other adjacent occupied and
   used facilities.
   1. Designate and label specific areas on Project site necessary for separating materials that
      are to be salvaged, recycled, reused, donated, and sold.
   2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust
      and dirt, environmental protection, and noise control.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE

A. General: Recycle paper and beverage containers used by on-site workers.

B. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling
   or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum
   contamination, and other substances deleterious to the recycling process.
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 according to approved construction waste management plan.

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.

3.4 DISPOSAL OF WASTE

A. Comply with local construction and demolition waste recycling ordinances.

Burning: Do not burn waste materials.

-END OF SECTION-
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Substantial Completion procedures.
   2. Final completion procedures.
   3. Warranties.
   4. Final cleaning.
   5. Repair of the Work.

1.3 RELATED REQUIREMENTS

A. Section 01 7300 "Execution" for progress cleaning of Project site.

B. Section 01 7823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

C. Section 01 7839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.4 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

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

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

1.5 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.
B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

D. Affidavit of Release of Liens: Document 006400 (Affidavit of Release of Liens Form) must be completed and executed by Contractor and Library, and a fully-executed copy provided to Library.

E. Warranty Form: Document 006536 (Warranty Form) must be completed by Contractor and provided to Library.

1.6 MAINTENANCE MATERIAL SUBMITTALS

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

1.7 SUBSTANTIAL COMPLETION PROCEDURES

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

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

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.

3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
   a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

5. Submit test/adjust/balance records.

6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

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

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
6. Advise Owner of changeover in heat and other utilities.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

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

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

1.8 FINAL COMPLETION PROCEDURES

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

1. Submit a final Application for Payment according to Section 01 2900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.

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

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
1.9 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

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

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

2. Include the following information at the top of each page:
   a. Project name.
   b. Date.
   c. Name of Architect.
   d. Name of Contractor.
   e. Page number.

3. Submit list of incomplete items in the following format:

1.10 SUBMITTAL OF PROJECT WARRANTIES

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

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 inch x 11 inch (215 mm x 280 mm) paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Remove tools, construction equipment, machinery, and surplus material from Project site.

d. Clean exposed exterior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

f. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.

g. Remove labels that are not permanent.

h. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

i. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

j. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
k. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

l. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.

m. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 01 5000 "Temporary Facilities and Controls." Prepare written report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 7419 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

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

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

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

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

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

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

- END OF SECTION -
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation and maintenance documentation directory.
   2. Emergency manuals.
   3. Operation manuals for systems, subsystems, and equipment.
   4. Product maintenance manuals.
   5. Systems and equipment maintenance manuals.

1.3 RELATED REQUIREMENTS
A. Section 01 3300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

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

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

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing
   demonstration and training. Architect and Commissioning Authority will comment on whether
   general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for
   Substantial Completion and at least 15 days before commencing demonstration and training.
   Architect and Commissioning Authority will return copy with comments.
   1. Correct or revise each manual to comply with Architect's and Commissioning Authority's
      comments. Submit copies of each corrected manual within 15 days of receipt of
      Architect's and Commissioning Authority's comments and prior to commencing
      demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance
   data and materials, listing items and their location to facilitate ready access to desired information.
   Include a section in the directory for each of the following:
   1. List of documents.
   2. List of systems.
   3. List of equipment.
   4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and
   maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For
   pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance
   manual.

E. Identification: In the documentation directory and in each operation and maintenance manual,
   identify each system, subsystem, and piece of equipment with same designation used in the
   Contract Documents. If no designation exists, assign a designation according to
   ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building
   Systems."
2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE/manuals

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of contents.

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.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
   1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
   2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:
   1. Type of emergency.
   2. Emergency instructions.
   3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
1. Fire.
2. Flood.
5. Power failure.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner’s operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:
   1. Instructions on stopping.
   2. Shutdown instructions for each type of emergency.
   3. Operating instructions for conditions outside normal operating limits.
   4. Required sequences for electric or electronic systems.
   5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
   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.
   7. Seasonal and weekend operating instructions.
   8. Required sequences for electric or electronic systems.
   9. Special operating instructions and procedures.

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

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

2.5 PRODUCT MAINTENANCE MANUALS

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

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

C. Product Information: Include the following, as applicable:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
   1. Inspection procedures.
   2. Types of cleaning agents to be used and methods of cleaning.
   3. List of cleaning agents and methods of cleaning detrimental to product.
   4. Schedule for routine cleaning and maintenance.
   5. Repair instructions.
E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

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

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
   1. Standard maintenance instructions and bulletins.
   2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
   3. Identification and nomenclature of parts and components.
   4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
   1. Test and inspection instructions.
   2. Troubleshooting guide.
   3. Precautions against improper maintenance.
   4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   5. Aligning, adjusting, and checking instructions.
   6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
   1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
   2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

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

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
   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.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
   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.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
   1. Do not use original project record documents as part of operation and maintenance manuals.
   2. Comply with requirements of newly prepared record Drawings in Section 01 7839 "Project Record Documents."

F. Comply with Section 01 7700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.
- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Product Data.
   4. Miscellaneous record submittals.

B. Related Requirements:
   1. Section 01 7300 "Execution" for final property survey.
   2. Section 01 7700 "Closeout Procedures" for general closeout procedures.
   3. Section 01 7823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Number of Copies: Submit copies of record Drawings as follows:
      a. Initial Submittal:
         1) Submit PDF electronic files of scanned record prints and one set of file prints.
         2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
      b. Final Submittal:
         1) Submit PDF electronic files of scanned record prints and three set(s) of prints.
         2) Print each drawing, whether or not changes and additional information were recorded.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
   1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

E. Reports: Submit written report weekly indicating items incorporated into Project Record Documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.4 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
   1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
      a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
      b. Accurately record information in an acceptable drawing technique.
      c. Record data as soon as possible after obtaining it.
      d. Record and check the markup before enclosing concealed installations.
      e. Cross-reference record prints to corresponding archive photographic documentation.

   2. Content: Types of items requiring marking include, but are not limited to, the following:
      a. Dimensional changes to Drawings.
      b. Revisions to details shown on Drawings.
      c. Depths of foundations 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 orders.
      l. Details not on the original Contract Drawings.
      m. Field records for variable and concealed conditions.
      n. Record information on the Work that is shown only schematically.

   3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

   4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Annotated PDF electronic file with comment function enabled.

2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.

3. Refer instances of uncertainty to Architect for resolution.

   a. See Section 01 3300 "Submittal Procedures" for requirements related to use of Architect's digital data files.
   b. Architect will provide data file layer information. Record markups in separate layers.

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

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

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

1.5 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.

4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.

5. Note related Change Orders, record Product Data, and record Drawings where applicable.

B. Format: Submit record Specifications as annotated PDF electronic files.
1.6 RECORD PRODUCT DATA

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

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
   3. Note related Change Orders, record Specifications, and record Drawings where applicable.

C. Format: Submit record Product Data as annotated PDF electronic files.
   1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

1.7 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic files.
   1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 RECORDING AND MAINTENANCE OF RECORD DOCUMENTS

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

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -
PART 1 GENERAL

1.1 DEMONSTRATION AND TRAINING

A. Prior to acceptance of the Work, provide demonstration and training to Library staff:
   1. Operation and maintenance of all equipment; Installation, Operation, and Maintenance Manuals; and answer staff questions.
   2. Performed by manufacturer's representatives who have been factory-trained or factory-trained engineers, knowledgeable in the operation of the various types of equipment.
   3. Provide additional operator instruction and operation assistance as required in individual Specification Sections.

B. Library may videotape instructions.

C. Visits to the Site by manufacturer's representatives for demonstration and training purposes shall be deemed to be a separate visit to the Site, independent of visits required for equipment checkout, testing, and startup unless prior approval of Library Representative is received to combine visits.

D. Schedule in writing with Library Representative at least thirty (30) Days in advance any visits to the Site by manufacturer's representatives for the purpose of fulfilling their operation and maintenance instruction requirements.

E. Scheduling is subject to approval by Library Representative. Plan, unless otherwise required in individual Specifications Sections, to schedule training sessions so they occur after Work has been completed and the facilities are ready to start normal operation.

END OF SECTION
SUSTAINABLE DESIGN REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CAL-Green”.
   1. Chapter 5- Non-Residential Mandatory Measures.

1.3 RELATED REQUIREMENTS

A. Section 01 6116 “Volatile Organic Compound (VOC) Restrictions.”
B. Section 01 7419 “Construction Waste Management and Disposal.”
C. Section 01 7700 “Closeout Procedures.”
D. Section 01 7900 “Demonstration and Training.”

1.4 DEFINITIONS

A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Respond to questions and requests from Architect and the City regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.6 INFORMATIONAL SUBMITTALS

A. General: Submit CAL-GREEN submittals required by code and in other Specification Sections.
B. CAL-GREEN 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 CAL-GREEN requirements.

C. Acceptable verification submittals are specified in the related sections.

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL
A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 CONSTRUCTION WASTE REDUCTION
A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.3 BUILDING MAINTENANCE AND OPERATION
A. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7900 and Systems Manual as specified in Section 01 7700.

2.4 POLLUTANT CONTROL
A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section and local ordinances.
1. During storage, rough installation and until final start-up of HVAC equipment, securely cover all ducts and air distribution component openings with plastic, tape, sheet metal or other methods acceptable to enforcing agency to reduce dust or debris collected in the system.

B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL
A. Comply with Section 01 7419 "Construction Waste Management and Disposal."
B. Comply with execution requirements of related Sections and applicable local codes and ordinances.
C. Comply with sustainable design of Project as represented by Drawings and Specifications.
   1. Refer to Sustainability Evaluation Memo in Appendix A for an overview.

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 01 Specification Sections, apply to this Section.
   B. OPR and BoD documentation are included by reference for information only.

1.2 SUMMARY
   A. Section includes general requirements that apply to implementation of commissioning without
      regard to specific systems, assemblies, or components.
   B. Related Sections:
      1. Division 23 "Commissioning of HVAC" for commissioning process activities for HVAC&R
         systems, assemblies, equipment, and components.
      2. Division 26 "Commissioning of Electrical" for commissioning process activities for Electrical
         and Lighting systems, assemblies, equipment, and components.

1.3 DEFINITIONS
   A. BoD: Basis of Design. A document that records concepts, calculations, decisions, and product
      selections used to meet the OPR and to satisfy applicable regulatory requirements, standards,
      and guidelines. The document includes both narrative descriptions and lists of individual items
      that support the design process.
   B. Commissioning Plan: A document that outlines the organization, schedule, allocation of
      resources, and documentation requirements of the commissioning process.
   C. CxA: Commissioning Authority.
   D. OPR: Owner's Project Requirements. A document that details the functional requirements of a
      project and the expectations of how it will be used and operated. These include Project goals,
      measurable performance criteria, cost considerations, benchmarks, success criteria, and
      supporting information.
E. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

1.4 COMMISSIONING TEAM

A. Members Appointed by Contractor(s): Individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to, representatives of Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.

B. Members Appointed by Owner:

1. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxA under a separate contract.
2. Representatives of the facility user and operation and maintenance personnel.
3. Architect and engineering design professionals.

1.5 OWNER’S RESPONSIBILITIES

A. Provide the OPR documentation to the CxA and Contractor for information and use.

B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.

C. Provide the BoD documentation, prepared by Architect and approved by Owner, to the CxA and Contractor for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

1.6 CONTRACTOR’S RESPONSIBILITIES

A. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:

1. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
2. Cooperate with the CxA for resolution of issues recorded in the Issues Log.
3. Attend commissioning team meetings held on a variable basis.
4. Integrate and coordinate commissioning process activities with construction schedule.
5. Review and accept construction checklists provided by the CxA.
6. Complete electronic construction checklists as Work is completed and provide to the Commissioning Authority on a weekly basis.
7. Review and accept commissioning process test procedures provided by the Commissioning Authority.
8. Complete commissioning process test procedures.
1.7 **CXA'S RESPONSIBILITIES**

A. Organize and lead the commissioning team.

B. Provide commissioning plan.

C. Convene commissioning team meetings.

D. Provide Project-specific construction checklists and commissioning process test procedures.

E. Verify the execution of commissioning process activities using random sampling. The sampling rate may vary from 1 to 100 percent. Verification will include, but is not limited to, equipment submittals, construction checklists, training, operating and maintenance data, tests, and test reports to verify compliance with the OPR. When a random sample does not meet the requirement, the CxA will report the failure in the Issues Log.

F. Prepare and maintain the Issues Log.

G. Prepare and maintain completed construction checklist log.

H. Witness systems, assemblies, equipment, and component startup.

I. Compile test data, inspection reports, and certificates; include them in the systems manual and commissioning process report.

**PART 2 - PRODUCTS (NOT USED)***

**PART 3 - EXECUTION (NOT USED)***

**- END OF SECTION -**
DIVISION 02 – EXISTING CONDITIONS

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EXISTING CONDITIONS

DIVISION 02
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Demolition and removal of designated portions of building or structure.
   2. Demolition and removal of designated site elements.
   3. Salvage of existing items to be reused or recycled.
   4. Removal of finishes and surfaces as required to install new facilities services and utilities.

B. Disposal of materials.

C. Identification of utilities.

D. Salvaging, storing, and protecting existing work to remain or to be removed and re-installed.

E. Related Requirements:
   1. Section 01 1000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
   2. Section 01 5000 "Temporary Facilities and Controls": Temporary enclosures, dust control barricades, security at occupied areas, and cleanup during construction.
   3. Section 01 7419 "Construction Waste Management".
   4. Section 01 7300 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

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

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.


C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

D. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Use of elevator and stairs.
   5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

E. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations.

F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

G. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.
1.7 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

B. Pre-Demolition Conference: Conduct conference at Project site.
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structure.
   3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   5. Review areas where existing construction is to remain and requires protection.

1.8 FIELD CONDITIONS

A. Coordinate demolition with other trades to assure the proper sequence, limits, methods and time of performance. Schedule work so as to impose a minimum of hardship on the present operation of facilities and the performance of the work of other trades or contracts.

B. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

E. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. Hazardous materials will be removed by Owner before start of the Work.
   2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

F. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
   1. Hazardous material remediation is specified elsewhere in the Contract Documents.
   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
   3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.

G. Storage or sale of removed items or materials on-site is not permitted.

H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Maintain fire-protection facilities in service during selective demolition operations.
1.9 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
   1. <Insert warranted system>.

B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.10 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner’s operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

C. Conduct demolition to minimize interference with adjacent and occupied building areas.

D. Use all means necessary to protect existing objects, construction and plantings designated to remain. In the event of damage, make all repairs and replacements necessary for approval of Architect at no additional cost to the Owner.

E. Protective measures: Provide all necessary safeguards, including warning signs and lights, barricades, and the like, for protection of the public, Contractor’s employees and existing improvements during demolition. Prevent access of unauthorized persons to area of work.

F. Provide at least one person who shall be present at all times during execution of this portion of the work, be thoroughly familiar with the type of work being performed and the best methods for its execution and who shall direct all work performed under this Section.

G. Control the use of water to prevent damage to the existing facilities to remain. Provide wet vacuum equipment where water, such as waste cooling water from concrete sawing or water used as dust emollient, is used adjacent to and in existing buildings.

H. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
   1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.
   1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
   2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
   2. Arrange to shut off utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
   a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
   c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
   d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
   f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
   g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
   4. Cover and protect furniture, furnishings, and equipment that have not been removed.
   5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. 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. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. 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.

5. Maintain fire watch during and for at least <Insert number> hours after flame-cutting operations.


7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

10. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 7419 "Construction Waste Management and Disposal."

B. Examine substrates and surfaces exposed by demolition for water damage, dryrot, decay, termite infestation or other structural failure. Request direction from the Architect if these conditions are discovered. Additional demolition beyond scope originally indicated may be required to fully remove damaged or unsuitable materials.

C. Work not mentioned to be removed that interferes with new construction shall be cut to clean cut lines to provide for proper interface with new construction, or patching and repair, as required.

D. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

E. Work in Historic Areas: Selective demolition may be performed only in areas of Project that are not designated as historic. In historic spaces, areas, and rooms, or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling" as specified in Section 024296 "Historic Removal and Dismantling."

F. Removed and Salvaged Items:
   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.

G. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

H. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Portland cement concrete, asphalt concrete paving: Saw cut or core drill; jackhammering of central areas away from saw-cut joint is acceptable for removing large areas of concrete. Cut back concrete or paving to clean, straight saw-cut lines.
   1. Provide wet vacuum equipment as required for control of waste cooling water.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
   1. Remove existing roof membrane, flashings, copings, and roof accessories.
   2. Remove existing roofing system down to substrate.
   3. Remove existing flooring, wall coverings, trim or other finishes in areas designated to receive new work.
   4. Remove existing construction only to the extent necessary for the proper installation of new construction and junction with existing work. Cut back finished surfaces to straight, plumb or level lines as required.

F. Mechanical, Plumbing and Electrical Systems: Demolish existing improvements as required to permit installation of new systems indicated. Refer to Drawings for additional specific demolition required for mechanical, plumbing and electrical systems.
   1. Securely seal exposed ends of existing ductwork systems left open by demolition operations. Prevent entry of foreign matter. Protect these seals from damage until connected to new work.

G. Remove all fasteners, anchors, supports and similar appurtenances from substrates indicated to remain. Leave substrates in good condition to receive new work.
   1. Pull nails from wood framing. Unthread screws, do not pull out. Do not drive existing nails or screws flush.

SELECTIVE DEMOLITION

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2. Remove suspended ceiling support wires.
3. Remove staples, screws, and miscellaneous anchors from all gypsum board, wood paneling, masonry wall surfaces indicated to remain.

H. Modular materials such as ceiling, resilient and ceramic tile: Remove to a natural point of division in whole units to a joint line with no damaged or defective unit remaining to adjoin new construction.

I. Gypsum wallboard: Remove to a joint line on a support.

J. Wood trim: Remove to a natural existing joint line.

K. All holes or trenches created by removal of underground piping or other facilities demolished shall be filled with clean soil and compacted to the density for fills specified. Do not backfill if subsequent excavation will occur at the same location. Do not backfill hole or trenches until inspected by the Soils Engineer or Architect.

3.7 SALVAGE

A. Items indicated to be salvaged shall be removed carefully, cleaned and stored in a protected location on or off the site until re installed; salvaged items to be delivered to the Owner shall also be removed carefully and presented to the Owner’s designated representative.

B. Owner may take possession of any items of salvage for his use if he desires. Provide incidental labor to relocate designated salvage for Owner’s storage.

C. Salvage existing wood trim of unique or unusual profile. Stockpile and re-install in new locations. Minimize provision of new materials.

D. Salvage existing acoustic ceiling tile of unique or unusual patterns. Stockpile and re-install in new locations where patching is necessary to install new work of other sections. Minimize provision of new materials.

3.8 PATCHING

A. Patch materials to remain when damaged by this work. Finish materials and appearance of the patch or repair work shall match the existing contiguous materials and finishes in all respects and shall be approved by Architect.

B. Where openings are cut oversize or in improper location, replace the excess removed material as instructed by Architect at no additional cost to the Owner.

3.9 DISPOSAL OF DEMOLED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction. and recycle or dispose of them according to Section 01 7419 "Construction Waste Management and Disposal."

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.

4. Comply with requirements specified in Section 01 7419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

3.10 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

- END OF SECTION -
# DIVISION 03 – CONCRETE

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, specific Specification Sections listed below, and all other Specification Sections apply to this Section.

1.2 SUMMARY
A. Section includes surface hardening, sealing, and repair materials for cast-in-place concrete.
   1. Slabs-on-grade.
   2. Suspended slabs.

1.3 RELATED REQUIREMENTS
A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements.”
C. Section 03 1000 “Concrete Forming and Accessories” for Concrete Forming and Accessories
D. Section 03 2000 “Concrete Reinforcing.”
E. Section 03 3000 “Cast-In-Place Concrete”, Concrete Materials, Concrete Mixture Design, Placement Procedures, Tests and Inspections.
F. Sections specifying floor finishes installed over concrete.

1.4 REFERENCES
C. ADA Standards – Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
D. ASTM International:
Mortars (Using 2-in. or [50-mm] Cube Specimens).

5. ASTM C 1059 - Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.

1.5 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

B. Defective Finished Surfaces: Architectural concrete surfaces, including slabs, not meeting requirements of this section, as determined by the Architect.


D. Reveal: Projection of coarse aggregate from matrix or mortar after completion of exposure operations.

1.6 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low / No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

1.7 QUALITY ASSURANCE

A. Field Sample Panels: Before casting architectural concrete, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of three sets of full-scale panels, approximately 48 inches by 48 inches by 6 inches (1200 mm by 1200 mm by 150 mm) minimum, to demonstrate the expected range of finish, color, and texture variations.
   1. Locate panels as indicated or, if not indicated, as directed by Architect.
   2. Demonstrate methods of curing, aggregate exposure, sealers, and coatings, as
applicable.

3. In presence of Architect, damage part of an exposed-face surface for each finish, color, and texture, and demonstrate materials and techniques proposed for repair of tie holes and surface blemishes to match adjacent undamaged surfaces.

4. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.

5. Demolish and remove field sample panels when directed.

1.8 PROTECTION OF MATERIALS

A. Protect materials from damage, weather, and contaminants such as grease, oil, and dirt.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 SURFACE HARDENER / SEALERS

A. Surface Hardener / Sealer, Matte Finish: Water-based chemically-reactive penetrating sealer and hardener, that seals by densifying concrete so that water molecules cannot pass through but air and water vapor can, while allowing concrete to achieve full compressive strength, minimizing surface crazing, and eliminating dusting.

   a. Substitutions: Section 01 2500.

2. Description: Colorless, transparent, odorless, non-toxic, and non-flammable concrete sealer that allows traffic on floors within 2 to 3 hours, with chemical process complete within 3 months. No change to surface appearance except a sheen developed due to traffic and cleaning.
   a. Contains no solvents.
   b. VOC Content: 0 g/L.

B. Concrete Sealer, Gloss Finish: Waterborne concrete sealer producing a gloss finish with high abrasion resistance in the finished floor.

   a. Substitutions: Section 01 2500.

2. Description: High-solids, low-odor, self-crosslinking, urethane fortified acrylic concrete sealer designed to protect interior colored or uncolored concrete.
   a. VOC Content: < 100 g/L.
2.3  REPAIR MATERIALS

A. Bonding Agent: ASTM C 1059, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

B. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements.

C. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 inch to 1/4 inch (3.2 mm to 6 mm) or coarse sand as recommended by underlayment manufacturer.
   4. Compressive Strength: Not less than 6000 psi at 28 days when tested according to ASTM C 109.

D. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 inch to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
   4. Compressive Strength: Not less than 6000 psi at 28 days when tested according to ASTM C 109.

PART 3 - EXECUTION

3.1  EXAMINATION

A. Examine substrates, areas, and conditions with Installer present for compliance with requirements, installation tolerances, and other conditions affecting performance of the work.

B. Verify preparatory work by other trades is complete.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2  PREPARATION

A. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants.
3.3 REPAIRS

A. Propose repair methods for Architect’s approval, and perform proposed repair testing on approved sample panels before repairing permanent work.
   1. Patch a test area on approved sample panel location(s) to verify mixture and color match before proceeding with patching.
   2. Obtain Architect’s written approval of repair method before commencing permanent repair.
   3. Revise rejected repair methods and re-submit, or at Architect’s option, replace defective concrete.

B. Repair and cure defective finished surfaces of cast-in-place architectural concrete only when approved by Architect. Match repairs to color, texture, and uniformity of surrounding surfaces and to repairs on approved sample panels.
   1. Remove and replace cast-in-place architectural concrete that cannot be repaired and cured to Architect’s approval.

3.4 SURFACE HARDENER / SEALER INSTALLATION

A. Treat interior slabs where scheduled.
   1. Do not install surface hardener / sealer on surfaces scheduled to receive finishes specified in other Sections.

B. Install in accordance with manufacturer’s written instructions after recommended minimum concrete cure period.

3.5 PROTECTION AND CLEANING

A. Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.

B. Protect cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.

C. Clean cast-in-place architectural concrete surfaces after finish treatment to remove stains, markings, dust, and debris.
   1. Wash and rinse surfaces according to concrete hardener / sealer manufacturer’s written instructions. Protect other Work from staining or damage due to cleaning operations.
   2. Do not use cleaning materials or processes that could change the appearance of cast-in-place architectural concrete finishes.

D. Protect sealed concrete surfaces from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering.

- END OF SECTION -
## DIVISION 05 – METALS

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METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Shop fabricated metal items and miscellaneous metal work to including but not limited to the following:
   1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
   2. Steel weld plates and angles for casting into concrete not specified in other Sections.
   3. Steel framing and supports for mechanical and electrical equipment.
   4. Steel assemblies as indicated and detailed on Drawings.
   5. Rough hardware.
   6. Miscellaneous framing and supports.
   7. Miscellaneous steel trim.
   8. Loose bearing and leveling plates for applications where they are not specified in other Sections.

B. Products furnished, but not installed, under this Section:
   1. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
   2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Structural Drawings for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts and other items cast into concrete.

D. Section 09 9600 “High Performance Coatings” for preparation, priming with compatible products and finish paint coatings.
E. Elevator Drawings for hydraulic elevator hoistway and pit requirements.

1.4 REFERENCES

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


C. ASTM International Standards as referenced in this Section.

1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes. Include the following:
   1. Nonslip aggregates and nonslip-aggregate surface finishes.
   2. Paint products.
   5. Finishes.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low/No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

D. Shop Drawings: Show fabrication and installation details for metal fabrications.
   1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
   2. Provide templates for anchors and bolts specified for installation under other Sections.
   3. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
   4. Shop drawings shall indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevation, and details where applicable. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

E. Informational Submittals:
   1. Qualification Data: For professional engineer.
2. Where installed metal fabrications are indicated to comply with certain design loadings, include structural computations, material properties, and other information needed for structural analysis that has been signed and sealed by the qualified professional engineer who was responsible for the preparation.

3. Mill Certificates: Signed by manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.


5. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

6. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

7. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article

F. Closeout Submittals:
   1. Submit under provisions of Division 01 Section “Contract Closeout”.
   2. Warranty: Submit specified warranty.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
   3. AWS D1.3 "Structural Welding Code - Sheet Steel."
   4. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.7 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

B. Coordinate installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section.
   1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.
   2. Deliver such items to Project site in time for installation.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver all parts ready for erection; store in close proximity to final locations.

1.9 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on final Shop Drawings.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC Limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Delegated Design: Including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

D. Structural Performance of Alternating Tread Devices: Alternating tread devices shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
   1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
   2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. -inches. (2580 sq. mm).
   3. Uniform and concentrated loads need not be assumed to act concurrently.
   4. Alternating Tread Device Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.

2.2 METALS, GENERAL

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

2.3 FERROUS METAL MATERIALS

A. Steel:
   1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
   2. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 363/A 283M, Grade C or D.
   3. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

B. Stainless Steel:
   1. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
   2. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.
   3. Rolled-Stainless-Steel Floor Plate: ASTM A 793.
C. Zinc-Coated Steel Wire Rope: ASTM A 741.
   1. Wire-Rope Fittings: Hot-dip galvanized-steel connectors with capability to sustain, without 
      failure, a load equal to minimum breaking strength of wire rope with which they are used.

D. Cast Iron:
   1. Gray Iron: ASTM A 48/A 48M.
   2. Malleable Iron: ASTM A 47/A 47M.

E. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
   1. Size of Channels: As indicated on Drawings.
      steel, Grade 33 (Grade 230), with G90 (Z275) coating; 0.108-inch (2.8-mm) [0.079-inch 
      (2-mm)] [0.064-inch (1.6-mm)] nominal thickness.
   3. Material: Cold-rolled steel, ASTM A 1008/A 1008M, [commercial steel, Type B] structural 
      steel, Grade 33 (Grade 230); 0.0966-inch (2.5-mm) [0.0677-inch (1.7-mm)] [0.0528-inch 
      (1.35-mm)] minimum thickness; [unfinished] [coated with rust-inhibitive, baked-on, acrylic 
      enamel] hot-dip galvanized after fabrication.

F. Welding Materials: AWS D1.1; type required for materials being welded.

G. Galvanizing: Hot-dip process ASTM A123 typical and ASTM A153 for threaded fasteners 
   performed after fabrication into largest practical section. Weight of coating not less than 2 oz. 
   per sq. ft. of surface. Where damaged, repair surface with one coat of hot process galvanizing 
   repair compound, "Galvalloy", Galvweldalloy", or approved equal.

H. Primer: Provide primers that comply with Section 09 9600 "High Performance Coatings".

I. Dissimilar Materials: Separate dissimilar surfaces in contact with or in close proximity to non-
   compatible metals, concrete masonry, or plaster with neoprene gasket; or other approved 
   means.

J. Expansion Bolts: Hilti "Kwik Bolt III" Expansion Anchor Bolts, galvanized unless otherwise 
   indicated.

K. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout 
   complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for 
   interior and exterior applications.

2.4 NONFERROUS METAL MATERIALS

A. Aluminum:
2.5 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless-steel fasteners for fastening aluminum.
2. Provide stainless-steel fasteners for fastening stainless steel.
4. Provide bronze fasteners for fastening bronze.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593 (ASTM F 738M); with hex nuts, ASTM F 594 (ASTM F 836M); and, where indicated, flat washers; Alloy Group 2 (A4).

D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

E. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

F. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

G. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.

H. Eyebolts: ASTM A 489.

I. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

J. Lag Screws: ASME B18.2.1 (ASME B18.2.3.8M).


M. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 inches by 7/8 inches (41 by 22 mm) by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches (200 mm) o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

2.6 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Galvanizing: Hot-dip process ASTM A123 typical and ASTM A153 for threaded fasteners performed after fabrication into largest practical section. Weight of coating not less than 2 oz. per sq. ft. of surface.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints and coatings specified to be used over it. For site touch up only.
   1. Material: Type B Tnemec Series 94-H2O Hydro-Zinc Primer or equivalent meeting requirements
   2. VOC Content:
      a. All paints and coatings within the vapor barrier must meet the VOC levels listed in pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions
   3. Surface Preparation: SSPC–SP6 Commercial Blast Cleaning. For severe (immersion) exposure SSPC-SP 10 Near-White Blast Cleaning is required.
   4. Application: Follow coatings manufacturer’s printed instructions
   5. Number of coats: One
   6. Dry Film Thickness: 2.5 to 3.5 mils DFT
   9. ASTM B 117 Salt Spray (Fog) Testing 30,000 Hours passed
   10. Prohesion testing: ASTM G 85 15,000 Hours passed

D. Primer: A “shop or field” compliant hydrophobic acrylic rust-inhibitive primer/finish for painting of ferrous metal, structural and miscellaneous steel for interior dry exposure. Also suitable over galvanized steel and organic zinc-rich coatings in wet exposures. A water-borne equivalent to “Standard Alkyd Shop Primer”. Provide primers that are compatible with Division 09 painting Sections and Division 09 Section "High-Performance Coatings."
   1. Surface Preparation: SP3 Power Tool Cleaning. Where jobsite exposure is expected to exceed 6 months, SSPC–SP6 Commercial Blast Cleaning is required.
   2. Material: Type A Tnemec Series 115 Uni-Bond DF Primer or equivalent meeting requirements.
   3. Number of Coats: One.
   4. Dry Film Thickness: 2.0 to 4.0 mils DFT
   6. VOC’s:
      a. All paints and coatings within the vapor barrier must meet the VOC levels listed in Section 01 6116.
7. HAP’s: 0 lbs./gallon  
9. ASTM D 4585 Water Resistance 1,992 hours passed.  
10. ASTM D 1654 Corrosive Environments 1,992 hours passed.  
11. Substitutions: Section 01 2500.

E. Dissimilar Materials: Separate dissimilar surfaces in contact with or in close proximity to non-compatible metals, concrete masonry, or plaster with neoprene gasket; or other approved means.

F. Expansion Bolts: Hilti "Kwik Bolt III" Expansion Anchor Bolts, galvanized unless otherwise indicated.

G. Non-shrink Grout: Master Builders 928 or equal.

H. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.  
   1. All paints and coatings within the vapor barrier must meet the VOC levels listed in Section 01 6116.

I. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications.


K. Concrete: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).

2.7 FABRICATION, GENERAL

A. Metal Surfaces, General:  
   1. Provide materials with smooth, flat surfaces, unless otherwise indicated.  
   2. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.  
      a. Refer to Section 05 1213 "Architecturally-Exposed Structural Steel (AESS) Framing”

B. Shop Assembly: Preassemble items in the shop to greatest extent possible.  
   1. Disassemble units only as necessary for shipping and handling limitations.  
   2. Use connections that maintain structural value of joined pieces.  
   3. Clearly mark units for reassembly and coordinated installation.

C. Provide for anchorage of type indicated; coordinate with supporting structure.  
   1. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
D. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.
   1. Temperature Change (Range): 100 deg F.

E. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water.
   1. Provide weep holes where water may accumulate.

F. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

G. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

H. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

I. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

J. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

K. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible.
   1. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated.
   2. Locate joints where least conspicuous.
   3. Comply with Section 05 1213 “Architecturally-Exposed Structural Steel (AESS) Framing”

L. Weld corners and seams continuously to comply with the following:
   1. Comply with Section 05 1213 “Architecturally-Exposed Structural Steel (AESS) Framing”
   2. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   3. Obtain fusion without undercut or overlap.
   4. Remove welding flux immediately.
   5. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

M. Ease exposed edges to a radius of approximately 1/32 -inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

N. Cut, drill, and punch metals cleanly and accurately.
1. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

O. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

P. Shear and punch metals cleanly and accurately.
1. Remove burrs.

2.8 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

D. Comply with Section 09 9600 "High-Performance Coatings."

2.9 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
1. Shop prime with primers specified in Division 9 Section "High-Performance Coatings".

C. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
3. Items Indicated to Receive Primers Specified in Division 9 Section "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Items: SSPC-SP 3, "Power Tool Cleaning."

D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

E. Stainless Steel Finishes:
1. Remove tool and die marks and stretch lines or blend into finish.
2. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
3. Bright, Directional Satin Finish: No. 4.
4. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

2.10 ALUMINUM FINISHES
A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
B. As-Fabricated Finish: AA-M10 (Mechanical Finish, as fabricated, unspecified).

2.11 ROUGH HARDWARE
A. Furnish bent, or otherwise custom-fabricated, bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures.
   1. Straight bolts and other stock rough hardware items are specified in Division 06 Sections.
B. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts that bear on wood structural connections, and furnish steel washers elsewhere.

2.12 MISCELLANEOUS FRAMING AND SUPPORTS
A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
   1. Fabricate units from slotted channel framing where indicated.
   2. Furnish inserts for units installed after concrete is placed.
C. Galvanize miscellaneous framing and supports where indicated.
   1. Prime miscellaneous framing and supports with primer specified in Division 09 Section "High-Performance Coatings" where indicated.
   2. Exterior locations.
   3. Interior locations where indicated.

2.13 MISCELLANEOUS STEEL TRIM
A. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices wherever possible.
B. Provide cutouts, fittings, and anchorages as required to coordinate assembly and installation with other work. Provide anchors, welded to trim, for embedding in concrete or masonry construction, spaced not more than 6 -inches from each end, 6 -inches from corners, and 24 -inches o.c., unless otherwise indicated.
C. Galvanize miscellaneous steel trim in the following locations:
   1. Exterior locations.

D. Interior locations where indicated. Prime exterior miscellaneous steel trim with primer specified in Division 09 Section "High-Performance Coatings".

2.14 CLOSURES AND TRIM

A. Form closures and trim from metal of type and thickness indicated below. Fabricate to fit tightly to adjoining construction.
   1. Metal Sheet: Thickness required to comply requirements as detailed on Drawings.
      c. Finish: Two-coat fluoropolymer (Kynar).
      d. Color: Match Architect’s sample.

2.15 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates.

C. Prime plates with zinc-rich primer.

2.16 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span but not less than 8 inches (200 mm) unless otherwise indicated.

C. Galvanize loose steel lintels located in exterior walls.

D. Prime loose steel lintels located in exterior walls with zinc-rich primer.

2.17 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work.
   1. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.18 ANGLE FRAMES, EDGE ANGLES, AND COUNTERTOP BRACKETS

A. General:
1. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4 -inch (19-mm) bolts, spaced not more than 6 -inches (150 mm) from ends and 24 -inches (600 mm) o.c., unless otherwise indicated.
   a. Provide mitered and welded units at corners.
   b. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 -inches (50 mm) larger than expansion or control joint.

2. Complete with anchors and bolts. For casting in concrete, space anchors 24 -inches OC with 1-1/4 -inches by 1/4 -inch by 8 -inches steel straps.

   a. All paints and coatings within the vapor barrier must meet the VOC levels listed in Section 01 6116 "Volatile Organic Compound (VOC) Restrictions".
   b. Provide primers that comply with Section 09 9600 "High Performance Coatings".
   c. Paint in accordance with Section 09 9600 “High-Performance Coatings”

4. Locate supports as required by manufacturer to suspend partitions from structure above without sags or undue deflection affection operation of partitions.

B. Corner Slab Edge Angles:
   1. Schedule:
      a. Roof edge.
      b. Where indicated.
   2. Description:
      a. Provide edge of slab corner angle, extending the entire length of slab at load dock, with Nelson embed bolts.
      b. Provide edge angles and anchors for placement in fresh concrete.
      c. Galvanize exterior edge angles after fabrication.
   3. Material:
      a. Provide edge angles of steel angles for loading dock edges, refer to details for additional information
   4. Profiles:
      a. 90 Degree angle, refer to details
      b. Chamfered angle, refer to details
   5. Assembly:
      a. Provide edge angles and anchors for placement in fresh concrete.
      b. Complete with anchors and bolts. For casting in concrete, space anchors 24 -inches OC with 1-1/4 -inches by 1/4 -inch by 8 -inches steel straps.
      c. Drill and tap for anchorage otherwise.

C. Wedge-Type Concrete Inserts:
   1. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete. For casting in concrete, space anchors 24 -inches o.c. with 1-1/4 -inches by 1/4 -inch by 8 -inches steel straps.
   2. Furnish complete with fasteners to attach shelf angles to cast-in-place concrete.

D. Countertops:
   1. Provide steel angle framing to support countertops.
E. Shelf Angles:
1. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch (19-mm) bolts, spaced not more than 6-inches (150 mm) from ends and 24-inches (600 mm) o.c., unless otherwise indicated.
   a. Provide mitered and welded units at corners.
   b. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2-inches (50 mm) larger than expansion or control joint.

2.19 ELEVATOR - METAL ELEVATOR HOIST WAY SILLS
A. General:
   1. Steel angle, refer to Drawings

2.20 METAL ELEVATOR HOIST WAY BEAMS
A. General:
   1. Refer to Elevator Drawings
   2. Comply with ASME A17.1.

B. Hoistway Beam:
   1. Refer to Structural Drawings

2.21 METAL ELEVATOR PIT LADDER
A. General:
   1. Comply with ANSI A14.3 unless otherwise indicated.
   2. For elevator pit ladders, comply with ASME A17.1.
   3. Refer to drawings.

B. Steel Ladders:
   1. Space siderails 18-inches (457 mm) apart unless otherwise indicated.
   2. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
   3. Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to rung.
      a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
         1) IKG Industries, a division of Harsco Corporation; Mebac.
         2) SlipNOT Metal Safety Flooring, a W. S. Molnar company; SlipNOT.
   4. Support each ladder at top and bottom and not more than 60-inches (1500 mm) o.c. with welded or bolted steel brackets.
   5. Galvanize ladders, including brackets and fasteners.

C. Prime ladders, including brackets and fasteners, with primer specified in Division 09 Section "High-Performance Coatings".
PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
   1. Cast Aluminum: Heavy coat of bituminous paint.
   2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

C. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
   1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.
D. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.
   1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLING BEARING AND LEVELING PLATES


B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
   1. Use nonshrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations unless otherwise indicated.
   2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 painting Sections.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780

- END OF SECTION -
# DIVISION 06 – WOOD, PLASTICS AND COMPOSITES

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Wood and plastic blocking and nailers.
2. Plywood backing panels, for telephone and communications equipment.
3. Wood sleepers.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements”.
C. Section 06 2000 "Finish Carpentry" for nonstructural carpentry items exposed to view and not specified in another section.
D. Section 06 2013 "Exterior Finish Carpentry" for nonstructural carpentry items exposed to view and not specified in another Section.
E. Section 06 4023 “Interior Architectural Woodwork”

1.4 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CAL-Green”.
1.5 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
   3. NLGA: National Lumber Grades Authority.
   5. WCLIB: West Coast Lumber Inspection Bureau.

1.6 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.

B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
   2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
   3. For fire-retardant treatments specified to be High-Temperature (HT) type include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
   4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
   5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low/No-VOC Paints and Coatings. Provide certification that all primers and coatings meet VOC emission limits specified in related section. List manufacturer, brand, application, type (flat or non-flat), number of gallon, and the VOC emissions in grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

D. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
   1. Preservative-treated wood.
   2. Fire-retardant-treated wood.
5. Expansion anchors.
6. Metal framing anchors.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

B. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, “Principles and Criteria”:
   1. Sleepers.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of Section 01 6000.

B. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

C. Deliver interior wood materials that are to be exposed to view only after building is enclosed and weatherproof, wet work other than painting is dry, and HVAC system is operating and maintaining temperature and humidity at occupancy levels.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC Limits for adhesives sealants, fillers, primers, and coatings. Comply with limits specified in related section.

B. Composite Wood products must meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as specified in Section 01 6116.

2.2 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

4. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

C. All products shall meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as specified in related Section.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS (PT)

A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).
   1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
   2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
   1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:
   1. Wood blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
   2. Wood blocking, sleepers and similar concealed members in contact with masonry or concrete.

2.4 PLASTIC BLOCKING

A. Plastic Blocking, Non-Fire rated: High Density Polyethylene.
   1. Compressive strength 1420 psi.
   2. Moisture absorption: 0.06% by weight.
   4. Flash Point: 644 deg. F.
   5. Products:
      a. Mac Lumber, www.maclumber.com
      b. Substitutions: Section 01 2500.

   1. Compressive strength 1420 psi.
2. Moisture absorption: 0.06% by weight.
4. Flash Point: 644 deg. F.
5. Fire Resistance: Match rating of wall assembly, tested in accordance with ASTM E162 and ASTM E662.
6. Products:
   a. FIREX by Mac Lumber, www.maclumber.com
   b. Substitutions: Section 01 2500.

C. Provide sizes and thickness necessary to suit conditions indicated.

2.5 FIRE-RETARDANT-TREATED MATERIALS

A. General: Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood).
   1. Use treatment that does not promote corrosion of metal fasteners.
   2. Use Exterior type for exterior locations and where indicated.
   3. Use Interior Type A, High Temperature (HT) for enclosed roof framing, framing in attic spaces, and where indicated.
   4. Use Interior Type A, unless otherwise indicated.
   5. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
      a. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
   6. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
   7. Application: Treat items indicated on Drawings, and the following:
      a. Concealed blocking.
      b. Plywood backing panels.

B. Fire Rated Plywood Backing Panels:
   1. IT/Data Closet, Telephone and Electrical Room and similar locations: Interior Fire Retardant-Treated FRS Plywood, Class A, Type 1,
      a. Grade ACX with pine or fir front face, paintable, clean and free of knots.
      b. Kiln-dried after treatment in accordance with AWPA Standard C-27.
      c. Flame spread less than 5 and smoke developed less than 125 per ASTM E84 and UL 723.
      d. Thickness: 3/4-inch (23/32).
   2. Warehouse Wainscot Panels: DOC PS 1, Exposure 1, C-D Plugged, Interior Fire Retardant-Treated FRS Plywood, in thickness indicated or, if not indicated, not less than 3/4 inch nominal thickness.
      a. Kiln-dried after treatment in accordance with AWPA Standard C-27.
      b. Flame spread less than 5 and smoke developed less than 125 per ASTM E84 and UL 723.
2.6 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
   1. Blocking.
   2. Nailers.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any of the following species:
   1. Hem-fir (north); NLGA.
   2. Spruce-pine-fir; NLGA.
   3. Hem-fir; WCLIB, or WWPA.
   4. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
   5. Western woods; WCLIB or WWPA.

C. For blocking not used for attachment of other construction Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
   1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.


D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as
determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.


2.8 METAL FRAMING ANCHORS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cleveland Steel Specialty Co.
2. Harlen Metal Products, Inc.
3. KC Metals Products, Inc.
4. Simpson Strong-Tie Co., Inc.
5. Southeastern Metals Manufacturing Co., Inc.
6. USP Structural Connectors.


1. Use for interior locations where stainless steel is not indicated.

2.9 MISCELLANEOUS MATERIALS

A. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

1. Comply with Section 01 6116.

B. Flexible Flashing: Use as separator between preservative treated wood and metal decking or framing; Type specified in Section 07 2500.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.
D. Do not splice structural members between supports, unless otherwise indicated.

E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
   1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16-inches (406 mm) o.c.

F. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
   1. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96-inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- (38-mm actual-) thickness.

G. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

H. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
   1. Use inorganic boron for items that are continuously protected from liquid water.
   2. Use copper naphthenate for items not continuously protected from liquid water.

I. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
   1. NES NER-272 for power-driven fasteners.
      a. Table 2304.9.1, "Fastening Schedule," in California Building Code.

J. Use common wire nails, unless otherwise indicated.
   1. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.
   2. Make tight connections between members.
   3. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work.
   1. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading.
   1. Recess bolts and nuts flush with surfaces, unless otherwise indicated.
3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings.
   1. Shim with wood as required for tolerance of finish work.

3.4 PROTECTION

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

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Interior wood trim.
   2. Shelving and interior closet trim.

1.3 RELATED REQUIREMENTS:

A. Section 09 9300 “Staining and Transparent Finishing.”

B. Section 09 9123 "Interior Painting" for priming and backpriming of interior finish carpentry.

1.4 REFERENCES


   1. Woodwork Institute, http://woodworkinstitute.com
1.5 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product indicated, demonstrate compliance with specified attributes.

B. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low / No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.
   3. Composite Wood Formaldehyde Limits: Provide certification that all products meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as specified in Section 01 6116.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Composite Wood products must meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as specified in Section 01 6116.

C. Lumber: DOC PS 20.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. For exposed lumber, mark grade stamp on end or back of each piece.

D. Softwood Plywood: DOC PS 1.

E. Hardboard: ANSI A135.4.

F. Composite Wood and Agrifiber Products: Provide materials that meet or exceed requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
   3. Industrial Grade Medium Density Fiberboard (MDF) manufactured with a formaldehyde-free adhesive system which meets the physical properties of ANSI A208.2, Grade 155 specifications.
      b. SCS certified for pre-consumer recycled wood fiber content.
4. **Interior High Moisture Areas:** Industrial Grade Medium Density Fiberboard (MDF) manufactured with a formaldehyde-free adhesive system which meets the physical properties of ANSI A208.2, Grade 155 specifications.
   a. **Product:** Medex MDF as manufactured by Roseburg, Dillard, OR; tel: (800) 245-1115, web: [www.roseburg.com](http://www.roseburg.com).
   b. **SCS certified for pre-consumer recycled wood fiber content.**

5. **Class 1 (A) Rated Interior Finish Areas:** Industrial Grade Medium Density Fiberboard (MDF) manufactured with a formaldehyde-free adhesive system and certified as a Class 1 Flame Retardant panel in accordance with ASTM E 84.
   a. **Product:** Medite FR MDF as manufactured by Roseburg, Dillard, OR; tel: (800) 245-1115, web: [www.roseburg.com](http://www.roseburg.com).
   b. **SCS certified for pre-consumer recycled wood fiber content.**

### 2.2 FIRE-RETARDANT-TREATED MATERIALS

A. **Fire-Retardant-Treated Lumber and Plywood by Pressure Process:** Products with a flame-spread index of 25 or less when tested according to ASTM E 84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
   1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent, respectively.

B. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
   1. For exposed lumber and plywood indicated to receive a stained or natural finish, mark back of each piece.

C. Application: Where indicated.

### 2.3 INTERIOR TRIM

A. **Hardwood Lumber Trim:** As indicated on the Drawings, NHLA.
   1. **Species and Grade:** As shown on the Drawings.
   3. **Maximum Moisture Content:** 10 percent.
   4. **Finger Jointing:** Not allowed.

B. **Hardwood Moldings for Transparent Finish (Stain or Clear Finish):** MMPA HWM 4, N-grade wood moldings made to patterns included in MMPA's "HWM/Series Hardwood Moulding Patterns."
   1. **Species:** As indicated on the Drawings.
   2. **Maximum Moisture Content:** 9 percent.

C. **Moldings for Opaque Finish (Painted Finish):** Made to patterns included in MMPA's "WM/Series Wood Moulding Patterns."
   1. **Hardwood Moldings:** MMPA HWM 4, P-grade.
      a. **Species:** As indicated on the Drawings. If none is shown, provide Birch or Poplar.
      b. **Maximum Moisture Content:** 9 percent.
   2. **Finger Jointing:** Not allowed.
D. Molding Patterns: As indicated on the Drawings.

2.4 SHELVING AND CLOTHES RODS

A. Closet and Utility Shelving: Made from the following material, 3/4 inch (19 mm) thick.
   1. MDF with radiused or solid-wood front edge.

B. Shelf Cleats: 3/4-by-3-1/2-inch (19-by-89-mm) boards, as specified above for lumber trim for opaque finish.

C. Shelf Brackets with Rod Support: BHMA A156.16, B04051; prime-painted formed steel.

D. Shelf Brackets without Rod Support: BHMA A156.16, B04041; prime-painted formed steel.

E. Clothes Rods: 1-1/2-inch- (38-mm-) diameter, clear, kiln-dried Douglas fir or southern pine.

2.5 MISCELLANEOUS MATERIALS

A. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

B. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.2 INSTALLATION, GENERAL

A. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
   1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
   2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
   3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining interior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
3.3 STANDING AND RUNNING TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

3.4 SHELVING AND CLOTHES ROD INSTALLATION

A. Cut shelf cleats at ends of shelves about 1/2 inch (13 mm) less than width of shelves and sand exposed ends smooth.

B. Install shelf cleats by fastening to framing or backing with finish nails or trim screws, set below face and filled. Space fasteners not more than 16 inches (400 mm) o.c.

C. Install shelf brackets according to manufacturer’s written instructions, spaced not more than 32 inches (800 mm) o.c. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.

D. Cut shelves to neatly fit openings with only enough gap to allow shelves to be removed and reinstalled. Install shelves, fully seated on cleats, brackets, and supports.

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following shop-fabricated items:
   1. Custom plastic-laminate faced and wood cabinets.
   2. Cabinet hardware.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 "Sustainable Design Requirements."
C. Section 06 1053 "Miscellaneous Rough Carpentry" for furring, blocking, shims, hanging strips and other carpentry, not exposed to view, required for installing woodwork specified in this Section.
D. Section 09 2216 "Non-Structural Metal Framing" for reinforcements in metal-framed partitions for anchoring architectural cabinets.
E. Pertinent sections of Division 12 specifying countertops.
F. Pertinent sections specifying items built into or penetrating work of this Section.
G. Section 06 2023 "Interior Finish Carpentry" for interior carpentry and trim

1.4 REFERENCES


D. American National Standards Institute (ANSI):
   1. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications.

E. ASTM International:

F. Builders Hardware Manufacturers Association (BHMA):
   1. ANSI/BHMA A156.9 – Cabinet Hardware.
   2. ANSI/BHMA A156.11 – Cabinet Locks.
   3. ANSI/BHMA A156.16 – Auxiliary Hardware.
   4. ANSI/BHMA A156.18 – Materials and Finishes.

G. Environmental Protection Agency (EPA):


1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include data for panel products, high-pressure decorative laminate, adhesives for bonding plastic laminate, hardware, accessories, finishing materials and processes.
   2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Composite Wood Formaldehyde Limits: Provide certification that all products meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as specified in Section 01 6116.

D. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
1. Apply Woodwork Institute certification compliance label to first page of Shop Drawings.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for items installed in architectural cabinets.

E. Samples:
1. Exposed cabinet hardware and accessories, one unit for each type and finish.
2. Plastic laminates, 8 by 10 inches (200 by 250 mm), for each type, color, pattern, and surface finish, with one sample applied to core material and specified edge material applied to one edge.
3. Thermoset decorative panels, 8 by 10 inches (200 by 250 mm), for each type, color, pattern, and surface finish, with edge banding on one edge.

F. Product Certificates: For each type of product, signed by product manufacturer.
1. Composite wood and agrifiber products.
2. Thermoset decorative panels.
3. High-pressure decorative laminate.
4. Adhesives.
5. Glass.

G. Woodwork Institute Quality Standard Compliance Certificates: Woodwork Institute certified compliance certificates.

H. Qualification Data: For Fabricator and Installer.


1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a licensee of the Woodwork Institute Quality Certification Program.

B. Installer Qualifications: Licensee of the Woodwork Institute Quality Certification Program.

C. Quality Standard: Unless otherwise indicated, comply with NAAWS for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
1. Provide Woodwork Institute Quality Certification Program compliance labels and certificates indicating that woodwork, including installation, complies with requirements of grades specified.
2. If the Contract Documents contain requirements that are more stringent than the referenced woodwork quality standard, comply with requirements of Contract Documents in addition to those of the referenced quality standard.

D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockups of typical architectural cabinets as shown on Drawings.

ARCHITECTURAL CABINETS

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2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Pre-Installation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas.
   1. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.8 PROJECT CONDITIONS

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

B. Environmental Limitations for Interior Work: Do not deliver or install interior woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels for at least five days prior to installation and during the remainder of the construction period.
   1. Material Acclimation: Allow wood material to acclimate offsite in a controlled environment to project occupancy temperature and relative humidity levels.
      a. Refer to Mechanical Drawings and Specifications for project occupancy temperature and relative humidity levels.

C. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed or concealed by construction, and indicate measurements on Shop Drawings.

D. Established Dimensions: Where woodwork is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 COORDINATION

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

B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)" to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Provide composite wood products that meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as specified in related Section.

C. Quality Grade: Unless otherwise indicated provide products of quality specified by NAAWS for the following.
   1. Plastic Laminate Faced Cabinets: Custom grade.
   2. Wood Cabinets: Premium grade.

D. Construct cabinets to support 200 pound dead load on countertop.

E. Construct multiple self-supporting units rigidly joined together.

2.2 WOOD MATERIALS

A. General: Provide materials that comply with requirements of NAAWS quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
   1. Wood Moisture Content: 8 percent or less.
   2. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
   3. Lumber: DOC PS 20 and the following grading rules:
      a. WCLIB: West Coast Lumber Inspection Bureau, Standard No. 17, "Grading Rules for West Coast Lumber,"
      b. WWPA: Western Wood Products Association, "Western Lumber Grading Rules."
      c. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.
         1) For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by inspection agency.

C. Composite Wood and Agrifiber Products: Provide materials that meet or exceed requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
3. Industrial Grade Medium Density Fiberboard (MDF) manufactured with a formaldehyde-free adhesive system which meets the physical properties of ANSI A208.2, Grade 155 specifications.
   a. Product: Medite II MDF as manufactured by Roseburg, Dillard, OR; tel: (800) 245-1115, web: [www.roseburg.com](http://www.roseburg.com).
   b. SCS certified for pre-consumer recycled wood fiber content.
4. Interior High Moisture Areas: Industrial Grade Medium Density Fiberboard (MDF) manufactured with a formaldehyde-free adhesive system which meets the physical properties of ANSI A208.2, Grade 155 specifications.
   a. Product: Medex MDF as manufactured by Roseburg, Dillard, OR; tel: (800) 245-1115, web: [www.roseburg.com](http://www.roseburg.com).
   b. SCS certified for pre-consumer recycled wood fiber content.
5. Class 1 (A) Rated Interior Finish Areas: Industrial Grade Medium Density Fiberboard (MDF) manufactured with a formaldehyde-free adhesive system and certified as a Class 1 Flame Retardant panel in accordance with ASTM E 84.
   a. Product: Medite FR MDF as manufactured by Roseburg, Dillard, OR; tel: (800) 245-1115, web: [www.roseburg.com](http://www.roseburg.com).
   b. SCS certified for pre-consumer recycled wood fiber content.

### 2.3 HIGH-PRESSURE DECORATIVE LAMINATE (PL1, PL2)

#### A.
High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

1. Provide laminate products that meet UL GREENGUARD Gold Certification or SCS/Indoor Advantage Gold Certified.
2. Acceptable Manufacturers: Subject to exact compliance with requirements, provide high-pressure decorative laminates by one of the following:
   b. Lamin-Art, a Wilsonart company; web: [www.laminart.com](http://www.laminart.com).
   c. Formica Group; web: [www.formica.com](http://www.formica.com).
   d. Nevamar Company, LLC; Decorative Products Division; web: [www.nevamar.com](http://www.nevamar.com).
   e. Panolam Industries International Incorporated; web: [www.pionite.com](http://www.pionite.com).
3. Colors and Patterns: As indicated on Drawings.
4. Locations: As indicated on Drawings.

### 2.4 FIRE-RETARDANT-TREATED MATERIALS

#### A.
If concealed blocking spaces for paneling or wainscots exceed 1.75 inches in depth, provide finish materials that either meet, or are treated to meet, NC IBC Class A requirements.

#### B.
Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

1. Use treated materials that comply with requirements of referenced woodworking standard. Do not use materials that are warped, discolored, or otherwise defective.
2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.

3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.

C. Fire-Retardant-Treated Lumber and Plywood: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Kiln-dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent, respectively.

2. For items indicated to receive a stained or natural finish, use organic resin chemical formulation.

3. Mill lumber after treatment within limits set for wood removal that do not affect listed fire-test-response characteristics, using a woodworking shop certified by testing and inspecting agency.

4. Mill lumber before treatment and implement procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of architectural cabinets.

D. Fire-Retardant Fiberboard: Refer to Article “Wood Materials.”

2.5 MISCELLANEOUS MATERIALS

A. Thermoset Decorative Panels (Melamine): Medium-density fiberboard (MDF) finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.

1. Provide PVC or polyester edge banding complying with LMA EDG-1 on components with exposed or semi-exposed edges.

B. Furring, Blocking, Shims, and Hanging Strips: Softwood lumber, fire-retardant treated where required, kiln dried to less than 15 percent moisture content.

C. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

D. Tempered Float Glass for Cabinet Doors and Shelves: ASTM C 1048, Kind FT, Condition A, Type I, Class 1 (clear), Quality-Q3, with exposed edges seamed before tempering, 6 mm thick minimum and thicker as indicated on drawings.

E. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

F. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to EPA 40 CFR 59, Subpart D (Method 24):

1. Wood Glues: 30 g/L.
2. Multipurpose Construction Adhesives: 70 g/L.
3. Contact Adhesive: 250 g/L.

G. Adhesive for Bonding Plastic Laminate: Contact cement, for general use and for post-forming. Use unpigmented product with through-color laminate.
   1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

H. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

2.6 PLASTIC-LAMINATE FACED ARCHITECTURAL CABINETS

A. NAAWS Grade: Custom.
   1. Cabinets to be constructed to support 200 pound dead load on countertop.
   2. Shelves to be constructed to support 50 pound per square foot dead load.

B. NAAWS Construction Type: Type I, multiple self-supporting units rigidly joined together.

C. NAAWS Construction Style: Frameless Style.

D. NAAWS Door and Drawer Front Style: Flush overlay.

E. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
   1. Horizontal Surfaces Other Than Tops: Grade HGS.
   2. Postformed Surfaces: Grade HGP.
   3. Vertical Surfaces: Grade HGS.
   4. Edges: PVC tape, 0.018-inch minimum thickness, matching laminate in color, pattern, and finish.
   5. Pattern Direction: Vertically for doors and fixed panels, horizontally for drawer fronts.

F. Materials for Semi-Exposed Surfaces:
   1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
      a. Edges of Plastic-Laminate Shelves: PVC tape, 0.018-inch minimum thickness, matching laminate in color, pattern, and finish.
      b. For semiexposed backs of panels with exposed plastic-laminate surfaces provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
   2. Drawer Sides and Backs: Thermoset decorative panels with PVC or polyester edge banding.
   3. Drawer Bottoms: Thermoset decorative panels.

G. Dust Panels: 1/4 inch (6.4 mm) plywood or tempered hardboard above compartments and drawers, unless located directly under tops.

H. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.
I. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
   1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners.

J. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
   1. Match Architect’s sample, unless otherwise noted on drawings.

2.7 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets provided under this Section.

B. Hardware Standard: Comply with ANSI/BHMA A156.9 Grade 1, Heavy Duty for all cabinet hardware items, unless otherwise noted.

C. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, self-closing.
   1. Degrees of Opening: 100, 135, or 170 – verify with Architect.

D. Wire Pulls: Back mounted, stainless steel, solid metal, finish as selected: Doug Mockett DP57 Series or equivalent from Häfele.
   1. 6 inch on drawers and upper and base cabinet doors.
   2. 12 inch on full height cabinet doors.

E. Catches: Magnetic catches, ANSI/BHMA A156.9, B03141.

F. Shelf Rests: ANSI/BHMA A156.9, meet or exceed Grade 1 B04013. Plated Steel, 0.5mm hole diameter with seismic (earthquake) pin and pre-drilled hole for seismic fastener to shelf; 50 pounds per clip working load capacity; Plastic clips will be rejected.

G. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04071; with shelf rests, B04081.

H. Under Counter Concealed Wire Manager: Doug Mockett & Company “WM9” 3 inch by 3 inch plastic extrusion tray, cut and mitered to fit. Color: Matte Black

I. Brush and Extrusion Wire Manager: Doug Mockett & Company BREXT3 – 3” brush grommet and plastic extrusion cut and mitered to fit.
   1. Color: Matte Black

J. Drawer Slides: Meet or exceed ANSI/BHMA A156.9. Grade 1, Heavy Duty.
   1. Grade 1: Side mounted and extending under bottom edge of drawer; full-extension type; epoxy-coated steel with polymer rollers.
   2. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-overtravel-extension type; zinc-plated-steel ball-bearing slides.
   3. For drawers not more than 3 inches high and not more than 24 inches wide, provide Grade 1, 150 lb. Capacity.
   4. For drawers more than 3 inches high but not more than 6 inches high and not more than 24 inches wide, provide Grade 1HD-100, 150 lb. Capacity.
5. For drawers more than 6 inches high or more than 24 inches wide, provide Grade 1HD-200.
6. For computer keyboard shelves, provide Grade 1HD-100.
8. File Drawers: 1-inch Over-Travel, 200 lb. Static Load Capacity, Three-Section Slide, 0.63 Inch Slide Space.

K. Shelf Slides: Under-mount, full-extension, zinc-plated steel drawer slides with steel ball bearings, ANSI/BHMA 156.9, B05091, rated for the following loads:

L. Drawer and Cabinet Locks: ANSI/BHMA A156.11, E07041.
2. Product: 100 DR deadbolt lock for cabinet doors; 200 D deadbolt lock for cabinet drawers.
3. Provide locks at drawers, single doors and on active leaf of paired doors as indicated on drawings.
4. Provide 2 keys for each lock.
5. Provide lock for active leaf of pairs of doors with elbow catch for inactive leaf.

M. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.

N. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA finish number indicated.
1. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
2. Satin Stainless Steel: BHMA 630.
3. For concealed hardware, provide manufacturer’s standard finish that complies with product class requirements in ANSI/BHMA A156.9.

O. Laminate Cap Grommets for Cable Passage through at laminate Countertops: 3 inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage except as noted otherwise. Laminate to match adjacent laminate.
1. Manufacturer: LG3 Laminate Cap manufactured by Doug Mockett & Co.

P. Grommets for Cable Passage through at non-laminate Countertops: 3-1/2 inch OD, satin aluminum grommets and matching satin aluminum caps with oval cord slot lined with radiused brush for wire passage except as noted otherwise.
1. Manufacturer: Provide “ABG3-94” by Doug Mockett & Company, Inc.

Q. Sliding Door Track Assemblies: Upper and lower track of satin anodized aluminum, with matching shoe equipped with nylon rollers.

R. Metal “Z” Clips: Two-part panel clips, with one part of each clip mechanically attached to back of wood wall panel and the other part to wall substrate, or metal stud, designed to allow for panel removal. Secure bottom of panels with Velcro fasteners.
2.8 COUNTERTOPS

A. Refer to pertinent Division 12 Sections.

2.9 FABRICATION

A. NAAWS Grade: Unless otherwise indicated, provide architectural cabinets complying with Custom quality standard.

B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

C. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

D. Fabricate wood cabinet work to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
   1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch (1.5 mm).
   2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).

E. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
   2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.

F. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
   1. Seal edges of openings in countertops with a coat of varnish.

G. Install glass to comply with applicable requirements in Division 08 Section "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

2.10 SHOP FINISHING

A. Grade: Provide finishes of same grades as items to be finished.

B. General:
   1. Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
2. Shop finish transparent-finished interior architectural woodwork at fabrication shop as specified in this Section. Refer to Division 09 painting Sections for finishing opaque-finished architectural woodwork.

C. Shop Priming: Shop apply the prime coat including backpriming for transparent-finished items specified to be field finished. Refer to Division 09 painting Sections for material and application requirements.

D. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.

1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions before interior finishes are installed, with architectural cabinet Installer present:

1. Verify that backing or backing is provided in all locations required for architectural cabinet installation and identify locations where blocking or backing is missing or improperly located.

2. Verify that rough-ins for facilities services are located to avoid conflict with architectural cabinets, equipment and items installed in architectural cabinets, including, but not limited to, appliances, water heaters, and specialty items.

B. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and back-priming.

3.3 CABINET INSTALLATION

A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.

C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims.
1. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

D. Scribe and cut cabinet trim to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.

F. Anchor cabinet work to blocking or backing built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed fastening, countersunk and filled flush with wood cabinet work and matching final finish if transparent finish is indicated.

G. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.

   1. Install cabinets with no more than 1/8 inch in 96 inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.

   2. Fasten wall cabinets through back, near top and bottom, at ends using fastener type, size, location and maximum spacing as shown in Woodwork Institute Casework Fastener Schedule, except if not shown otherwise, then at a minimum of 16 inches (400 mm) o.c. with No.10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

   3. Maintain veneer sequence matching of cabinets with transparent finish.

H. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

3.4 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean woodwork on exposed and semi exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

- END OF SECTION -
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes glass-fiber reinforced plastic (FRP) wall paneling and trim accessories.

1.3 RELATED REQUIREMENTS
A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements”.
C. Section 09 2900 “Gypsum Board” for substrate material.

1.4 REFERENCES
A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CAL-Green”.
C. ASTM International:

1.5 SUBMITTALS
A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include manufacturer's specifications and installation instructions for each material and accessory.
B. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers; documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
C. Shop Drawings: Show location and dimension of joints and fastener attachments.
D. Samples: Submit specified color and texture sample of wall panel and trim pieces for verification.
E. Closeout Submittals:
   1. Submit cleaning and maintenance instructions.

1.6 QUALITY ASSURANCE
A. Source Limitations: Obtain plastic panels from single source from single manufacturer to ensure warranty and color match.

1.7 DELIVERY, STORAGE AND HANDLING
A. Comply with requirements of Section 01 6000.
B. Deliver materials clearly labeled to identify Manufacturer, brand name, quality or grade and fire hazard classification.
C. Store horizontally in original undamaged packages.
D. Remove foreign matter from face of panel with soft bristle brush, avoiding abrasive action.

1.8 PROJECT/SITE CONDITIONS
A. Environmental Requirements: Install materials when temperature and humidity conditions approximate conditions that will exist when building is occupied.
B. Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

1.9 EXTRA MATERIALS

A. Supply two percent of each type used, two sheets minimum in clean condition, marked for Owner's use. Material must be in manufactures package, unopened.

B. Supply 10% of each type of moldings. Moldings must be packaged in a round tube to be sealed on both ends to protect the moldings from damages. Container must identify the quantity and type of each piece.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Fire-Test-Response Characteristics: Provide wall panels and adhesives with the following fire-test-response characteristics as determined by testing identical products applied with identical adhesives to substrates per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Surface-Burning Characteristics: As follows, Class I per ASTM E 84:
   a. Flame-Spread Index: 25 or less.
   b. Smoke-Developed Index: 450 or less.

2.2 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products.

1. Glasbord® with Surfaseal manufactured by Crane Composites, Channahon, IL; tel: (800) 435-0080; web: www.cranecomposites.com.


3. FiberLite™ FRP manufactured by Nudo, Springfield, IL; tel: (800) 826-4132; web: www.nudo.com.

2.3 MATERIALS

A. Panels and Accessories: Provide the following.

1. Fiberglass reinforced plastic, 0.09 inches thick, minimum. Product shall meet or exceed the following:

<table>
<thead>
<tr>
<th>Property</th>
<th>ASTM Test</th>
<th>Method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexural Strength</td>
<td>D 790</td>
<td>1.0 x 10^4 psi</td>
<td></td>
</tr>
<tr>
<td>Flexural Modulus</td>
<td>D 790</td>
<td>3.1 x 10^5</td>
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Coefficient of Lineal Thermal Expansion

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3. Color: As selected by Architect from manufacturer’s full range.

B. Adhesive: Manufacturer's recommended type for use with selected materials, waterproof, mildew resistant non-staining type.

C. Sealant: Latex type as approved by adhesive and wall paneling manufacturer.

D. Moldings:
   1. Use extruded aluminum molding trim pieces at internal and external corners, including end cap molding.
   2. Use plastic molding at panel divisions.

E. Miscellaneous Items: Furnish and install supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation, whether or not specified or indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrate and conditions under which the material is to be installed.

B. Verify that nails and screws are recessed, with joints and depressions taped, finish and sealed.

C. Remove contaminants from areas to be covered.

D. Do not proceed with Work until work of other trades which passes through wall covering has been completed and unsatisfactory conditions have been corrected.

E. Start of Work indicates acceptance of responsibility for performance and any required remedial Work.

3.2 INSTALLATION

A. Install panels in accordance with manufacturer's printed instructions using full sheet mastic coverage method with no exposed fasteners or "buttons."

B. Install panels as indicated. If not indicated install in vertical format and cut panels at inside corners. Arrange panels so that no panel is less than 1/2 panel size.
C. Where applicable, align top of panel and trim with top of adjacent door frames.

D. Where applicable, install paneling before installation of plumbing, casings, bases, cabinets and other items to be applied over paneling.

E. Remove plumbing escutcheons, switchplates, wall plates, and surface-mounted fixtures, and cut wall paneling evenly to fit. Replace items after completion of Work.

F. Make joints with 1/8 inch space for expansion and use moldings designed for each condition for the Project.

G. Bevel edges of panels with block plane to permit proper fit into moldings.

3.3 CLEANING AND PROTECTION

A. Remove excess adhesive and smudges with soft cloth and mineral spirits, or with product recommended by wall panel manufacturer.

B. Protect plastic wall panels from damage until Substantial Completion.

- END OF SECTION -
# DIVISION 07 – THERMAL AND MOISTURE PROTECTION

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- SECTION 07 2633 -

MOISTURE MITIGATION CONTROL COATING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes Moisture Mitigation Control Coating.
   1. Liquid applied, epoxy resin based moisture control system for interior substrates specified to receive moisture sensitive, adhesive applied, floor coverings.
   2. Cementitious leveling underlayment applied over moisture mitigation epoxy coating as required by specific flooring adhesive to be used at each finish flooring condition.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements.”
C. Division 09 Sections specifying concrete floor surface preparation.
D. Division 09 Sections specifying floor moisture and pH testing.
E. Division 09 floor covering Sections, for installation requirements and to verify compatibility to the manufacturer’s adhesives.

1.4 REFERENCES

C. ASTM International:
5. ASTM D 4258 - Standard Practice for Surface Cleaning Concrete for Coating.
6. ASTM D 4259 - Standard Practice for Abrading Concrete.

D. International Concrete Repair Institute (ICRI):
1. ICRI Technical Guideline No. 310.2R, Selecting and Specifying Concrete Surface Preparation for Coatings, Sealers, and Polymer Overlays.

1.5 DEFINITIONS

A. Moisture Vapor Control System: A sequence of products applied on a concrete floor to isolate moisture and high pH in the concrete for adhesive applied finish floor coverings, complying with requirements of ASTM F 3010.

B. Moisture Vapor Control Coating: Barrier coating applied on concrete floor that acts as the primary barrier to moisture movement.

C. Primer: One-component water-based liquid designed to bond to Moisture Vapor Control Coating and cementitious patching/leveling compounds.

D. Underlayment: Trowelable or pourable patching/leveling compound to which the finish floor covering is adhered. Underlayment is installed on top of the Moisture Vapor Control Coating or primer.

1.6 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include detailed installation requirements, spread rates, joint and crack treatment and final barrier surfaces for floor coverings.
   2. Pail Labels: Collect and submit each original pail label of Moisture Mitigation Control System Coating installed.
      a. Copies are not acceptable.
C. CAL-GREEN Submittals:
   1. Product Data - VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low/No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

D. Shop Drawings: Floor Plans, indicating areas of installation, sequencing, and total area of installation in square feet.

E. Manufacturer Certification: Provide letterhead documentation of complete review of concrete mix designs, admixtures, sub-slab vapor retarder installation and curing methods with written acceptance prior to installation.

F. Installer Proof of Qualification: Factory licensed, approved or certified applicator certificate signed by the manufacturer.

G. Independent Laboratory Test Reports: For performance documentation of Moisture Vapor Control System.
   1. Water vapor transmission by ASTM E 96 (water method) or ASTM D 1653, indicating a maximum 0.1 perms for coating on concrete.
   2. No loss in moisture-resistance properties for a period of ten years of exposure to continuous water contact and pH greater than 10 after final cure.

H. Qualification Data: For Manufacturer and Installer.

I. Sample Warranty: As specified.

J. Closeout Submittals:
   1. Submit under provisions of Section 01 7700S.
   2. Warranty: Submit executed warranty.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. Company specializing in manufacturing water vapor reduction and alkalinity control reduction system products specified in this Section with minimum ten (10) years documented experience.
      a. The moisture vapor and alkalinity control reduction system must be specifically formulated and marketed for water vapor reduction and alkalinity control without change of system design or formulation for a minimum of five (5) years.

B. Installer Qualifications:
   1. Installer with not less than five (5) years of experience installing the specified coating systems.
   2. Installer trained by the manufacturer or certified in accordance with manufacturer’s specific warranty requirements.
   3. Installer experienced in surface preparation and application of specified materials.
C. Source Limitations: Provide materials approved by one Moisture Vapor Control System manufacturer including primers, coatings, and underlayment leveling/patching compounds for use above Moisture Vapor Control Coating.

D. Pre-Installation Testing:
1. Document that floor and building conditions are within acceptable limits of temperature, relative humidity, and concrete condition before proceeding with substrate preparation and product application.
2. File a pre-installation checklist with the manufacturer and receive written confirmation of approval to proceed to support manufacturer's warranty.

E. Pre-Installation Conference: Conduct at Project site.

F. Pre-installation Testing:
1. Document floor and building conditions are within acceptable limits of temperature, relative humidity, and concrete condition before proceeding with substrate preparation and product application.
2. File a pre-installation checklist with the manufacturer and receive written confirmation of approval to proceed to support manufacturer's warranty.

G. Mockup: Provide a mockup for evaluation of surface preparation techniques and moisture mitigation system application workmanship.
1. Mockup area of at least 200 square feet in location approved by Architect and Owner.
   a. Include a 25 square feet area that illustrates the floor preparation without the coating applied.
2. Mockup Bond Tests: Perform tensile bond tests in triplicate on a 100 square foot minimum area on mockup, no sooner than 72 hours after installation is completed, according to ASTM D 7234 through entire Moisture Mitigation Control System Coating into concrete substrate. Comply with the following:
   a. No cohesive failure of leveling underlayment with at least 200 psi, or tensile failure in concrete substrate with no inter-layer or intra-layer failure of Moisture Mitigation Control System Coating.
   b. If failure occurs, determine cause and method(s) to avoid further unacceptable work.
      1) Remove and re-apply mock-up area as required to produce acceptable work.
      2) Do not proceed with installation of moisture mitigation system until bond test results meet requirements above and are acceptable to Moisture Mitigation Control System Coating manufacturer.
      3) Repair all areas where testing was done.
3. Do not proceed with work until mockup workmanship and underlayment surface appearance are approved by manufacturer's representative and Architect.

H. Products based on silicate chemistry, potassium, sodium, lithium, and similar formulations, water-based acrylics or water-based moisture mitigation systems are not acceptable and will be rejected.

I. Manufacturer shall provide independent laboratory test reports documenting the Performance criteria for the product as specified.

J. Installer shall coordinate with contractor regarding all treatments applied to concrete surfaces for compatibility with system, including but not limited to silicates and oils.
K. Applicator shall be responsible for acceptance of concrete prior to installation of coating system.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver products to the job site in their original unopened containers, clearly labeled with the manufacturer’s name and brand designation.

B. Store products in an approved ventilated dry area; protect from dampness, freezing, and direct sun light.
   1. Do not store in areas with temperatures in excess of manufacturer’s written instructions.

C. Handle product in a manner that will prevent breakage of containers and damage products.

D. Use products before manufacturer’s expiration dates.

1.9 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits required by moisture mitigation system manufacturer.

B. Do not apply Moisture Mitigation Control System Coating to concrete surfaces which have not been prepared to accept coating.

C. Do not apply Moisture Mitigation Control System Coating to unprotected surfaces or when moisture is present on the surface of the concrete.

D. Do not apply Moisture Mitigation Control System Coating when air or floor temperature is lower than 50 degrees F (10 degrees C) or expected to fall below this temperature within 24 hours from time of application.

E. Install Moisture Mitigation Control System Coating only when concrete floor surface temperature is at least 5 degrees Fahrenheit above the dewpoint temperature of the air over the floor. Maintain and document coated floor surface temperature at least 5 degrees Fahrenheit above air dewpoint temperature for at least 24 hours after application.

F. Allow continuous ventilation and air movement at all times during application and curing process of the moisture mitigation system.

G. Protect work to prevent damage that will affect performance and the finished underlayment surface.

1.10 WARRANTY

A. Extended Warranty: Warranty provides, at Owner’s option, repair or replacement of the Moisture Mitigation Control System Coating and flooring damaged due to failure of the Moisture Mitigation Control System Coating during the fifteen (15) year warranty period. Warranty definition of damage includes at least the following:
   1. Distress of flooring caused by moisture including but not limited to the following:
      a. Adhesive deterioration resulting in loss of flooring bond to the floor.
b. Formation of bubbles, mole trails, lumps, bumps, seam separation, or other significant displacement that interferes with the intended use of the flooring.

2. Distress of the Moisture Mitigation Control System Coating including but not limited to the following:
   a. Deformation of approved patching/leveling compounds installed under the Moisture Mitigation Control System Coating.
   b. Adhesive or cohesive failure of Moisture Mitigation Control System Coating components.
   c. Distress of underlayment above the Moisture Mitigation Control System Coating such as delamination, disbanding, expansion, chemical reaction, or other deformation or displacement that interferes with the intended use of the flooring.

B. Warranty coverage commences on the date of completion of finish flooring installation.

C. Warranty includes the replacement of Moisture Mitigation Control System Coating, flooring system, patching compounds, installation accessories flooring materials and labor costs.
   1. Warranty does not exclude or become void due to cohesive substrate failure in the concrete surface due to normal concrete movement.
   2. Warranty does not exclude or become void due to existing substrate as installation of Moisture Mitigation Control System Coating indicates acceptance of site conditions.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Moisture and Alkalinity: Remain tolerant to alkalinity of 14 pH in a 14 day bath test per ASTM D 1308 and to 100 percent relative humidity per ASTM F 2170.
   1. No loss in moisture-resistance properties for a period of fifteen (15) years of exposure to continuous water contact and pH greater than 8 after final cure of installed system.

C. Water Vapor Transmission: Maximum 0.1 net perms (grains/hr/sq ft/per 1 inch Hg) water vapor transmission per independent testing in accordance with ASTM E 96, water method.

D. Mold Resistance: Resistant to mold, mildew and biological growth when applied to prepared substrates.

E. Flooring Compatibility: Coating to be compatible with all types of floor covering products.

2.2 MANUFACTURERS

   1. VAP I 2000 Zero VOC, twelve hour cure time to final flooring.
B. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:
   1. AC Tech 2170® FC ZERO System by ALLIED Construction Technologies, Inc.,

C. Substitutions: Not permitted.

2.3 SYSTEM DESCRIPTION

A. It is the intent of this Section to require a complete stand-alone barrier system by one manufacturer with no requirements for additional components such as sand broadcast for adhesion of flooring systems.

B. Moisture Vapor Control System containing 100 percent epoxy resin solids in a single coat system. Multi-coat systems are not acceptable.

C. Comply with product requirements of ASTM F 3010.
   1. Non-corrosive, low viscosity, high gloss, microbial resistant, moisture-alkaline resistant barrier coating to suppress, control and mechanically restrict water emission and pH level of concrete substrates for compliance with subsequent floor coverings or coating materials.

D. Moisture Vapor Control Coating: Epoxy resins and other chemical compounds, specifically formulated chemicals and resins to provide the following properties.
   1. Solid Content: 100 percent.
   2. VOC, mixed: 0 g/L.
   3. Flash Point: 200 degrees F.

E. Expansion Joint Treatment: By coating manufacturer or approved by coating manufacturer and type recommended to suit site conditions.

F. Non-Moving Crack Treatment: By coating manufacturer or approved by coating manufacturer and type recommended to suit conditions indicated.

G. Self-Leveling Primer: By coating manufacturer or approved by coating manufacturer and type recommended to suit site conditions.
      a. Applied over Moisture Vapor Control Coating prior to installation of underlayment.

H. Self-Leveling Underlayment: By coating manufacturer or approved by coating manufacturer and type recommended to suit site conditions.
      a. Compressive Strength: 4,350 psi per ASTM C 349 at 28 days.
      b. Flexural Strength: 870 psi per ASTM C 348 at 28 days.
      c. Tensile Strength: Greater than 144 psi per ASTM D 7234 at 28 days.
I. Surface Treatment for Concrete Contaminated with Soluble Silicates: By Coating manufacturer or approved by coating manufacturer and type recommended to suit conditions indicated.
   1. Basis of Design for KOSTER System: KOSTER IB.
      a. Apply to contaminated concrete prior to Vapor Emission Control System Sealer application

PART 3 - EXECUTION

3.1 EXAMINATION

   A. Examine substrates with Installer present for compliance with requirements for surface contamination, damage, and other conditions affecting performance of the Work
      1. Verify substrate conditions are acceptable for a warranted system.
      2. Verify new concrete floors have cured minimum 28 days.
      3. Verify removal of dirt, oils, films, and other materials detrimental to sealer application.
      4. Verify concrete cleaned by shot blasting or other mechanical abrasion is not excessively rough for sealing at specified Moisture Vapor Control Coating application rates.
      5. Verify items which penetrate concrete substrate to receive coating are securely installed and coating installation will not affect proper installation and warranty requirements.

   B. Examine substrate to determine if any repairs are required to restore substrate surface to be within tolerances required for floor finishes specified in other Sections, prior to completing Work of this Section.
      1. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of Moisture Vapor Control System with recommendations for methods and materials required to correct conditions before proceeding with work of this Section.

   C. Proceed with surface preparation only after unsatisfactory conditions have been corrected.
      1. Proceeding with surface preparations indicates acceptance of surfaces and conditions of substrate.

3.2 PRE-INSTALLATION TESTING

   A. Concrete Slab Moisture and pH Testing: As specified in related Section 09 0512.
      1. Owner to engage an Independent laboratory firm to perform testing of all concrete slabs (on grade and elevated) in accordance with ASTM F 2170, no sooner than 45 days prior to the installation of the finished flooring, scheduled to receive adhered floor coverings.

3.3 PREPARATION

   A. Protection: Mask and protect walls, doors, equipment, adjacent work and finishes during installation process.

   B. Surface Preparation:
      1. Mechanically clean concrete substrate in accordance with ASTM D 4259 to remove surface and penetrating contaminates and to produce a surface profile of CSP 3 or CSP 4 in accordance with ICRI Technical Guideline No. 310.2R.
a. Acceptable methods include shotblasting, scarifying or grinding. Grinding is only acceptable in locations unreachable by shotblast or scarification equipment.
b. Do not acid etch concrete surface.
c. Do not apply water to concrete surface.

2. Acceptable substrate surfaces will be free of laitance, oil, grease, flooring adhesive, paint, and other surface contaminants affecting bond of Moisture Vapor Control System.

3. If concrete floor develops areas of surface roughness greater than ICRI CSP-5 during preparation, apply patching/leveling compound in those areas and re-abrade to produce specified profile.
   a. Excessively rough concrete cannot be adequately sealed at specified Moisture Vapor Control Coating application rates.
   b. Confirm with Moisture Vapor Control System manufacturer for conditions where floor roughness can be repaired after coating has been installed.

4. Concrete Fiber Reinforcement: If present after shot blasting, shall be burned off, scraped and vacuumed, leaving no fibers protruding from the concrete surface.

C. When field quality control report indicates portions of substrate are unsatisfactory, repeat process until field quality control report indicates there are no unsatisfactory portions remaining.

D. Surface Irregularities, Joints and Cracks: Use manufacturer’s crack repair compound as follows.
   1. Fill bugholes, spalls, cracks, construction joints, sawcut control joints, surface irregularities, deteriorated joints and other surface damage exposed or created as a result of substrate cleaning operations flush with adjacent surfaces to provide sound substrate for specified floor finish.
   2. Follow manufacturer’s recommendations for routing cracks with diamond abrasive wheel to not more than 1-1/8 inch to 1-1/4 inch depth.
   3. Vacuum clean to remove dust and residue.
   4. Mix and apply crack repair compound according to manufacturer’s instructions.
   5. Scrape or lightly grind flush after curing if required by manufacturer to provide a level surface for Moisture Vapor Control Coating.

E. Dry broom or vacuum clean concrete substrates in accordance with ASTM D 4258 immediately before application of Moisture Vapor Control System to remove loose materials on substrate surface.

3.4 MIXING

A. Use clean containers and mix thoroughly as per manufacturer’s requirements to obtain a homogeneous mixture.

B. Do not aerate the material when mixing.

C. Mix ratios in accordance with manufacturer’s written instructions.

3.5 INSTALLATION

A. Apply Moisture Vapor Control Coating where relative humidity and alkalinity tests do not meet flooring manufacturer’s requirements for scheduled floor finishes.
B. Moisture Vapor Control Coating Application:
   1. Apply to a form a continuous monolithic void-free application.
   2. Coverage rates are dependent on the surface texture and porosity of the substrate.
   3. Apply Moisture Vapor Control Coating at recommended rate per square foot to thickness required to meet the specified perm rating.
   4. Apply sufficient coating to achieve the manufacturer's recommended minimum film thickness using manufacturer's recommended squeegee or roller. Periodically check application rate and wet film thickness. Allow for manufacturer's recommended curing times.
   5. Treat pin holes and other coating surface deficiencies as directed by manufacturer.

C. Joints: Expansion joints, isolation joints or other moving joints in the concrete substrate must not be filled or sealed with rigid materials. All moving joints must be preserved up through the Moisture Vapor Control System.

D. Cementitious Underlayment Installation:
   1. Apply primer to Moisture Vapor Control Coating.
   2. Do not exceed manufacturer's recommended application rate and film thickness. Thicker primer can lead to cracking of underlayment.
   3. Allow for manufacturer's specified cure time.
   4. Do not exceed manufacturer's specified open time.
   5. Mix and pour the underlayment product on the floor and disperse with approved spreader, followed by smoothing material with approved smoother.
   6. Wear cleated shoes to avoid leaving marks.
   7. Do not exceed maximum application thickness specified by underlayment manufacturer. Provide a smooth, uninterrupted, level finish without bumps, clumps, depressions, or other defects that would reflect through applied resilient sports flooring.
   8. Floor finish shall be flat to within 1/8 inch in 10 feet, and as measured by ASTM E 1155.
      a. Provide F_F of 50 and F_L of 30.

3.6 DEFECTIVE WORK

A. Inspect and repair defects.
   1. Inspect hardened underlayment for flatness.
   2. Lightly sand flat any bumps in the underlayment. Un-hydrated or partially hydrated clumps of underlayment cement shall be removed by carefully chiseling and patching with compatible trowel-applied patching compound recommended by underlayment manufacturer. Do not penetrate the Moisture Vapor Control Coating.
   3. Fill low spots with compatible trowel-applied patching compound recommended by underlayment manufacturer. Sand smooth to remove trowel marks.

B. Allow surfaces to cure and re-apply additional coats as required to form a uniform control layer.

C. Maintain environmental conditions required by coating manufacturer throughout the curing period.
3.7 FIELD QUALITY CONTROL

A. Moisture Vapor Control System manufacturer and installer to guarantee installed system is compatible with all specified floor coverings and adhesives.

B. Quality Control Testing and Observation: Owner's Testing Agency to perform the following:
   1. Visual inspection of completed substrate preparation to verify contamination is removed.
   2. Visual inspection of completed substrate preparation to verify surface profile matches ICRI profile required for specified coating or finish, using ICRI standard rubber mold for visual comparison.
   3. Prepare field quality control report. Clearly indicate the locations, extents, and conditions of areas where surface preparation does not conform to specified profile and cleanliness. Document observed conditions with digital photographs.
   4. Repeat inspections when additional surface preparation for unsatisfactory conditions indicated in the previous field quality control report.
   5. Verify that Moisture Vapor Control System film thickness meets manufacturer's recommended minimums.
   6. Verify that repairs of defective locations of the Moisture Vapor Control System are made according to the manufacturer's recommended requirements.

3.8 CLEANING AND PROTECTION

A. Remove all debris resulting from Moisture Vapor Control System installation from project site.

B. Protect prepared concrete substrates from contamination and damage due to traffic and topical water during required cure period until acceptance by floor covering installer.

C. Recoat substrates that are contaminated or damaged by construction operations prior to installation of floor finishes specified in related Sections.
   1. Make all repairs and replacements necessary to the approval of the Architect and Moisture Vapor Control System manufacturer at no additional cost to the Owner.

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Roof hatch railing systems / assembly sized to fit existing hatch.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

G. Section 09 9600 “High Performance Coatings” for painting unfinished roof accessories.

1.4 REFERENCES


C. ASTM International:
   1. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.


F. The Coatings Society (SSPC):

1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated. Include construction details, materials, dimensions of individual components and profiles, and finishes.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low / No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

D. Shop Drawings:
   1. Hatch Railings: Show fabrication and installation details. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other Work.
      a. For items to fit existing conditions, show field-verified dimensions of existing conditions on shop drawings.

E. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

1.6 QUALITY ASSURANCE

A. Standards: Comply with the following:
   1. SMACNA’s "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
   2. NRCA’s "Roofing and Waterproofing Manual" details for installing units.

B. The Manufacturer or his representative on request will inspect the completed installation and report in writing that the design requirements meet with the Manufacturer’s approval.
1.7 PROJECT CONDITIONS

A. Verify that other trades with related work are complete before installing roof hatch and rail system. Coordinate installation with roof membrane and roof insulation manufacturer’s instructions.

B. Refer to the Construction Documents, shop drawings, and manufacturer’s installation instructions.

C. Mounting surfaces shall be straight and secure; substrates shall be of proper width.

D. Observe all appropriate OSHA safety guidelines for this work

E. Coordinate layout and installation of roof accessories with interfacing and adjoining construction to provide a leak-proof, weather-tight, secure, and non-corrosive installation.
   1. With Architect’s approval, adjust location of roof accessories that would interrupt roof drainage routes.

1.8 WARRANTY

A. Provide manufacturer’s standard warranty.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

2.2 HATCH RAIL SYSTEM

A. Furnish and install where indicated on Drawings hatch rail system Bil-Guard 2.0 Model RL-S, or as required to fit existing roof hatch and meet all performance requirements in this Article as manufactured by Bilco Co. or approved Substitution. The hatch rail system shall be field assembled and installed per the manufacturer’s instructions on to the existing roof hatch.
   1. Existing Hatch Size: As indicated on Drawings, if no size is indicated, assume 36 inch by 30 inch hatch and verify actual size in field prior to making submittals or ordering products.

B. Performance characteristics:
   1. High visibility safety yellow color shall be molded in.
   2. Hatch rail system shall attach to the cap flashing of the roof hatch and shall not penetrate any roofing material.
3. Hatch rail system shall satisfy the requirements of OSHA 29 CFR 1910.23 and shall meet OSHA strength requirements with a factor of safety of two.
4. UV and corrosion resistant construction with a twenty-five year warranty.
5. Self-closing gate shall be provided with hatch rail system.

C. Posts and Rails: Shall be round pultruded reinforced fire retardant yellow fiberglass treated with a UV inhibitor.

D. Hardware: Mounting brackets shall be 1/4-inch thick hot dip galvanized steel. Hinges and post guides shall be 6063T5 aluminum. Fasteners shall be Type 316 stainless steel.

2.3 LADDER ASSIST POST
A. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to access ladders and/or roof-access ladder.
   1. Operation: Post locks in place on full extension; stainless steel release mechanism returns post to closed position.
      a. LU-1 Steel with yellow powder coated finish.

2.4 MATERIALS
A. Galvanized Steel Sheet: ASTM A 653, G90 coated.
B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792, Class AZ50 coated.
C. Insulation: Manufacturer's standard rigid or semi-rigid glass-fiber board of thickness indicated.
D. Fasteners: Nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
   1. Where removing exterior exposed fasteners affords access to building, provide non-removable fastener heads.
E. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.

2.5 FINISHES, GENERAL
A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 GALVANIZED STEEL SHEET FINISHES

A. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.


B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply the air-dried primer specified below immediately after cleaning and pretreating.

1. Shop Primer: Exterior galvanized metal primer per Division 9 Section "Exterior Painting."

2.7 ACCESSORIES

A. Elastomeric Sealant: ASTM C 920, silicon sealant; of type, grade, class, and use classifications required to seal joints in roof specialties and trim and remain watertight, recommended by sheet metal manufacturer and fabricator of components being sealed, complying with requirements specified in Division 7 Section "Exterior Façade Sealants".

B. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement, complying with requirements specified in Division 7 Section "Exterior Façade Sealants".

C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2; not less than 1-1/2 -inch thick.

D. Roofing Cement: ASTM D 4586, non-asbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

E. Bituminous Coating: Bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coating.

1. Comply with Section 01 6116.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances, clearances, and other conditions affecting performance of work.
B. Determine size and configuration of existing roof hatch to ensure provision of the correct type of railing.

C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide protective boards or other means to protect existing roof membrane from damage during installation of roof accessories.

3.3 INSTALLATION

A. Install products according to manufacturers' written instructions, using bolts, plates, and approved type fasteners appropriate to substrate indicated and recommended by unit manufacturer to ensure that each element of the Work performs as intended and that combined elements are waterproof and weathertight.

1. Anchor roof accessories securely to supporting structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.

2. Install units level, plumb, and firmly anchored in locations and at heights as required by referenced workplace safety regulations.

B. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent separation.

3.4 CLEANING AND PROTECTION

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 09 9600.

C. Clean other exposed surfaces according to manufacturer's written instructions. Remove excess sealants.

D. Touch up damaged shop-applied finish coatings with compatible materials.

E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

- END OF SECTION -
- SECTION 07 8413 -

PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes:
1. Through-penetration firestopping in fire rated construction for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
2. Blank openings through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
4. Openings and penetrations in fire-rated partitions or walls containing fire doors.
5. Openings around structural members which penetrate floors or walls.
6. Construction-gap firestopping at connections of the same or different materials in fire rated construction.
7. Construction-gap firestopping occurring within fire-rated wall, floor or floor-ceiling assemblies.
8. Construction-gap firestopping occurring at the top of fire rated walls.

B. Refer to Drawings for specific penetration assemblies.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 07 2100 “Thermal Insulation” for fire safing insulation.

D. Section 07 9200 “Joint Sealants.”
E. Section 09 2900 “Gypsum Board.”

F. Fire Suppression Drawings for fire-suppression-related penetrations.

G. Plumbing Drawings for plumbing-related penetrations.

H. HVAC Drawings for HVAC-related penetrations.

I. Division 26 “Electrical.”

1.4 REFERENCES

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


C. ASTM International:
   4. ASTM E 2174 - Standard Practice for On-site Inspection of Installed Fire Stops.
   5. ASTM E 2837 - Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies.


F. Underwriters Laboratories, www.ul.com
      a. Firestop Devices (XHJ).
      b. Fire Resistance Ratings (BXRH)
      c. Through-Penetration Firestop Systems (XHEZ).
      d. Fill, Voids, or Cavity Material (XHHW).
      e. Forming Material (XHKU).
      f. Through-Penetration Firestop Devices (XHCR).
      g. Fire Resistance Ratings (BXUV).
      h. Fill, Void, or Cavity Material (XHHW).
      i. Continuity Head-of-wall Joint Systems (XHBO).
5. Warnock Hersey.

1.5 DEFINITIONS

A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.

B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.

C. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.

D. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.

E. Construction Gaps: Gaps between adjacent sections of walls, exterior walls, at wall tops between top of wall and ceiling, and structural floors or roof decks; and gaps between adjacent sections of structural floors.

F. System: Specific products and applications classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.

G. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other Sections and may or may not be required.

1.6 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

1. Certification by firestopping manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs) and are nontoxic to building occupants.

2. Manufacturer's specifications and technical data for each material including the composition and limitations; documentation of qualified firestop systems to be used and manufacturer's installation instructions to comply with Division 01 Section “Submittal Procedures.”

C. CAL-GREEN Submittals:

1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116 “Volatile Organic Compound (VOC) Restrictions”.
D. Manufacturer's engineering judgment identification number and drawing details when no qualified tested system is available for an application.
   1. Engineering judgment must include both project name and contractor’s name who will install firestop system as described in document.

E. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.
   1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

F. Shop Drawings: Provide shop drawings detailing materials, installation methods, and relationships to adjoining construction for each through-penetration firestop system, and each kind of construction condition penetrated and kind of penetrating item. Include firestop design designation of qualified testing and inspecting agency evidencing compliance with requirements for each condition indicated.
   1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop configuration for construction and penetrating items.

G. Informational Submittals:
   1. 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.
   2. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.
   3. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.
   4. Product test reports from, and based on tests performed by, a qualified testing and inspecting agency evidencing compliance of firestopping with requirements based on comprehensive testing of current products.
   5. Product certificates signed by manufacturers of firestopping products certifying that their products comply with specified requirements.

H. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.
   2. Warranty: Submit specified warranty.

1.7 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain through-penetration firestop systems for each kind of penetration and construction condition indicated from a single manufacturer.
   1. Single manufacturer for all penetrations requiring firestopping.

B. For those firestop applications that exist for which no qualified tested system is available through a manufacturer, an engineering judgment derived from similar qualified tested system
designed or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation.

1. Engineering judgment documents by product manufacturer must follow requirements set forth by the International Firestop Council.

C. Installer Qualifications: Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary experience, staff, and training to install manufacturer's products per specified requirements. A manufacturer's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

1. Prior to installing fire stop assemblies, the installer shall furnish the Architect with written proof of qualification from the manufacturer of the fire stop material, certifying that the installer has satisfactorily completed technical and installation training for the specified products.

2. The manufacturer of the fire stop material shall, at no cost to the Owner or the Architect, provide sufficient inspections of installed systems to assure that all criteria required by the Project and by code are accomplished to the minimum standards shown in each UL system installed. The requirements of these Paragraphs are in addition to any requirement and/or field inspection requirements requested by the local authority having jurisdiction.

3. The work is to be installed by a contractor with at least one of the following qualifications:
   a. FCIA Member Specialty Firestop Contractor, FM 4991 Approved and inspected to meet ASTM E2174/2393 Protocol.
   b. UL Approved Contractor.
   c. Product manufacturers approved installer.

4. Firm with not less than (3) Three years experience with fire stop installation.

D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic.

1. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

A. Preinstallation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver firestopping products to Project site undamaged in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multi-component materials.

B. Store materials under cover and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

C. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
1.9 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. 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, frost, condensation, or other causes.

C. Ventilation: Ventilate firestopping per firestopping manufacturers’ instructions by natural means or, where this is inadequate, forced air circulation.

D. Install and cure penetration firestopping per manufacturer’s written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

E. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

F. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

G. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

1.10 SEQUENCING AND SCHEDULING

A. Notify Owner’s inspection agency at least 1 week in advance of firestopping installations; confirm dates and times on days preceding each series of installations.

B. Do not cover up those firestopping installations that will become concealed behind other construction until Owner’s inspection agency and authorities having jurisdiction, if required, have examined each installation.

1.11 COORDINATION

A. Coordinate construction of openings, penetrations and construction joints to ensure that the fire stop systems are installed according to specified requirements.

B. Coordinate fire stopping with other trades so that obstructions are not placed in the way prior to the installation of the fire stop systems.

C. Do not cover up through-penetration fire stop and joint system installations that will become concealed behind other construction until each installation has been examined by the building inspector.

D. Notify Owner’s testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

PART 2 - PRODUCTS

PENETRATION FIRESTOPPING

07 8413 - 6
2.1 PERFORMANCE REQUIREMENTS

A. VOC Limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.

C. Fire-Test-Response Characteristics: Provide firestopping that complies with the following requirements and those specified under the "System Performance Requirements" article:
   1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, Warnock Hersey, or another agency performing testing and follow-up inspection services for firestop systems that is acceptable to authorities having jurisdiction.
   2. Firestop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
   3. Through-penetration firestop systems are identical to those tested per ASTM E 814 under conditions where positive furnace pressure differential of at least 0.01 -inch of water is maintained at a distance of 0.78 -inch below the fill materials surrounding the penetrating items in the test assembly.
   4. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
   5. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
      a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
      b. Classification markings on penetration firestopping correspond to designations listed by the following:
         1) UL in its "Fire Resistance Directory".
         2) Intertek ETL SEMKO in its "Directory of Listed Building Products".
   6. Fire-resistive joint sealant systems are identical to those tested for fire-response characteristics per ASTM E 119 under conditions where the positive furnace pressure differential is at least 0.01 -inch of water, as measured 0.78 -inch from the face exposed to furnace fire. Provide systems complying with the following requirements:
      a. Fire-Resistance Ratings of Joint Sealants: As indicated by reference to designations listed by UL in their "Fire Resistance Directory" or by another qualified testing and inspecting agency.
      b. Joint sealants, including backing materials, bear classification marking of qualified testing and inspection agency.

D. Information on drawings referring to specific Design Designations of through-penetration firestop systems is intended to establish requirements for performance based on conditions that are expected to exist during installation.
   1. Any changes in conditions and designated systems require the Architect's prior approval.
   2. Submit documentation showing that the performance of proposed substitutions equals or exceeds that of the systems they would replace and are acceptable to authorities having jurisdiction.
E. Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy."

F. F-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.

G. T-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E 814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas.

H. L-Rated Through-Penetration Firestop Systems: The L Rating measures the amount of air that moves through an opening in cubic feet per minute per square foot of opening area, at ambient temperatures and 400F.
   1. The two temperature levels simulate cold and hot smoke moving in a building.
   2. Ratings are stated as cfm/sf, and are stated right below the F and T Ratings.
   3. An acceptable amount of air movement for a complete wall assembly has been established by NFPA 101 as .75 cfm/sf opening area.
   4. Many firestop systems have L Ratings of less than one.

I. Fire-Resistive Joint Sealants: Provide joint sealants with fire-resistance ratings indicated, as determined per ASTM E 119, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.

J. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.

K. For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450, as determined per ASTM E 84.

L. Firestop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

M. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

N. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

O. For those firestop applications that exist for which no qualified tested system is available through a manufacturer, an engineering judgment derived from similar qualified tested system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation.
   1. Engineering judgment documents by product manufacturer must follow requirements set forth by the International Firestop Council.
2.2 FIRESTOPPING, GENERAL

A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

B. Provide components for each firestopping system that are needed to install fill material.

1. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

2. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials

C. Penetrations in Fire Resistance Rated Walls: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. F-Rating: Not less than the fire-resistance rating of the wall construction being penetrated.

D. Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.

2. T-Rating: when penetrant is located outside of a wall cavity, minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.

E. Penetrations in Smoke Barriers: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures.

F. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of 0 as determined by ASTM G21.

G. Firestopping Materials are either “cast-in-place” (integral with concrete placement) or “post installed.” Provide cast-in-place firestop devices prior to concrete placement.

H. Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.

2.3 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide single source products by one of the following:


2.4 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
   1. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01 -inch wg (2.49 Pa).
   1. Fire-resistance-rated walls include fire walls, fire-barrier walls, smoke-barrier walls and fire partitions.
   2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
   1. Horizontal assemblies include floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.
   2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
   3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
   1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.

E. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
   1. Permanent forming/damming/backing materials, including the following:
      a. Slag-wool-fiber or rock-wool-fiber insulation.
      b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
      c. Fire-rated form board.
      d. Fillers for sealants.
   2. Temporary forming materials.
   5. Steel sleeves.
2.5 FILL MATERIALS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS

A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.
   1. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
   1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.

K. Safing: Mineral wool insulation at intersection of floor slabs and exterior walls and at intersection of fire-rated partitions and slabs above.
   1. Specified in Section 07 2100 “Thermal Insulation”.

2.6 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.
2.7 FIRESTOPPING ASSEMBLY MATERIALS

A. Use only firestop products that have been UL 1479 or ASTM E 814 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

B. Pre-installed firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and/or cable bundles penetrating concrete floors and/or gypsum walls, the following products are acceptable:

1. Hilti:
   a. Hilti (CP 681) Tub Box Kit - for use with tub installations.
   b. Hilti (CP 653) Speed Sleeve - for use with cable penetrations.
   c. Hilti (CFS-DID) Firestop Drop-In Device - for use with noncombustible and combustible penetrants.
   d. Hilti (CFS-BL) Firestop Block.
   e. Hilti (CP 680-P) Cast-In Place Firestop Device.
      1) Add Aerator Adaptor when used in conjunction with aerator system.

2. 3M:
   a. 3M Cast-In Device for Metal Pipes or Cables:
      1) 3M 2MCID.
      2) 3M 3MCID.
      3) 3M 4MCID.
      4) 3M 6MCID.
   b. 3M Cast-In Device for Plastic Pipes.
      1) 3M 2PCID.
      2) 3M 3PCID.
      3) 3M 4PCID.
      4) 3M 6PCID.
   c. 3M Fire Barrier Pass Through Devices, square or round, for use with cable bundles.
   d. 3M Fire Barrier Pass Through Putty Sleeve Kits.

3. STI:
   a. STI Series Cast-in Place Devices for metal and plastic pipes:
      1) STI CD2002 -inch diameter.
      2) STI CD3003 -inch diameter.
      3) STI CD4004 -inch diameter.
      4) STI CD6006 -inch diameter.
      5) STI CD200T - Tub Adapter.
      6) STI EZ Path 33 and 44 Series Devices for cabling in cores or block-outs.
      7) STI EZDP133FK.
         a) STI EZDP144FKS.
         b) STI EZDG444S.
      8) STI SSB Firestop Pillows.
C. Sealants, caulking materials, or foams for use with Penetrations by Non-Combustible Items, including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

1. Hilti:
   b. Hilti (CP 604) Self-leveling Firestop Sealant.
   c. Hilti (CP 620) Fire Foam.
   d. Hilti (CP 606) Flexible Firestop Sealant.
   e. Hilti (CP 601 S) Elastomeric Firestop Sealant.

2. 3M:
   a. 3M Fire Barrier FB3000WT, water tight sealant (up to 4 hour rated).
   b. 3M Fire Barrier FD150+ Flexible sealant.
   c. 3M Fire Barrier IC15WB+ (up to 3 hour rated).
   d. 3M Fire Barrier CP25 WB+ (up to 4 hour rated).
   e. 3M Fire Barrier FB1000 NS or FB1003 SL.

3. STI:
   a. STI LCI Intumescent Firestop Sealant (up to 4 hour rated).
   b. STI Endothermic Firestop Sealant (up to 3 hour rated).
   c. STI Silicone Firestop Sealant.
   d. STI CF34 Closet Flange.
   e. STI SSP Firestop Putty.

D. Penetrations by Combustible Items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe (closed piping systems):

1. Hilti:
   b. Hilti (CP 618) Firestop Putty.
   c. Hilti (CP 642) Firestop Jacket.
   d. Hilti (CP 643) Firestop Jacket.

2. 3M:
   a. 3M Fire Barrier IC15WB+ Sealant (up to 3 hour rated).
   b. 3M Fire Barrier CP25 WB+ Sealant (up to 4 hour rated).
   c. 3M Fire Barrier FS-195 Wrap/Strip, Ultra GS Wrap Strip, or Tuck-In Wrap Strip.
   d. 3M Fire Barrier FB3000WT, water tight sealant (up to 4 hour rated).

3. STI:
   a. STI LCI Intumescent Firestop Sealant.
   b. STI SSP Firestop Putty.
   c. STI SSWBLU2 SSWRED2 Wrap Strip.
   d. STI LLC or SSC Firestop Collars.
   e. STI CF34 Closet Flange.

E. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
1. **Hilti:**
   b. Hilti (CP 606) Flexible Firestop Sealant.
   c. Hilti (FS-ONE) Intumescent Firestop Sealant.

2. **3M:**
   a. 3M CP25WB+ Sealant.
   b. 3M IC15WB+ Sealant.
   c. 3M FB3000WT water tight Sealant.
   d. 3M Fire Barrier Pillows and 3M Fire Barrier Self Locking Pillows.

3. **STI:**
   a. STI LCI Intumescent Firestop Sealant.
   b. STI FryeFlange Duct Angle.
   c. STI SSB Intumescent Pillows.

F. **Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:**
   1. Hilti Intumescent Firestop Sealant (FS-ONE).
   2. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
      a. Hilti (FS-ONE) Intumescent Firestop Sealant.
      b. Hilti Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
         1) Hilti (FS-ONE) Intumescent Firestop Sealant.
         2) Hilti (CP 620) Fire Foam.
         3) Hilti (CP 601 S) Elastomeric Firestop Sealant.
         4) Hilti (CP 606) Flexible Firestop Sealant.
   4. **3M:**
      a. 3M CP25WB+ Sealant.
      b. 3M IC15WB+ Sealant.
      c. 3M FB3000WT water tight Sealant.
      d. 3M Fire Barrier Pillows and 3M Fire Barrier Self Locking Pillows.

5. **STI:**
   a. STI LCI Intumescent Firestop Sealant.
   b. STI SSP Firestop Putty.
   c. STI SSWBLU2 SSWRED2 Wrap Strip.
   d. STI LLC or SSC Firestop Collars.
   e. STI CF34 Closet Flange.

G. **Non-curing, re-penetrable, intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:**
   1. Hilti:
      a. Hilti (CP 618) Firestop Putty Stick.

2. 3M:
   a. 3M MPP+ Putty Stix.
   b. 3M MPP+ Putty Pads.

3. STI:
   a. STI SSP Firestop Putty/Putty Pads (not clay based).
   b. STI FP200/FP400 Firestop Plug.

H. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic J-Boxes for conditions such as: switches, data, power, etc. including, the following products are acceptable:
   1. Hilti:
      a. Hilti (CP 617) Firestop Putty Pad.
      b. Hilti Firestop Box Insert.
   2. 3M:
      a. 3M Firestop MPP+ Putty Pads.
      b. 3M Interam Endothermic Mat E05A-4.
   3. STI:
      a. STI SSP Firestop Putty/Putty Pads (not clay based).
      b. STI EP 44/45 Powershield Electrical Box Insert.

I. Fire-Rated Construction Joints and Other Gaps:
   1. Hilti:
      b. Hilti (CP 606) Flexible Firestop Sealant.
      c. Hilti (CFS-SP WB) Firestop Joint Speed Spray.
         1) Red.
         2) White.
         3) Grey.
   2. 3M:
      a. 3M Firestop Sealant 2000+.
      b. 3M Fire Dam Spray 200.
      c. 3M Fire Dam FD150+ Flexible Firestop Sealant.
      d. 3M Fire Barrier FB1000NS Sealant.
   3. STI:
      a. STI AS Elastomeric Spray.
      b. STI ES Elastomeric Sealant.
      c. STI LC Endothermic Sealant.
      d. STI Fast Track Silicone Firestop Spray.

J. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
   1. Hilti:
      a. Hilti (CP 642 Firestop Jacket.)
b. Hilti (CP 643N) Firestop Collar.
c. Hilti (CP 644) Firestop Collar.
d. Hilti (CP 648E/648S) Wrap Strips
e. Hilti (FS-ONE) High Performance Intumescent Firestop Sealant.

2. 3M:
   a. 3M Fire Barrier PPD Plastic Pipe Device.
   b. 3M Tuck-In Wrap Strip.
   c. 3M Ultra GS Wrap Strip.
   d. 3M FS195+ Wrap Strip.
   e. 3M IC15WB+ and FB3000WT for CPVC piping.
   f. 3M High Performance CP25WB+.

3. STI:
   a. STI LCI Intumescent Firestop Sealant.
   b. STI SSWBLU2 SSWRED2 Wrap Strip.
   c. STI LLC or SSC Firestop Collars.
   d. STI RTC Adjustable Firestop Collar.
   e. STI CF34 Closet Flange.

K. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti:
   a. Hilti (CP 637) Firestop Mortar.
   b. Hilti (CFS-BL) Firestop Block.
   c. Hilti (CP 620) Fire Foam.
   d. Hilti (CP 675T) Firestop Board.
   e. Hilti (FS 635) Trowelable Firestop Compound.
   f. Hilti FIRE BLOCK.

2. 3M:
   a. 3M Firestop Pillows and Self Locking Pillows.
   b. 3M Fire Barrier CS-195 Composite Sheet.
   c. 3M Fire Barrier Mortar.

3. STI
   a. STI SSB Firestop Pillows.
   b. STI CS Composite Sheet.
   c. STI SSM Firestop Mortar.

L. Non curing, re-penetrable materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti:
   a. Hilti (CFS-BL) Firestop Block.
   b. Hilti (CP 675 T) Firestop Board.

2. 3M:
a. 3M Firestop Pillows and Self Locking Pillows.
b. 3M Fire Barrier CS-195 Composite Sheet.

3. STI:
   a. STI SSB Firestop Pillows.
   b. STI CS Composite Sheet.

M. Re-penetrable, round cable management devices for use with new or existing cable bundles penetrating gypsum or masonry walls, the following products are acceptable:
   1. Hilti:
      b. Hilti (CFS-SL SK) Firestop Sleeve.
      e. Hilti (CFS-SL GP CAP) Gangplate Cap - for use at blank openings in gangplate for future penetrations.
   
   2. 3M:
      a. 3M Fire Barrier Pass Through Devices.
      b. 3M Fire Barrier Pass Through Putty Sleeve Kits.
   
   3. STI:
      a. STI EZ Path 33 and 44 Series Devices for cabling in cores or block-outs.
      b. STI EZ Path 33 Series Retrofit wall plate (EZDP33WR).
      c. STI EZ Path 44 Series Retrofit wall Plate (EZDP144RS).

N. For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected, the following products are acceptable:
   1. Hilti:
      a. Hilti (CFS-BL) Firestop Block.
   
   2. 3M:
      a. 3M Firestop Pillows and Self Locking Pillows.
      b. 3M Fire Barrier CS-195 Composite Sheet.
   
   3. STI:
      a. STI SSB Firestop Pillows.
      b. STI CS Composite Sheet.

O. Openings between Structurally Separate Sections of Wall and Floors, Tops-of-Walls:
   1. Hilti:
         1) Red.
         2) White.
         3) Grey.
      b. Hilti (CP 601 S) Elastomeric Firestop Sealant. (made in Germany)
      c. Hilti (CP 606) Flexible Firestop Sealant. (made in Germany)
      d. Hilti (CP 604) Self-Leveling Firestop Sealant. (made in Netherlands)
2. 3M:
   a. 3M Fire Barrier CP 25 WB.
   b. 3M FD150+.
   c. 3M FD 200 Elastomeric Spray.

3. STI:
   a. STI AS200 Series Elastomeric Spray.
   b. STI ES100 Elastomeric Spray.
   c. STI Endothermic Sealant.

P. Cast-in place firestopping of Through-Penetrations in Concrete Floors and Composite Concrete Decks, cast-in firestop devices with an integrated intumescent firestop, smoke and water seal:
   1. Hilti:
      a. Hilti (CP 680) Cast-In Firestop Device.
   2. 3M:
      a. 3M Fire Barrier Cast-In Device for Metal Pipes.
      b. 3M Fire Barrier Cast-In Device for Plastic Pipes.
   3. STI:
      a. STI CD Series Cast in Firestop Devices for Metal or Plastic Pipes.

Q. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E 814 which is equal to the time rating of construction being penetrated.

2.8 ACCESSORIES

A. Other materials Underwriters Laboratories Inc. (UL) or Warnock Hersey classified or listed as required to meet the appropriate firestop application.

B. High-melt-point mineral wool or ceramic fiber, unfaced: Master Products "FireMaster Bulk".
   1. ASTM E84: Flame Spread 0; Smoke Development 0; Fuel Contributed 0.
   2. Non-combustible in accordance with ASTM E136.

C. Gypsum board firestopping: ASTM C 36, Type X.

D. Sealant, Fire-Retardant: 3M "Fire Dam 150", Dow Corning "Firestop" 2000", or approved equal for required fire rating.
   1. Color as selected by Architect from manufacturer’s standards.

E. Calcium silicate board: Promadeck as manufactured by Promat Fire Protection division of Eternit, Blandon, PA.; thickness as noted on the Drawings or as required by the tested assembly.

F. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

G. Installation Accessories: Clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.


PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping.
   1. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
   1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping.
      a. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.
   4. Verify penetrations are properly sized and in suitable condition for application of materials.
   5. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
   6. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
   7. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
   8. Do not proceed until unsatisfactory conditions have been corrected.

B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains.
   1. Remove tape as soon as possible without disturbing firestopping's seal with substrates.
3.3 INSTALLATION


B. Manufacturer’s Instructions: Comply with manufacturer’s instructions for installation of through-penetration materials.
   1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
   2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
   3. Protect materials from damage on surfaces subjected to traffic.

3.4 INSTALLING FIRE-RESISTIVE JOINT SEALANTS

A. General: Comply with the "System Performance Requirements" as herein indicated, with ASTM C 1193, and with the sealant manufacturer’s installation instructions and drawings pertaining to products and applications indicated.

B. Install joint fillers to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.

C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint width that optimum sealant movement capability. Install sealants at the same time joint fillers are installed.

D. Tool nonsag sealants immediately after sealant application and prior to the time skinning or curing begins. Form smooth, uniform beads of configuration indicated or required to produce fire-resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.5 INSTALLING THROUGH-PENETRATION FIRESTOPS

A. General:
   1. Install penetration firestopping to comply with manufacturer’s written installation instructions and published drawings for products and applications indicated.
   2. Comply with the "System Performance Requirements" article as herein specified.

B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems.
   1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping systems.
C. Install fill materials for through-penetration firestopping systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.6 MARKING AND IDENTIFICATION

A. Fire Walls, Fire Barriers, Fire Partitions, Smoke Barriers, and Smoke Partitions and any other wall required to have protected openings or penetrations shall be effectively and permanently identified with stenciling conforming to the following requirements:

   a. Located in all accessible concealed floor, floor-ceiling, or attic spaces;
      1) Locate markings where they will be visible from access openings, spacings indicated are maximums, provide additional markings when necessary to clearly denote identifications from access openings or when view of markings are obstructed by elements in the concealed space.
   b. Repeated at intervals not exceeding 30-feet measure horizontally along wall or partition.
   c. Include lettering not less than 0.5-inch high with the following wording: "FIRE AND OR SMOKE BARRIER – PROTECT ALL OPENINGS”.
   d. Paint specified in Section 09 9123.

B. The Firestop contractor shall identify penetration firestopping with labels.

1. Attach labels permanently to surfaces adjacent to and within 6-inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping.
2. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels.
3. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
   b. Contractor's Name, address, and phone number.
   c. Through-Penetration firestop system designation of applicable testing and inspecting agency.
   d. Date of Installation.
   e. Through-Penetration firestop system manufacturer’s name.
   f. Installers Name, address and phone number.

C. The firestop contractor is to supply documentation for each single application addressed. This documentation is to identify each penetration and joint location on the entire project.

1. The Documentation Form for Through Penetrations shall include:
   a. A Sequential Location Number
b. The Project Name  
c. Date of Installation  
d. Designation of applicable testing and inspecting agency.  
e. Detailed description of the penetrations location  
f. Manufacturer's name.  
g. Tested System or Engineered Judgment Number  
h. Type of assembly penetrated  
i. A detailed description of the size and type of penetrating item  
j. Size of opening  
k. Number of sides of assemblies addressed  
l. Hourly rating to be achieved  
m. Installers Name, address and phone number

2. The Documentation Form for Construction Joints shall include:
   a. A Sequential Location Number  
   b. The Project Name  
   c. Date of Installation  
   d. Designation of applicable testing and inspecting agency.  
   e. Detailed description of the Construction Joints location  
   f. Manufacturer's name.  
   g. Tested System or Engineered Judgment Number  
   h. Type of Construction Joint  
   i. The Width of the Joint  
   j. The Lineal Footage of the Joint  
   k. Number of sides addressed  
   l. Hourly rating to be achieved  
   m. Installers Name, address and phone number

D. Copies of these documents are to be provided to the general contractor at the completion of the project.

3.7 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, “Standard Practice for On-Site Inspection of Installed Fire Stops” or other recognized standard.

D. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

E. Manufacturer's Field Services: During Installation, provide periodic destructive testing inspections to assure proper installation/application. After installation is complete, submit
findings in writing indicating whether or not the installation of the tested system identified was installed correctly.

F. Inspecting agency will examine completed firestopping to determine, in general, if it is being installed in compliance with requirements.

G. Inspecting agency will report observations promptly and in writing to Contractor and Project Inspector.

H. Do not proceed to enclose firestopping with other construction until reports of examinations are issued.

I. Where deficiencies are found, repair or replace firestopping so that it complies with requirements.

3.8 CLEANING

A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

B. Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to produce firestopping complying with specified requirements.

3.9 PENETRATION FIRESTOPPING SCHEDULE

A. Refer to drawings for specific assemblies.

B. Where UL-classified systems are indicated, they refer to system numbers in UL’s "Fire Resistance Directory" under product Category XHEZ.

C. Where Intertek ETL SEMKO-listed systems are indicated, they refer to design numbers in Intertek ETL SEMKO’s "Directory of Listed Building Products" under “Firestop Systems.”

- END OF SECTION -
PART 1 - GENERAL

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

1.2 SUMMARY
   A. Section Includes:
      1. Sealants and backing for interior and exterior joints.

1.3 RELATED REQUIREMENTS
   A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
   B. Section 01 8113 “Sustainable Design Requirements.”
   C. Pertinent Sections specifying sealants or referencing this Section for sealant products and installation requirements.
   D. Section 07 8413 “Penetration Firestopping” for sealing joints in fire-resistance-rated construction.

1.4 REFERENCES
   C. American Concrete Institute (ACI) Publications and Standards: Standards and manuals listed refer to the latest edition as of the issue date of this Project Manual.
      1. ACI 302.1R - Guide to Concrete Floor and Slab Construction.
      2. ACI 360R-10 - Guide to Design of Slabs-on-Ground.
   D. ASTM International:
2. ASTM C 919 - Standard Practice for Use of Sealants in Acoustical Applications.

E. South Coast Air Quality Management District (SCAQMD):
1. Rule 1168 - Adhesive and Sealant Applications.

F. U.S. Food & Drug Administration (FDA):

1.5 DEFINITIONS

A. Sealant Terminology per ASTM C 834 and ASTM C 920:
1. Type C: Clear / translucent sealant.
2. Type OP: Opaque pigmented sealant.
3. Type S: Single component sealant.
4. Type M: Sealant with two or more components.
5. Grade NS: Nonsag sealant.
7. Grade -18°C: Sealant with low temperature flexibility tested to -18°C (0°F).
8. Grade 0°C: Sealant with low temperature flexibility tested to 0°C (32°F).
9. Grade NF: Sealant does not meet low temperature flexibility requirements.
10. Class12-1/2: Sealant capable of handling movement, either contraction or expansion, of 12.5 percent of the original joint width.
11. Class 25: Sealant capable of handling movement, either contraction or expansion, of 25 percent of the original joint width.
12. Class 35: Sealant capable of handling movement, either contraction or expansion, of 35 percent of the original joint width.
13. Class 50: Sealant capable of handling movement, either contraction or expansion, of 50 percent of the original joint width.
14. Class 100 / 50: Sealant capable of handling movement of 50 percent contraction and 100 percent expansion.
15. Use Related to Exposure:
   a. Use NT: Nontraffic.
   b. Use T: Traffic.
   c. Use I: Immersible.

16. Use Related to Material:
   a. Use A: Sealant used in contact with aluminum.
   b. Use G: Sealant used in contact with glass.
   c. Use M: Sealant used in contact with mortar.
   d. Use O: Sealants used in contact with all other materials other than those previously listed.

1.6 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include color chart from manufacturers for each joint sealant product required.
   2. Provide certification by joint sealant manufacturer that materials provided for this Section are 100 percent asbestos-free.

C. CAL-Green Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

D. Samples for Initial Selection: In form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

E. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

F. Joint-Sealant Schedule: Include the following information.
   1. Joint-sealant application, joint location, and designation.
   2. Joint-sealant manufacturer and product name.
   4. Joint-sealant colors (multiple colors will be required).

G. Qualification Data: For Installer.

H. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
1. Preconstruction Compatibility and Adhesion Test Reports from sealant manufacturer, indicating the following:
   a. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
   b. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
2. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in this Section.

J. Sample Warranty: As specified.

K. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.
   2. Maintenance Data: For sealant, to include in maintenance manuals.
   3. Warranty: Submit executed warranty.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of sealants and backing required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from a single source and from a single manufacturer.

C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

D. Pre-Installation Conference: Conduct at Project site.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing is not required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

B. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
   1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
   2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
   3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
   4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
C. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each kind of sealant and joint substrate indicated.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
   a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.10 FIELD CONDITIONS

A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
   2. When joint substrates are wet.

B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.

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.
1.11 WARRANTY

A. Refer to General Conditions and Section 01 3300 for Contractor’s General Guarantee requirements.

B. Provide a warranty, in writing and signed jointly by the installer and sealant manufacturer, agreeing to replace any and all joints failing within the warranty period at no cost to the Owner, labor and material inclusive.
   1. Warranty: Five (5) years from date of Substantial Completion of the Project.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Building Envelope: Make watertight and weatherproof.
   1. Exterior work that does not remain watertight and all work which does not retain all properties inherent in the product as stipulated by the manufacturer will be considered faulty.

2.2 SYSTEM DESCRIPTION

A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.

B. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.

C. Design Requirements:
   1. Seal building joints with non-sag type sealant.
   2. Seal floor joints with self-leveling or slope grade self-leveling type sealant.

2.3 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
   1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing
according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

E. Colors: Provide color of exposed joint sealants to comply with the following:
   1. Provide colors matching selections made by Architect from manufacturer’s full range of colors for products of type indicated.
   2. Request color selection for all products listed without a preselected color.

2.4 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100 / 50, for Use NT.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Dow Corning Corporation; 790.
      b. Sika Corporation, Construction Products Division; Sikasil® WS-290.
      c. Substitutions: Per Division 01.

B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Dow Corning Corporation; 795.
      b. Sika Corporation, Construction Products Division; Sikasil® WS-295.
      c. Substitutions: Per Division 01.

C. Single-Component, Nonsag, One Part RTV Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, designed for adhering to low energy surfaces common in sheet or peel and stick weather resistant barriers.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Dow Corning Corporation; 758.
      b. Sika Corporation, Construction Products Division; Sikasil®-N Plus.
      c. Substitutions: Per Division 01.

D. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT, A and O.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Dow Corning Corporation; 786 Mildew Resistant.
      b. GE Advanced Materials - Silicones; Sanitary SCS1700.
c. Substitutions: Per Division 01.

2.5 **BUTYL JOINT SEALANTS**

A. Butyl-Rubber-Based Joint Sealants: ASTM C 1311, type recommended by roofing manufacturer to suit application and meet requirements of this Section.
   1. Products: Subject to compliance with requirements, provide one of the following:
      b. Pecora Corporation; BC-158.
      c. Substitutions: Per Division 01.

2.6 **MILDEW-RESISTANT JOINT SEALANTS**

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
   1. Single-component silicone, mildew resistant, acid curing, ASTM C 920, Type S, Grade NS, Class 25, Use NT.
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. Dow Corning Corporation; 786-M White.
      b. GE Construction Sealants; SCS1700 Sanitary.
      c. Substitutions: Per Division 01.

2.7 **ACRYLIC LATEX JOINT SEALANTS**

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, nonsag, paintable, nonstaining. ASTM C 834, Type OP, Grade NF.
   1. Products: Subject to compliance with requirements, provide one of the following:
      b. Sherwin Williams; 950A.
      c. Substitutions: Per Division 01.

2.8 **ACOUSTICAL JOINT SEALANTS**

A. Acoustical Sealant; ASTM C 834, nonsag, paintable, nonstaining latex sealant. Effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Pecora Corporation; AC-20® or AC-20® FTR (Fire & Temperature Rated).
      b. Substitutions: Per Division 01.

2.9 **JOINT SEALANT BACKING**

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
B. Cylindrical Sealant Backer Rods: ASTM C 1330, Type C (closed-cell material with a surface skin), as approved in writing by joint-sealant manufacturer for joint application indicated, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.10 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3. Remove laitance and form release agents from concrete.
4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Spall Repair: Repair spalled joints in concrete slabs to produce joints of profiles recommended by joint sealer manufacturers.

C. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. 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.

D. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

E. Remove sealant and prepare joints in existing exterior locations as directed by representative of sealant manufacturer specified in this work.

3.3 INSTALLATION OF JOINT SEALANTS

A. General:
1. Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
2. Seal around all penetrations, holes, gaps, surface mounted fixtures and pipes entering building including light fixtures, mounting brackets and other similar items.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Joint Sealants at Building Exterior and Interior:
1. Seal the following joints with joint sealant:
   a. Expansion and control joints in exterior walls, copings, parapets.
   b. Joints between metal panels.
   c. Joints between door and window frames and adjacent materials.
   d. Joints around electrical boxes and other penetrations of finish; seal holes within electrical boxes; seal conduit ends.
   e. Joints between cabinets and countertops and walls.
   f. Control joints in interior partitions, including portion above ceilings.
   g. Expansion and control joints in solid exterior soffits.
   h. Control joints in interior ceilings and soffits.
   i. Openings and penetrations which might otherwise permit entrance of water into assemblies.

2. Apply continuous bead of joint sealant in the following locations during installation of materials specified elsewhere:
   a. In lap joints of sheet metal construction.
   b. Roofing panels and roof-related sheet metal and flashing.
   c. Between partition floor and ceiling tracks and adjacent construction.
d. Between end stud of partition and adjacent construction.

e. Under door sills and thresholds.

1) Set all sills and thresholds in continuous double bead of sealant. Provide sealant at butt ends of thresholds against door frame, around door frame and between threshold and resilient floor covering.

3. Apply acoustic sealant at acoustic separations to make assembly airtight.

a. Seal perimeter and intersections of finish.

b. Seal around electrical boxes and other penetrations of finish; seal holes within electrical boxes; seal conduit ends.

c. Seal pipes which penetrate acoustic separations.

4. Apply joint sealant at joints not specifically mentioned above which require sealant to meet the performance criteria cited in this Section.

D. Installation of Sealant Backer Rods: Install sealant backer rods to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

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 that have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.

E. Sealant Installation: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

F. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, 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 that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

1. Provide concave joint configuration per Figure 8A in ASTM C 1193, unless otherwise indicated.

2. Provide flush joint configuration, per Figure 8B in ASTM C 1193, where indicated.

3. Provide recessed joint configuration, per Figure 8C in ASTM C 1193, of recess depth and at locations indicated.

a. Use masking tape to protect adjacent surfaces of recessed tooled joints.

G. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer’s written recommendations.
3.4 DEFECTIVE WORK
A. Repair damaged and defective work and eliminate functional and visual defects. Where repair is not possible replace work. Adjust joints for uniform appearance.
B. Cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

3.5 CLEANING AND PROTECTION
A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
B. Clean excess adhesive from exposed surfaces of neoprene compression seal with solvent cleaner as recommended by manufacturer.
C. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

3.6 SEALANT SCHEDULE
A. Color Selections: Architect will provide color selections and locations for each sealant type and for Contractor's use. Not all locations will have the same color. Custom colors will be required.
B. General:
   1. Joints in construction between interior and exterior spaces and other designated or required locations to provide effective barrier against passage of elements:
      a. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
   2. Specialty perimeters where required for appearance or weather tightness:
      a. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100 / 50, for Use NT.
C. Exterior Locations:
   1. Joints Bordered by Glass: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
   2. Joints Bordered by Plastic: Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 100 / 50, for Use NT.
      a. Where walks abut structural slabs or stoops.
      b. Where walks abut exterior wall of buildings.
      c. Where exposed interior concrete slabs abut vertical surfaces.
      d. Where sealant is shown on the Drawings for concrete slabs.
   4. Membrane Roofing Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.
5. Steep Slope Roofing Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.

6. Sheet Metal and Roof Accessory Sealants: Types recommended by roofing manufacturer and complying with requirements of this Section.

7. Exterior Sheet Metal Lap Joints: Types recommended by manufacturer and complying with requirements of this Section.

8. Exterior Metal Panel Butt Joints and Trim: Types recommended by manufacturer and complying with requirements of this Section.

9. All Other Exterior Joints:
   a. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 100 / 50, for Use NT.
   b. Single-component, nonsag, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
   c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
   d. Expansion and control joints in masonry.
   e. Masonry at dissimilar material or at dissimilar masonry.
   f. Sills and thresholds.
   g. At miscellaneous locations where sealant is shown on Drawings.

D. Interior Locations:

1. Expansion and Control Joints:
   a. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT, M, A and O.
   b. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 35, for Use NT.
   c. Around perimeters of frames where door, window and louver frames abut concrete, masonry or other building materials.
   d. Masonry at dissimilar material or at dissimilar masonry.
   e. Sills and thresholds.
   f. At miscellaneous locations where sealant is shown on Drawings.

2. Interior Concrete Slabs on Grade: Urethane, self-leveling; ASTM C 920, Grade P, Class 25, Uses T, M and A; single component.

3. Interior Wet Areas, Around Plumbing Fixtures, Countertops Abutting Walls, Food Service Applications: Mildew-resistant, single-component, acid-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 25, for Use NT, A and O.

4. Interior Static Dry Joints as Required to Dress Appearance: Acrylic latex or siliconized acrylic latex joint sealant, ASTM C 834, Type OP, Grade NF

5. Sound Control Applications: Acoustical Sealant, ASTM C 834

- END OF SECTION -
# DIVISION 08 – OPENINGS

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HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Steel door frames.

B. Gasketing and hardware for fire-rated assemblies are specified in Section 08 7110 “Finish Hardware.”

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 08 7100 “Door Hardware” for coordination of hardware installation.

D. Section 09 2900 “Gypsum Board” for coordination of installation.

E. Division 26 Sections for electrical connections including conduit and wiring for door controls and operators.

1.4 DEFINITIONS

A. Steel Sheet Thicknesses: Thickness dimensions, including those referenced in ANSI A250.8, are minimums as defined in referenced ASTM standards for both uncoated steel sheet and the uncoated base metal of metallic-coated steel sheets.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.5 REFERENCES


C. ANSI A250.8-1998/SDI-100 - Recommended Specifications - Standard Steel Doors and Frames, Steel Door Institute, unless herein specified.

D. Underwriters' Laboratories Inc. (UL) UL 10C-98 – Fire Tests of Door Assemblies.


J. ASTM A 569 – Specification for Steel, Carbon, (0.15 maximum percent), Hot-Rolled Sheet and Strip Commercial Quality.

K. ASTM-A 924 – General Requirements for Steel Sheet, Metallic Coated by the Hot-Dip Process.

L. SDI-105-92 – Recommended Erection Instructions for Steel Frames.

M. ANSI A115.1.18 - Specification for Door and Frame Preparation for Hardware.

N. ANSI A156.7 - Standard Template Hinge Dimensions.

1.6 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include door designation, type, level and model, material description, core description, construction details, label compliance, sound and fire-resistance ratings, and finishes.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low / No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

D. Door Schedule: Use same reference designations indicated on Drawings in preparing schedule for doors and frames.

E. Shop Drawings: Include the following:
   1. Elevations of each frame design.
   2. Details of frames, including vertical and horizontal edge details and metal thicknesses.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.7 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.
B. Steel Door and Frame Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.
C. Applicable Standards: Specifications and standards of SDI 100-98.
E. Supplier Qualification: Qualified direct distributor of products to be furnished. The distributor shall have in their regular employment an A.H.C. /C.D.C. or person of equivalent experience who will be available at reasonable times to consult with the Architect, Contractor and/or Owner regarding any matters affecting the total door and frame openings.
F. Installer Qualification: Experience with installation of similar materials.
G. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 “Standard for Fire Doors and Windows”, and have been tested, listed, and labeled in accordance with ASTM E152 "Standard Methods of Fire Tests of Door Assemblies" by nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.
   1. Oversize Fire-Rated Door Assemblies: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, provide certificate or label from approved independent testing and inspection agency, indicating that door and frame assembly conforms to requirements of design, materials and construction as established by individual listings for tested assemblies.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of Section 01 6000.
B. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
   1. Provide additional protection to prevent damage to finish of factory-finished units.
C. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
D. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.
   1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.
1.9 PROJECT CONDITIONS
A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.10 COORDINATION
A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 ACCEPTABLE MANUFACTURERS
A. Providing the products supplied comply with specifications.
5. Substitutions: Section 01 2500.

2.3 FRAMES
A. General: Provide steel frames for doors, transoms, sidelights, borrowed lights, and other openings that comply with ANSI A250.8 and with details indicated for type and profile. Conceal fastenings, unless otherwise indicated.

B. Frames of 0.067-inch- (14 ga.) thick steel sheet for:
1. Wood doors, unless otherwise indicated.

C. Typical Reinforcing: Provide minimum hinge reinforcement 3/16 inch by 1-1/2 inch by 10 inch. Provide similar reinforcement for hardware items as required to adequately withstand stresses, minimum 12 gauge, including channel reinforcement for door closers and closer arms, door holders and similar items. Provide reinforcement and clearances for concealed in-head door closers and for mortise locks.

D. Cover Plates: For hinge and strike plate cutouts, provide fully enclosed pressed steel cover boxes spot welded to frames behind mortises.

E. Hardware: Mortise, reinforce, drill and tap for mortise hardware, except drilling and tapping for surface door closers, door closer brackets and adjusters shall be done in field.

F. Anchorage: Provide standard and special anchorage items as required. Provide formed steel channel spreader at bottom of frames, removable without damaging frame. At masonry, provide anchors (about 2 inch by 10 inch) approximately 24 inches on center.
G. Door Silencers: Except on weather-stripped frames, fabricate stops to receive three silencers on strike jambs of single-door frames and two silencers on heads of double-door frames.

H. Plaster Guards: Provide 0.020-inch-(24 ga.) thick, steel sheet plaster guards or mortar boxes to close off interior of openings; place at back of hardware cutouts where mortar or other materials might obstruct hardware operation.

I. Supports and Anchors: Fabricated from not less than 0.042-inch-(18 ga.) thick, electrolytic zinc-coated or metallic-coated steel sheet.
   1. Wall Anchors in Masonry Construction: 0.177-inch-diameter, steel wire complying with ASTM A 510 may be used in place of steel sheet.

J. Inserts, Bolts, and Fasteners: Manufacturer’s standard units. Where zinc-coated items are to be built into exterior walls, comply with ASTM A 153, Class C or D as applicable.

K. Labeled Frames: Construct in accordance with requirements for labeled work. Attach proper U.L. label, Warnock Hersey. “B” labeled frames shall be 1-1/2 hour construction.

L. Joinings: At frames with equal width jambs and head, neatly miter on face (except locations as at transom bars and at frames with large head members). Cope and butt stops. Weld length of entire joint, including face and flat intersections. Grind smooth, at other frames, provide same mitered joint wherever possible (at intersection of jamb-head or jamb-sill) and at other locations butt metal neatly and full weld. If tight butt joints are utilized, joints shall be neatly caulked smooth.

M. Workmanship: Fabricate so no grind marks, hollow or other out-of-plane areas are visible. At joints of intermediate members (such as mullions and transom bars), provide tight joining, neatly accomplished without holes, burned out spots, weld build up or other defacing work. Fill to close cracks and to preserve shapes. Tightly fit loose stops, to hairline joints.

N. Finish: Clean frames by degreasing process and apply thorough coating of baked-on primer, covering inside as well as outside surfaces. At galvanized frames, coat welds and other disrupted surface with zinc-rich paint containing not less than 90 percent zinc dust by weight.

2.4 FRAME ANCHORS

A. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
   1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

B. Jamb Anchors:
   1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
   2. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
   3. Post-Installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-(9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

C. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:
   1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2.5 ACCESSORIES
A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
B. Ceiling Struts: Minimum 1/4-inch-thick by 1-inch- (6.4-mm-thick by 25.4-mm-) wide steel.

2.6 MATERIALS
A. Hot-Rolled Steel Sheets: ASTM A 569, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
B. Cold-Rolled Steel Sheets: ASTM A 366, Commercial Steel (CS), or ASTM A 620, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.
C. Metallic-Coated Steel Sheets: ASTM A 653, Commercial Steel (CS), Type B, with an A40 (galvannealed) coating; stretcher-leveled standard of flatness.
1. For exterior installations.
D. Electrolytic Zinc-Coated Steel Sheet: ASTM A 591, Commercial Steel (CS), Class B coating; mill phosphatized; suitable for unexposed applications; stretcher-leveled standard of flatness where used for face sheets.
E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
F. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.
G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. (96- to 192-kg/cu. m) density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
I. Glazing: Comply with requirements in Division 08 Section "Glazing."
J. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.7 FABRICATION
A. General: Fabricate steel door and frame units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, 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.
B. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
1. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
C. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

D. Core Construction: Manufacturer’s standard core construction that produces a door complying with SDI standards.

E. Single-Acting, Door-Edge Profile: Square edge, unless beveled edge is indicated.

F. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

G. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.

H. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

I. Hardware Preparation: Prepare frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware.

J. Frame Construction: Fabricate frames to shape shown.
   1. Fabricate frames with mitered and continuously welded corners and seamless face joints (knock-down frames not acceptable).
   2. Fabricate all exterior door frames with integral metal drip.

K. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.

2.8 FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer’s standard primer.
   1. Shop Primer: Manufacturer’s standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
   1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
   2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
   3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
   4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.

C. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install steel frames, and accessories according to ANSI A250.8, manufacturer’s data, and as specified.

B. Placing Frames: Comply with provisions in SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
   1. Place frames before construction of enclosing walls and ceilings.
   2. Install fire-rated frames according to NFPA 80.
   3. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
      a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
      b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
      c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
      d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
   4. Concrete Walls: Solidly fill space within door frames, and between frames and concrete walls, with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
   5. In metal-stud partitions, provide at least three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Attach wall anchors to studs with screws.

C. Door Installation: Comply with ANSI A250.8. Fit doors accurately in frames, within clearances specified in ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.
   1. Fire-Rated Doors: Install within clearances specified in NFPA 80.
3.4 ADJUSTING AND CLEANING

A. Prime-Coat Touchup: Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of compatible air-drying primer.

B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

C. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

D. Remove grout and other bonding material from hollow metal work immediately after installation.

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Solid-core flush wood doors.
   2. Lite frames and louvers for wood doors.
   3. Factory finishing for wood doors.
   4. Factory machining for hardware.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 08 1113 “Hollow Metal Doors and Frames” for installation in metal frames as scheduled.

D. Section 08 7100 “Door Hardware” for coordination of hardware installation.

E. Section 08 8000 “Glazing” for vision panel and full lite glass.

1.4 REFERENCES


C. National Fire Protection Association (NFPA):
   1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
   2. NFPA 252 – Standard Methods of Fire Tests of Door Assemblies

E. Underwriters' Laboratories Inc. (UL):
   1. UL 10B - Standard for Fire Tests of Door Assemblies.
   2. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies.

F. Window and Door Manufacturers Association (WDMA):

1.5 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include details of core and edge construction, trim for openings, and factory-finishing specifications.

B. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low / No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.
   3. Composite Wood Formaldehyde Limits: Provide certification that all products meet current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates as specified in Section 01 6116.

C. 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 veneer matching and factory finishing and other pertinent data.
   1. For factory-machined doors, indicate dimensions and locations of cutouts for locksets and other cutouts adjacent to light openings.

D. Samples for verification in the form and size indicated below:
   1. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.
   2. Factory samples of each species of veneer and each finish.
   3. Frames for light openings, 6 inches long, for each material, type, and finish required.
   4. Louver blade and frame sections, 6 inches long, for each material and finish specified.

E. Sample Warranty: As specified.

F. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.
   2. Maintenance Data: For wood doors, to include in maintenance manual.
3. Warranty: Submit executed warranty.

1.6 QUALITY ASSURANCE

A. Fire-Rated Wood Doors: Provide wood doors which are identical in materials and construction to units tested in door and frame assemblies in accordance NFPA 252 and which are labeled and listed for ratings indicated by ITS – Warnock Hersey, UL or other testing and inspection agency acceptable to authorities having jurisdiction.
   1. Doors: Comply with UL 10B where required.
   2. Provide intumescent requirements in compliance with UL 10C.

B. Quality Inspection: Provide one additional door of each type for inspection purposes. The architect will choose one door, of each type, at random, to “Tear Down” and inspect for door construction compliance with the project specification (veneer thickness, core material, stile and rail size, material, blocking, etc.). These doors are to be included in the wood door supplier’s base price on the date that the project bids.

C. Single-Source Responsibility: Obtain doors from one source and by a single manufacturer.

D. Pre-Installation Conference: Conduct at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer’s instructions.

B. Handle doors in accordance with recommendations of WDMA I.S.1A, “Care and Installation at Job Site.”

C. Identify each door with individual opening numbers as designated on Shop Drawings, using temporary, removable, or concealed markings.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.9 WARRANTY

A. Refer to General Conditions for Contractor’s General Guarantee requirements.

B. Door Manufacturer’s Warranty: Submit written agreement on door manufacturer’s standard form signed by manufacturer, Installer, and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch in a 42 inch x 84 inch section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3 inch span, or do not conform to tolerance limitations of referenced quality standards.
   1. Warranty to also include installation and finishing that may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
2. Warranty to be in effect during the following period of time after date of Substantial Completion.

C. Contractor's Responsibilities: Replace doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following manufacturers:
   1. Graham Manufacturing.
   2. Eggers Industries.
   3. Algoma Hardwoods.
   4. VT Industries.
   5. Marshfield Doors.
   6. Substitutions: Section 01 2500.

2.3 DOOR CONSTRUCTION, GENERAL

A. WDMA I.S.1A Door Construction Grade: Premium A.

B. WDMA I.S.1A Performance Grade: Extra Heavy Duty.

2.4 FLUSH WOOD DOOR MATERIALS

A. Non-Fire Rated Doors: 1-3/4 inch thickness, interior flush wood, bonded, solid core conforming to WDMA I.S.1A and the following:
   1. Core: Bonded structural composite lumber (SCL-5 Timberstrand LSL).
   2. Stiles: Hardwood over structural composite lumber (SCL), glued to core.
   3. Rails: Mill option hardwood or SCL, 2 inch top and bottom.
   4. Facing:
      a. Doors with Opaque Finish: MDO or any closed-grain hardwood of mill option.
   5. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering. Faces are bonded to core using a hot press.

B. Fire Rated Doors: 1-3/4 inch thickness, interior flush wood, bonded, solid core conforming to WDMA I.S.1A and the following:
   1. Core: Bonded mineral core (FD) containing no asbestos.
2. Stiles: Hardwood over mineral composite, glued to core.
3. Rails: Mineral composite as required by fire door authorities.
4. Facing:
   a. Doors with Opaque Finish: MDO or any closed-grain hardwood of mill option.
   a. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering. Faces are bonded to core using a hot press.
6. Where UL 10B requirements for positive pressure must be met, doors to include all requirements as part of the door construction per “Category A” guidelines as published by ITS / Warnock-Hersey. No intumescent is allowed on the frame. Only smoke gasketing applied around the perimeter of the frame to meet the “S” smoke rating is permissible in instances where smoke control is required.

C. Adhesives:
   1. Do not use adhesives containing urea formaldehyde.
   2. Face to core adhesives to be Type I or Type II as appropriate for location in building. Adhesives to be classified Type I or Type II per WDMA TM-6 “Adhesive Bond Test Method.”
      a. Type I adhesives to be used for doors in exterior applications.
      b. Type II adhesives to be used for doors in interior applications.

D. Factory Finishing:
   1. Comply with referenced WDMA Section F-1, “Factory Finishing.”
   2. Pre-finish wood doors at factory unless otherwise noted.
      a. Opaque Finish Colors: Match Architect’s sample.

E. STC Requirements: See Door Schedule sheet in Drawings.

2.5 LIGHT FRAMES AND LOUVERS

A. Metal Frames for Light Openings in Non-Rated and Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch-thick, cold-rolled steel sheet; with baked-enamel or powder-coated finish; and approved for use in doors of fire-protection rating indicated.
   1. Color: As selected by Architect from manufacturer’s full range of options.

B. Metal Louvers:
   1. Subject to compliance with requirements, provide products by one of the following manufacturers:
      d. Substitutions: Section 01 2500.

C. Blade Type: Vision-proof, inverted V.

D. Metal and Finish: Hot-dip galvanized steel, 0.040 inch thick, with baked-enamel or powder-coated finish.
1. Color: As selected by Architect from manufacturer’s full range of options.

2.6 FABRICATION, FLUSH WOOD DOORS

A. Fabricate wood doors in accordance with requirements of WDMA I.S.1A Quality Standards.

B. Fabricate fire rated doors in accordance with requirements of ITS – Warnock Hersey or Underwriters’ Laboratories, with metal label on each door including UL 10C.

C. Fabricate doors with WDMA Quality Standards hardware blocking options as follows:
   1. Provide HB-1 – head and HB-2 – sill rails and HB-4 – lock block on all doors.
   2. Provide HB-6 only when exit devices are specified for door.
   3. Provide HB-8 for pivots or when floor bolts are specified under Section 08 7100 “Door Hardware”.

D. Provide doors with minimum 1/4 inch thick edge strips, of wood species to match face veneers except as required for fire rating.

E. Make cut-outs and provide metal frames for glass and louvers. Install metal door louvers. Seal cut-outs prior to installation of moldings.

F. Bevel lock and hinge edges of single acting doors 3 degrees or 1/8 inch in 2 inches. Radius strike edge of double acting swing doors as required by pivot hinge manufacturer.

G. Prepare doors to receive hardware. Refer to Section 08 7100 “Door Hardware” and NFPA 80 for hardware requirements including UL 10C.
   1. Prefit and bevel to net opening size less approximately 1/4 inch in width on single swing doors 3/16 inch in width for paired doors. Provide 1/4 inch clearance above finished floor, unless otherwise indicated on drawings. Provide 1/8 inch clearance at top of door.
   2. Slightly ease vertical edges.

2.7 FINISHING

A. Finish wood doors at factory that are indicated to receive opaque finish.
   1. Finish faces and all four edges of doors, including mortises and cutouts.

B. Opaque Finish:
   1. NAAWS Grade: Custom.
   3. Color and Sheen: As selected by Architect from manufacturer’s full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions with Installer present for compliance with requirements, installation tolerances, and other conditions affecting performance of the work.
B. Examine doors and installed door frames before hanging doors.
   1. Reject doors with defects.

C. Verify preparatory work by other trades is complete.
   1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of conditions.

3.2 INSTALLATION

A. Condition doors to average temperature and humidity in area of installation for not less than 48 hours prior to installation. Store doors per recommendations of WDMA I.S.1A, “Care and Installation at Job Site.”
   1. Install work after building humidity is at acceptable level.

B. Install doors in neat and workmanlike manner, free from hammer or tool marks, open joints or slivers.

C. Set doors plumb, level, square and true.

D. Pilot drill screw and bolt holes.

E. Field Trimming of Doors:
   1. Trim door width by cutting equally on both jamb edges, to a maximum of 3/16 inch.
   2. Trim door height by cutting equally on top and bottom edges to a maximum of 3/4 inch.

F. Coordinate installation of vision panel glass and full lites.

G. Install door louvers where scheduled.

H. Remove and replace all doors found to be warped, twisted, bowed, or otherwise damaged. Do not install doors which cannot be properly fitted to frames.

I. Adjust prefinished doors and hardware and other moving or operating parts to function smoothly and correctly.
   1. Fire-Rated Doors: Ensure that smoke gaskets are in-place before prefinished door installation.

J. Install fire-rated doors in accordance with NFPA 80.

3.3 ADJUSTING AND PROTECTION

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Refinish or replace doors damaged during installation.

C. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at date of Substantial Completion.
- END OF SECTION -
- SECTION 08 3113 -

ACCESS DOORS AND PANELS

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section Includes:
1. Access doors and panels for walls, floors and ceilings.
   a. Non-rated and fire-rated.

1.3 RELATED REQUIREMENTS
A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 "Sustainable Design Requirements."
C. Section 07 7200 "Roof Accessories" for roof hatches.
D. Section 08 7100 "Door Hardware" for mortise or rim cylinder locks and master keying.
E. Division 23 Section specifying air duct-mounted access doors.

1.4 REFERENCES
C. ASTM International:
7. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
10. ASTM A 793 - Standard Specification for Rolled Floor Plate, Stainless Steel.

D. National Association of Architectural Metal Manufacturer:

   1. Solvent Cleaning (SSPC-SP 1).
   2. White Metal Blast Cleaning (SSPC-SP 5/NACE No. 1).
   3. Pickling (SSPC-SP 8).
   4. Zinc-Rich Coating Inorganic and Organic (SSPC-PT-20)

F. Underwriters Laboratories, Inc. (UL):
   1. UL Fire-Resistance Directory.

1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low / No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand,
application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

D. Shop Drawings: Show fabrication, placement and installation details including access panels for each type of substrate.
   1. Include access door and panel sizes.
   2. Include plans, elevations, sections, details, and attachments to other work.
   3. Shop Drawings to be reviewed and approved by Architect prior to installation.

E. Access Door and Frame Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

F. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of access door(s) and frame(s) through one source from a single manufacturer.

B. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics per the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
   1. ASTM E 119 or UL 263 for horizontal access doors and frames.

C. Pre-Installation Conference: Conduct at Project site.

1.7 COORDINATION

A. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed plumbing, mechanical, or other concealed work, and indicate in the schedule specified in "Submittals" Article.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 STEEL MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36.
   1. ASTM A123, for galvanizing steel and iron products.
   2. ASTM A 153, for galvanizing steel and iron hardware.
B. Rolled-Steel Floor Plate: ASTM A 786, rolled from plate complying with ASTM A 36 or ASTM A 283, Grade C or D.
   1. ASTM A 123 for galvanizing steel and iron products.
   2. ASTM A 153 for galvanizing steel and iron hardware.

C. Steel Sheet: Uncoated or electrolytic zinc-coated, ASTM A 879 with cold-rolled steel sheet substrate complying with ASTM A 1008, Commercial Steel (CS), exposed.

D. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS) with A60 zinc-iron-alloy (galvannealed) coating or G60 mill-phosphatized zinc coating; stretcher-leveled standard of flatness; with minimum thickness indicated representing specified thickness according to ASTM A 924.

E. Steel Finishes: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Surface Preparation for Steel Sheet: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
   2. Surface Preparation for Metallic-Coated Steel Sheet: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
   3. Factory-Primed Finish: Apply shop primer immediately after cleaning and pretreating.

F. Drywall Beads: Edge trim formed from 0.0299-inch (0.76mm) zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum board.

G. Plaster Beads: Casing bead formed from 0.0299-inch (0.76-mm) zinc-coated steel sheet with flange formed out of expanded metal lath and in size to suit thickness of plaster.

2.3 STAINLESS STEEL MATERIALS

A. Rolled-Stainless-Steel Floor Plate: ASTM A 793, manufacturer's standard finish.

B. Stainless Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304. Remove tool and die marks and stretch lines or blend into finish.
   1. Finish: Brushed No. 4 finish.

2.4 ALUMINUM MATERIALS

A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.
   1. Mill finish, AA-M10 (Mechanical Finish: As fabricated, unspecified).

   1. Mill finish, AA-M10 (Mechanical Finish: As fabricated, unspecified).
C. Aluminum Sheet: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than strength and durability properties of Alloy 5005-H15; with minimum sheet thickness indicated representing specified thickness according to ANSI H35.2.

2.5 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Babcock-Davis.
   2. Dur-Red Products.
   3. J. L. Industries, Inc.
   5. Larsen's Manufacturing Company.
   6. Milcor Inc.
   7. Nystrom, Inc.

B. Sizes: As required and as indicated on approved Shop Drawings.

   1. Locations: Wall surfaces (Wet Areas).
   2. Door: Minimum 0.060 inch (1.5 mm) thick sheet metal, set flush with exposed face flange of frame.
   3. Frame: Minimum 0.060 inch (1.5mm) thick sheet metal with 1 inch (25 mm) wide, surface-mounted trim.
   5. Latch: Self-latching bolt operated by ring turn with interior release.

   1. Locations: Wall surfaces.
   2. Door: Minimum 0.060 inch (1.5 mm) thick sheet metal, set flush with surrounding finish surfaces.
   3. Frame: Minimum 0.060 inch (1.5 mm) thick sheet metal with drywall bead flange.
   5. Latch: Self-latching bolt operated by screwdriver with interior release.

   1. Locations: Wall and ceiling surfaces.
   2. Door: Minimum 0.040 inch (1.0 mm) thick, metallic-coated steel sheet; flush panel construction with manufacturer's standard 2 inch (50 mm) thick fiberglass insulation.
   3. Frame: Minimum 0.060 inch (1.5 mm) thick extruded aluminum.
5. **Lock**: Dual-action handles with key lock.

   1. **Locations**: Rated wall and ceiling surfaces.
   2. **Fire-Resistance Rating**: Not less than that of adjacent construction.
   3. **Temperature Rise Rating**: 250 degrees F (139 degrees C) at the end of 30 minutes.
   4. **Door**: Flush panel with a core of mineral-fiber insulation enclosed in sheet metal with a minimum thickness of 0.036 inch (0.9 mm).
   5. **Frame**: Minimum 0.060 inch (1.5 mm) thick sheet metal with drywall bead.
   6. **Hinges**: Concealed-pin type Continuous piano.
   7. **Automatic Closer**: Spring type.
   8. **Lock**: Self-latching device with cylinder lock.

**G. Hardware**:
   1. Compression spring tubes shall be an anti-corrosive composite, all fasteners shall be Type 316 stainless steel material, and all other hardware shall be zinc plated and chromate sealed.
   2. Lifting mechanisms: Provide number and size of compression spring operators enclosed in telescopic tubes required to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe fastened to a formed 1/4 inch gusset support plate.
   3. **Hinges**: Continuous heavy duty Type 316 stainless steel hinge accessible only when the cover is in the open position.
   4. **Cover**: Provide aluminum hold open arm that automatically locks the cover in the open position.
   5. **Latching**:
      a. **Underside**: Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
      b. **Upper side**: Removable exterior turn/lift handle with a spring loaded ball detent. Protect the latch release with flush, gasketed, removable screw plug.

**H. Finishes**: Factory finish shall be mill finish aluminum with bituminous coating applied to the exterior of the frame.

2.6 **FABRICATION**

**A. General**: Provide access door and frame assemblies manufactured as integral units ready for installation.

**B. Metal Surfaces**: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

**C. Doors and Frames**: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
1. Exposed Flanges: Nominal 1 to 1-1/2 inches (25 to 38 mm) wide around perimeter of frame.
2. For trimless frames with drywall bead, provide edge trim for gypsum board and gypsum base securely attached to perimeter of frames.
3. For trimless frames with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.
4. Provide mounting holes in frames for attachment of units to metal or wood framing.

D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
1. For cylinder lock, furnish two keys per lock and key all locks alike.

E. Extruded Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that will come in contact with concrete.

2.7 FINISHES
A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
C. Steel and Metallic-Coated-Steel Finishes:
1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.
D. Stainless-Steel Finishes:
1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
   a. Run grain of directional finishes with long dimension of each piece.
   b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
   c. Directional Satin Finish: No. 4.
E. Aluminum Finishes:
1. Mill finish.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates, areas, and conditions with Installer present for compliance with requirements, installation tolerances, and other conditions affecting performance of the work.
B. Verify preparatory work by other trades is complete.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.

3.3 ADJUSTING

A. Adjust doors and hardware after installation for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

3.4 CLEANING AND PROTECTION

A. Clean access door exposed surfaces according to manufacturer's recommendations.

B. Protect access doors from damage until date of Substantial Completion.

- END OF SECTION -
SECTION 087100 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:
   1. Swinging doors.
   2. Sliding doors.
   3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:
   1. Mechanical door hardware.
   2. Cylinders specified for doors in other sections.

C. Related Sections:
   1. Division 08 Section “Hollow Metal Doors and Frames”.
   2. Division 08 Section “Flush Wood Doors”.
   3. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   6. NFPA 105 - Installation of Smoke Door Assemblies.
   7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:
   1. ANSI/BHMA Certified Product Standards - A156 Series
   2. UL10C – Positive Pressure Fire Tests of Door Assemblies
1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:
   a. Type, style, function, size, label, hand, and finish of each door hardware item.
   b. Manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
   e. Explanation of abbreviations, symbols, and codes contained in schedule.
   f. Mounting locations for door hardware.
   g. Door and frame sizes and materials.
   h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.

2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.

3. Review sequence of operation narratives for each unique access controlled opening.

4. Review and finalize construction schedule and verify availability of materials.

5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:
1. Seven years for heavy duty cylindrical (bored) locks and latches.
2. Twenty five years for manual surface door closer bodies.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.
2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:
   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:
   a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:
   a. Hager Companies (HA) - CB Series.
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.
   c. Stanley Hardware (ST) - CB Series.

2.3 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

C. Cylinders: Original manufacturer cylinders complying with the following:
1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.

D. Keying System: Each type of lock and cylinders to be factory keyed.
   1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
   2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
   3. Existing System: Field verify and key locks to match Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:
   1. Change Keys per Cylinder: Two (2)
   2. Master Keys (per Master Key Level/Group): Five (5).

F. Construction Keying: Provide construction master keyed cylinders.

2.4 MECHANICAL LOCKS AND LATCHING DEVICES
A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.
   1. Furnish with solid cast levers, standard 2 3/4” backset, and 1/2” (3/4” at rated paired openings) throw brass or stainless steel latchbolt.
   2. Locks are to be non-handed and fully field reversible.
   3. Manufacturers:
      a. Corbin Russwin Hardware (RU) – CL3300 Series.
      b. Sargent Manufacturing (SA) – 10 Line.
      c. Schlage (SC) – ND Series.

2.5 AUXILIARY LOCKS
A. Sliding Door Privacy Lock: Provide field reversible units with emergency release key and ADA options as specified.
   1. Manufacturers:
      a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
2.6 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.7 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
   b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.


10. Rail Sizing: Provide exit device rails factory sized for proper door width application.

11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices, Aluminum Entrances: ANSI/BHMA A156.3, Grade 1 certified panic devices furnished in the functions specified in the Hardware Sets. Push bar to be made of extruded aluminum, maximum projection of 3”, available in clad or anodized architectural finishes. Exit device design to fit narrow (minimum 2”), medium, or wide stile aluminum door applications.

1. Manufacturers:
   a. Adams Rite Manufacturing (AD) - 8000 Series.

2.8 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use.
Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

1. Manufacturers:
   a. Corbin Russwin Hardware (RU) - DC6000 Series.
   b. Norton Door Controls (NO) - 8500 Series.
   c. Sargent Manufacturing (SA) - 1431 Series.
   d. Yale Locks and Hardware (YA) - 3500 Series.

2.9 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:
   a. Hiawatha, Inc. (HI).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Trimco (TC).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
1. Manufacturers:
   a. Rixson Door Controls (RF).
   b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
   c. Sargent Manufacturing (SA).

2.10 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.11 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.
2.12 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.


3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."

4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch-Out Report): Reference Division 01 Section "Closeout Procedures". Final inspect installed door hardware and state in report whether work complies with or deviates from specification requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.
3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

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

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

### Hardware Sets

**Set: 1.0**

Doors: E100

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<th>Item</th>
<th>Model</th>
<th>Quantity</th>
<th>Notes</th>
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<td>335</td>
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<td>1 Cylinder</td>
<td>Match Facility Standard</td>
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<tr>
<td>1 Balance of Hardware</td>
<td>Existing to Remain</td>
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**Set: 2.0**

Doors: E106

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<td>628</td>
<td>AD</td>
</tr>
<tr>
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<tr>
<td>1 Electric Strike</td>
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<td>1 Power Supply</td>
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<tr>
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**Set: 3.0**

Doors: 115

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<tr>
<td>------------------------</td>
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<td>3 Hinge</td>
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<td>9-X36 630 RF</td>
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<td>1 Surface Closer</td>
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<td>1 Kickplate</td>
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<td>K1050 10&quot; High x CSK US32D RO</td>
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<tr>
<td>1 Wall Stop</td>
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<tr>
<td>3 Silencer</td>
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<td>1 Existing Hardware</td>
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END OF SECTION 087100

DOOR HARDWARE
## DIVISION 09 – FINISHES

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- SECTION 09 0511 -

CONCRETE FLOOR PREPARATION

PART 1 - GENERAL

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

1.2 SUMMARY
   A. Section Includes:
     1. Mechanical preparation and cleaning of new concrete floor surfaces for application of the
        following finishes:
        a. Moisture Mitigation Control Coating.
        b. Other Coatings.
        c. Finish Flooring.

1.3 RELATED REQUIREMENTS
   A. Section 01 6116 “Volatile Organic Compound (VOC) Restrictions”.
   B. Section 01 8113 “Sustainable Design Requirements”.
   C. Section 03 3000 "Cast-In-Place Concrete" for concrete floor slabs.
   D. Section 07 2633 “Moisture Mitigation Control Coating”.
   E. Division 09 Sections for applied floor finishes.

1.4 REFERENCES
   A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code,
      “CAL-Green”.
   B. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International
      Building Code, with California Amendments.
1.5 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
   1. Review conditions affecting substrate preparation.
   2. Review procedures that will be used for substrate preparation.
   3. Require attendance by Moisture Mitigation System and Finish Flooring installers to review preparation requirements of floor finish product and flooring adhesive manufacturers.

1.6 SUBMITTALS

A. Product Data: For each type of mechanical cleaning equipment used on the project.

B. CAL-GREEN Submittals:
   1. Dust Control Plan: Written description of materials and procedures used to control and remove dust from working area, prevent contamination of HVAC systems.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer performing surface preparation.

B. Field quality-control reports.
   1. Submit report of observations.
   2. Certify installation is complete in accordance with manufacturer’s instructions.
   3. Indicate supplementary instructions provided for Project specific conditions.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained in the use of the equipment and techniques required to produce the specified results.

B. Mockups: Provide field mockups to set quality standards for surface preparation execution and for preconstruction testing.
   1. Provide mockup of typical surface preparation, minimum 100 sq. ft. area. Coordinate required size with requirements for preconstruction testing.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work when undisturbed at time of Substantial Completion.
PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify new concrete floors have cured minimum 28 days.

B. Examine substrates, with Installer present, for compliance with requirements for surface contamination, damage, and other conditions affecting performance of the Work.

C. Examine substrate to determine repairs required to restore substrate surface to be within tolerances required for floor finishes specified in other sections, prior to completing Work of this section.

D. Examine substrate to verify surfaces prepared in accordance with this section will be suitable for application of finishes specified in other sections.

E. Prepare written report, endorsed by Installer, listing conditions detrimental to performance with recommendations for methods and materials required to correct conditions before proceeding with work of this section.

F. Proceed with surface preparation only after unsatisfactory conditions have been corrected.
   1. Proceeding with surface preparations indicates acceptance and conditions of substrate.

3.2 SURFACE PREPARATION EQUIPMENT

A. Mechanical Cleaning Equipment: Automatic, dry abrasive blast type, with vacuum recovery systems to control dust and collect surface abrasions.

B. Mechanical Cleaning Equipment: Automatic, dry shot blast type, self contained capable of recycling blast materials and collecting surface abrasions.

3.3 SURFACE PREPARATION

A. Mechanically clean concrete substrate and create surface profile in existing concrete substrate in accordance with ASTM D 4259.
   1. Mechanically clean concrete substrate to remove surface and penetrating contaminants to produce a surface profile of ICRI CSP 3 minimum, and greater as required by coating manufacturer in related sections, all in accordance with ICRI Technical Bulletin No. 03732.
   2. Acceptable substrate surfaces will be free of laitance, oil, grease, flooring adhesive, paint, and other surface contaminates capable of affecting bond of specified floor finishes to concrete substrate.

B. Repair surface irregularities after cleaning.
1. Fill bugholes, spalls, cracks, deteriorated joints and other surface damage exposed or created as a result of substrate cleaning operations flush with adjacent surfaces to provide sound substrate for specified floor finish.

C. Dry broom or vacuum clean concrete substrates immediately before application of specified floor finishes in accordance with ASTM D 4258 to remove loose materials on substrate surface.

D. When field quality control report indicates portions are unsatisfactory, repeat process until field quality control report indicates there are no unsatisfactory portions remaining.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:

1. Visual inspection of completed substrate preparation to verify contamination is removed.
2. Visual inspection of completed substrate preparation to verify surface profile matches ICRI profile required for specified coating or finish, using ICRI standard rubber mold for visual comparison.
3. Prepare field quality control report. Clearly indicate the locations, extents, and conditions of areas where surface preparation does not conform to specified profile and cleanliness. Document observed conditions with digital photographs.
4. Repeat inspections when additional surface preparation for unsatisfactory conditions indicated in the previous field quality control report.

3.5 PROTECTION

A. Protect prepared concrete substrates from contamination.

1. Reclean substrates that are contaminated by construction operations prior to installation of specified floor finishes.

- END OF SECTION -
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section Includes:
1. Concrete moisture content testing using relative humidity method.
2. Concrete pH testing.

1.3 RELATED REQUIREMENTS
A. Division 03 sections specifying concrete substrates and finishing concrete surfaces.
B. Section 07 2633 "Moisture Mitigation Control Coatings".
C. Division 09 flooring sections specifying adhered flooring and accessories requiring moisture and pH testing.

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

1.5 ADMINISTRATIVE REQUIREMENTS
A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
B. Scheduling: Schedule work to permit concrete moisture testing to be completed minimum one week and maximum 3 weeks before floor coverings are installed.
1.6 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Submit data indicating model, manufacturer, and calibration record for relative humidity measuring equipment.
   2. Submit data for floor slab treatment products.

B. Shop Drawings:
   1. Indicate test locations shown on building floor plans.

1.7 INFORMATIONAL SUBMITTALS

A. Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for concrete moisture acceptable limits.

B. Test Reports: Report test results in chart form.
   1. Relative Humidity Test Method: Indicate test dates, time, depth of test well, in-situ temperature, relative humidity and pH levels.
   2. Submit record of ambient air temperature, ambient relative humidity, and floor slab surface temperature when test sites are prepared, start of test, and end of test.
   3. Indicate condition of building enclosure including position of operable windows and exterior doors when test sites are prepared, start of test, and end of test.
   4. Submit transcript of datalogger.
   5. Indicate operational status of HVAC systems maintaining environmental condition of spaces where tests are conducted when test sites are prepared, start of test, and end of test.

1.8 FIELD CONDITIONS

A. Ambient Conditions:
   1. Do not perform concrete moisture testing until building is enclosed and HVAC system is operational.
   2. Maintain building test areas at design operating conditions for minimum 48 hours before, during, and continuously after conducting testing.
   3. When HVAC system is not operational at start of tests, maintain ambient conditions within test areas at 65 to 85 degrees F and 40 to 60 percent relative humidity for minimum 48 hours before, during, and continuously after conducting testing until building HVAC system is capable of maintaining design operating conditions.

PART 2 - PRODUCTS

2.1 RELATIVE HUMIDITY TEST EQUIPMENT

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
3. Substitutions: Section 01 2500.

B. Humidity and Temperature Probe and Meter: Comply with ASTM F2170.

### 2.2 PH TEST MATERIALS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Micro Essential Laboratory; [www.microessentiallab.com](http://www.microessentiallab.com).
   2. Substitutions: Section 01 2500.

B. pH Test Paper: Capable of indicating minimum 7.0 to 13 pH range.

C. pH Color Gage: Furnish pH test paper manufacturer's visual color gage to identify measured pH.

D. Water: Distilled or de-ionized.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

A. Verify new concrete floors have cured minimum 28 days.

#### 3.2 PREPARATION

A. When a building HVAC system is not operational and maintaining test areas at design operational conditions, install recording hygrometer or data logger in each separate test area to record ambient temperature and relative humidity beginning 48 hours before start of tests until completion of tests within each area.

B. Identify three moisture test sites for first 1,000 sf and one moisture test site for each additional 1,000 sf of floor area receiving floor covering on each separate floor slab.
   1. Layout test site locations uniformly distributed throughout each test area.

#### 3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform concrete moisture tests and inspections and prepare test reports.

B. Acceptance Criteria:
   1. Concrete floor slabs will be considered acceptable for installation of floor finishes when:
      a. Relative Humidity Test Result: 75 percent maximum relative humidity.
      b. pH Test Result: Within alkalinity range of 7.0 to 9.0.

C. Concrete Moisture Testing – General
1. Conduct relative humidity test at each test site.
2. Conduct one pH test at each test site.

D. Relative Humidity Testing:
1. Perform tests in accordance with ASTM F2170.
2. Conduct relative humidity testing at the following depths:
   a. Basement Slabs and Slabs-On-Grade: Measure temperature and relative humidity at 40 percent of slab thickness measured from top surface.
   b. Elevated Slabs: Measure temperature and relative humidity at 20 percent of slab thickness measured from top surface.
3. Drill test hole at each test site to accommodate test sleeve.
   a. Hole Diameter: In accordance with test equipment manufacturer’s instructions.
   b. Drilling Fluids: Not permitted.
4. Vacuum dust and debris from test hole.
5. Insert sleeve, to the full depth of test hole. Cap or plug sleeve to prevent test hole contamination.
6. Permit the test site to acclimate for minimum 72 hours before measuring relative humidity.
7. Remove sleeve plug and insert probe to bottom of test hole. Allow test probe to reach temperature equilibration with concrete slab.
8. Measure and record temperature and relative humidity at the test site.

E. pH Testing:
1. Place several drops of water onto the concrete surface to form a puddle approximately 1 inch in diameter.
2. Allow the water to set for approximately 60 seconds
3. After 60 seconds, dip the pH paper into the water and remove immediately, compare color to chart provided by paper supplier to determine pH reading.
4. Record and report results.

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes non-load-bearing metal framing systems.
   1. Interior partitions.
   2. Cold-Formed Suspension systems for ceilings and soffits.
   3. Interior soffits.
   4. Exterior soffits.
   5. Interior furring.
   8. Accessory components including, but not limited to; Backing, Bridging, Bracing and flat strapping.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 05 5000 “Metal Fabrications” for items not specified in 09 2216.

1.4 REFERENCES


C. American Iron and Steel Institute (AISI), www.steel.org
   1. AISI's North American Specification for the Design of Cold-Formed Steel Structural Members.
2. AISI S100-07-S2-10, Supplement No. 2 to the North American Specification for the Design of Cold-Formed Steel Structural Members.
3. AISI S905-08, Test Methods for Mechanically Fastened Cold-Formed Steel Connections, including Supplement No. 1.

D. ASTM International:
2. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM E 413 - Classification for Rating Sound Insulation.


F. Underwriters Laboratories, Inc. (UL):

1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

C. CAL-GREEN Submittals:
1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

D. Evaluation Reports: From ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
1. Steel studs and runners / tracks.
2. Embossed steel studs and runners / tracks.
3. Firestop tracks.

E. Qualification Data: For manufacturer and Installer.
1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Current member of one of the following organizations.
   1. CSSA, Certified Steel Stud Association; [www.certifiedsteelstud.com](http://www.certifiedsteelstud.com).
   2. SFIA, Steel Framing Industry Association; [www.steelframingassociation.org](http://www.steelframingassociation.org).
   3. SSMA – Steel Stud Manufacturers Association; [www.ssma.com](http://www.ssma.com).
   4. SSFSA - Supreme Steel Framing System Association; [www.supremesteelframing.net](http://www.supremesteelframing.net).

B. Installer Qualifications: Minimum five (5) years documented experience in work of this Section.

C. Pre-Installation Conference: Conduct at Project site.

1.7 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage.

B. Stack studs and tracks flat and supported on risers on a flat platform to prevent sagging.

1.8 WARRANTY

A. Comply with provisions of Section 01 7700 “Closeout Procedures”.

B. Manufactured Ceiling Suspension System:
   1. Provide single source warranty.
   2. Suspensions System: Submit a written limited warranty executed by the manufacturer, agreeing to repair or replace grid components that are supplied with a hot-dipped galvanized coating or aluminum base material.
      a. Failures include, but are not limited to:
         1) The occurrence of 50 percent red rust as defined by ASTM D 610 test procedures as a result of defects in materials or factory workmanship.
   3. Warranty Period: Grid: Ten (10) years.
   4. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 and displaying a classification label from an independent testing agency.
1. Construct fire-resistive rated partitions in compliance with tested assembly requirements indicated on Drawings.
2. Rated assemblies to be substantiated from applicable testing using products in compliance with this specification and approved Shop Drawings.

C. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

D. Horizontal Deflection (Unless indicated to be thicker mil thickness or more restrictive criteria on Drawings):
   1. For wall assemblies, limited to L/240 of the wall height based on horizontal loading of 10 lbf/sq. ft. (480 Pa).
   2. If partition height exceeds stud manufacturer's limiting height for applicable loading and deflection, install bracing above ceiling, decrease stud spacing, or increase stud gauge as approved by Architect.

E. Vertical Deflection: Provide cold-formed metal framing and firestop tracks capable of withstanding deflection within limits and under conditions indicated.
   1. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
      a. Upward and downward movement of 3/4 -inch (19 mm) unless otherwise indicated and/or required by specific wall design.

   1. Criteria (Metal Studs):
      a. Design Thickness: 0.0312 inch.
      b. Minimum Thickness: 0.0296 inch (0.752 mm) (20 gauge) (30 mils) (20 gauge).
      c. Yield Strength: 33 ksi.
      d. Tensile Strength: 45 ksi.
   2. Performance:

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<tr>
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<th>SHEAR</th>
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<th>PULL OVER</th>
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<td>#6 (0.138 –inch dia. &amp; 0.25 –inch head)</td>
<td>94 lbs.</td>
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<td>129 lbs.</td>
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<td>#8 (0.164 –inch dia. &amp; 0.3125 –inch head)</td>
<td>102 lbs.</td>
<td>47 lbs.</td>
<td>161 lbs.</td>
</tr>
<tr>
<td>#10 (0.190 –inch dia. &amp; 0.34 –inch head)</td>
<td>111 lbs.</td>
<td>55 lbs.</td>
<td>175 lbs.</td>
</tr>
<tr>
<td>#12 (0.216 –inch dia. &amp; 0.34 –inch head)</td>
<td>118 lbs.</td>
<td>63 lbs.</td>
<td>N/A</td>
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</table>
### 2.2 NON-LOAD-BEARING STEEL FRAMING

**A. Acceptable Manufacturers:**
1. CEMCO, California Expanded Metal Products Co., City of Industry, CA; [www.cemcosteel.com](http://www.cemcosteel.com).
3. MBA Building Framing, Libertyville, IL; [www.mbastuds.com](http://www.mbastuds.com).
4. MRI Steel Building Framing, LLC, Gary, IN.; [www.mristeelframing.com](http://www.mristeelframing.com).
5. SCAFCO Corporation, Spokane, WA; [www.scafco.com](http://www.scafco.com).

**B. Studs and Runners:** ASTM C 645, use either non-embossed steel studs and runners / tracks or embossed steel studs and runners / tracks.

1. **Steel Studs and Runners / Tracks (Non-Embossed):**
   a. Minimum Base Metal Thickness: **0.0296 inch (0.752 mm) (30mils) (20 gauge).**
   b. Strength: 33 ksi, minimum.
   c. Depth: As indicated on Drawings.

2. **Steel Studs and Runner/Tracks (Embossed):**
   a. ProSTUD 30MIL 33ksi or ProTRAK 30MIL 33ksi with embossed flanges manufactured by ClarkDietrich Building Systems.
      1) Minimum Base-Metal Thickness: **0.0296 inch (0.752 mm) (30 mils) (20 gauge).**
      2) Depth: As indicated on Drawings.

**C. Slip-Type Head Joints:** Where indicated, provide one of the following.

1. **Clip System:** Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to runners while allowing **1-1/2 inch (38 mm) minimum vertical movement,** unless otherwise indicated on Drawings.
   a. FAST TOP™ Clip (FTC3, FTC5 or FTC8) manufactured by ClarkDietrich Building Systems.
   b. REDIKLIP and POSIKLIP manufactured by FireTrak Corporation; [www.firetrak.com](http://www.firetrak.com).
   c. Substitutions: Per Division 01.
2. Single Long-Leg Runner System: ASTM C 645 top runner with 2 inch (51 mm) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.

3. Double-Runner System: ASTM C 645 top runners, inside runner with 2 inch (51 mm) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
   a. DOUBLETRACK™ System manufactured by ClarkDietrich Building Systems.
   b. Substitutions: Section 01 2500.

4. Deflection Track (Slotted Leg): Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
   a. CST Brand Slotted Track manufactured by CEMCO.
   b. MaxTrack® Slotted Deflection Track manufactured by ClarkDietrich Building Systems.
   c. Slotted Track manufactured by MBA Building Framing.
   d. Supreme Slotted Track manufactured by SCAFCO Corporation.
   e. TRUE-ACTION™ SLOTTED TRACK manufactured by Telling Industries.

A. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness compatible with studs and in width to accommodate depth of studs.
      a. HW-D UL-classified, tested and listed in accordance with UL 2079, ASTM E 119 and ASTM E 814.
      b. Assembly Rating: 1 hour or greater.
      c. Nominal Joint Width: 3 inches, unless allowed otherwise by BlazeFrame tested assembly.
      d. Movement Capabilities: Minimum of 40 percent compression or extension for deflection type tracks.
   2. Alternate Manufacturers:
      b. Substitutions: Per Division 01.

B. Control Joint Backer: Metal profile which supports intumescent materials located inside and spanning gap between opposing drywall edge at control joint locations.
   2. 0.018 inch (0.45 mm) by 3-1/4 inch (82.6 mm) width.

C. Backing Plate: Proprietary fire-resistance-treated blocking and bracing in width indicated.
      a. Products:
         1) D16F: 16 inches o.c. spacing.
         2) D24F: 24 inches o.c. spacing.
b. Width: 5 -1/8 inch.

c. Performance:
1) D16F: 814 lbs shear load maximum.
2) D24F: 725 lbs shear load maximum.

d. Fire Retardant Treatment: Dricon® fire-retardant treated wood (FRT).
1) Fire Retardant: Class A.
2) EPA Registered: NER approved, NER-303.
3) FSC Certified: Yes, Chain of Custody #BV-COC-008121.

2. Substitutions: Per Division 01.

D. Channel Bridging and Bracing: Steel, 0.0538 inch (1.37 mm) minimum base-metal thickness, with minimum 1/2 inch (13 mm) wide flanges.
   a. Depth: As indicated on Drawings, but not less than 7/8 inch by 7/8 inch by 50 inches (22.2 mm by 22.2 mm by 1270 mm).

2. Substitutions: Per Division 01.

E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated but not less than 6 inches wide by 10 foot lengths.
1. Acceptable Manufacturers:
   a. Meeting specified criteria and supplied by same manufacturer as metal stud framing.

2. Minimum Base Metal Thickness:
   a. 0.0428 inch (43 mils) (18 gauge).

F. Cold-Rolled Channel Bridging: Steel, 0.0538 inch (1.367 mm) (54 mils) (18 gauge) minimum base metal thickness, with minimum 1/2 inch (13 mm-) wide flanges.
1. Acceptable Manufacturers:
   a. Meeting specified criteria and supplied by same manufacturer as metal stud framing.

2. Depth: As indicated on Drawings, otherwise 1-1/2 inches (38 mm).
3. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.0538 inch (1.367 mm) (54 mils) (14 gauge) thick, galvanized steel.

1. Acceptable Manufacturers:
   a. Meeting specified criteria and supplied by same manufacturer as metal stud framing.

2. Minimum Base Metal Thickness:
   a. 0.0329 inch (0.836 mm) (33 mils) (20 gauge).

3. Depth: As indicated on Drawings, otherwise to be selected from the following as required for specific condition.
   a. 7/8 inch (22.2 mm).
   b. 1/2 inches (38 mm).

H. Resilient Furring Channels:
1. Single leg 1/2 inch (13 mm) deep by 0.0179 inch (0.0455 mm) (18 mils) (25 gauge) minimum, steel sheet members designed to reduce sound transmission.
2. Double legs at 1/2 inch (13 mm) deep by 0.0179 inch (0.0455 mm) (18 mils) (25 gauge) minimum, steel sheet members designed to reduce sound transmission.
   a. Configuration: Hat shaped with double legs.

I. Cold-Rolled Furring Channels: 0.0538 inch (1.37 mm) (54 mils) (16 gauge) uncoated-steel thickness, with minimum 1/2 inch (13 mm) wide flanges.
   1. Depth: As indicated on Drawings.
      a. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum base steel thickness of 0.0329 inch (0.836 mm) (33 mils) (20 gauge).
   2. Tie Wire: ASTM A 641, Class 1 zinc coating, soft temper, 0.0625 inch (1.59 mm) diameter wire, or double strand of 0.048 inch (1.21 mm) diameter wire.

J. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (31.8 mm), wall attachment flange of 7/8 inch (22.2 mm), minimum bare-metal thickness of 0.0179 inch (0.0455 mm) (18 mils) (25 gauge), and depth required to fit insulation thickness indicated.

K. Radius Framing: Steel sheet runner for non-load-bearing curves, bends, variable radii and arches using a work-hardened steel base strip.
   1. Framing Contour Track (CNTB) manufactured by ClarkDietrich Building Systems.
      a. Minimum Base Metal Thickness: As indicated on Drawings, but not less than 0.0296 inch (0.75 mm).
      b. Depth: As indicated on Drawings.
   2. Substitutions: Per Division 01.

L. Headers and Jambs: Manufacturer's proprietary shape used to form header beams and jambs, columns or posts, of web depths indicated, unpunched, with stiffened flanges and as follows:
   1. Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems as listed below for application, comparable product or an engineered header assembly.
      a. Heavy Duty Studs – HDS.
      b. Header Bracket – HDSC.
      c. RedHeader RO (Rough Opening System).
   2. Minimum Base Metal Thickness: As required to meet span and loading.

M. Framing Member Protective Coating: Corrosion resistance coating complying with ASTM A 653, G40 (Z120), hot-dip galvanized unless otherwise indicated.
   1. Provide G60 coating for all framing at damp/wet locations such as restrooms.
   2. Provide G60 coating for all framing carrying a load greater than 10 lbf/sq. ft. (480 Pa).

2.3 CEILING SUSPENSION SYSTEMS, MANUFACTURED

A. Structural Classification:
   1. Main Beam shall be heavy duty per ASTM C 635.
   2. Classification can require wires to be closer together for additional loading when used to support double layer gypsum, verticals, slopes, domes, half barrels, circles, soffits, canopies, and step conditions which call for loading or unusual designs and shapes in drywall construction. Using cross tees in the construction of circles, barrels, etc. is common in order to hold the radius.
3. Deflection of fastening suspension system supporting light fixtures, ceiling grilles, access doors, verticals and horizontal loads shall have a maximum deflection of 1/360 of the span.

B. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Products: Subject to compliance with requirements, provide one of the following:
   c. USG, United State Gypsum Company; www.usg.com
   d. DONN® Drywall Suspension System (USG Corporation)

C. Components:

1. Main Beam: Shall be double-web construction (minimum 0.0179 -inch prior to protective coating, ASTM C645 G90), hot dipped galvanized (per ASTM A653).
   a. Specific components as required for complete installed system.

2. Primary Cross Tees: Shall be double-web steel construction (minimum 0.0179 inch prior to protective coating, ASTM C645), hot dipped galvanized (minimum G90 per ASTM A653)
   a. Specific components as required for complete installed system.

3. QuikStix Soffits DGS: Shall be double web steel construction (minimum 0.0179 -inch prior to protective coating, ASTM C645), Tees designed for creating soffits; 1 1/2 -inch web height. 1 1/2 -inch flange, flattened bulb, bending crimp, knockouts and alignment holes to facilitate creating 15, 30, 45, 60 and 90 degree angles; ASTM A653 G90 hot dipped galvanizing.
   a. Specific components as required for complete installed system.

4. Wall Molding:
   a. Specific components as required for complete installed system.

5. Transition Molding, Gypsum Board to Acoustical ceiling: Specific components as required for complete installed system.

6. Clips: Specific components as required for complete installed system.

7. Screws: Bugle head screws in accordance with thickness of material used.

8. Hanger Wire: Galvanized Steel, 9 Gauge Diameter (0.148 inch).

9. Metal Trim or Plastic Members:
   a. Corner bead: Minimum #26 gauge, zinc alloy or plastic square edge type with expanded flanges.
   b. Casing bead: Minimum #24 gauge, zinc alloy or plastic square edge type with expanded flanges.
   c. Control Joints: Minimum #26 gauge, roll-formed zinc alloy, extruded aluminum or plastic with expanded flanges.
   d. Special Trim Shapes: As detailed on plans, extruded aluminum with acrylic coating by Fry Reglet or approved equal.

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing:
   a. Bugle head screws in accordance with thickness of material used.
   b. Casing bead: Minimum #24 gauge, zinc alloy or plastic square edge type with expanded flanges.
   c. Control Joints: Minimum #26 gauge, roll-formed zinc alloy, extruded aluminum or plastic with expanded flanges.
   d. Special Trim Shapes: As detailed on plans, extruded aluminum with acrylic coating by Fry Reglet or approved equal.
a. Attachment to substrates: Of type, material, size, corrosion resistance, holding power and other properties required to fasten steel members to substrates and meet design requirements.

b. Framing attachment to framing and accessory components: Of type, material, size, corrosion resistance, holding power and other properties required to meet design requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions with Installer present for compliance with requirements, installation tolerances, and other conditions affecting performance of the Work.

B. Verify preparatory work by other trades is complete.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

A. Coordinate with other trades for installation in advance of time needed for coordination and construction.

B. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

2. Coordinate with Drawings for types allowed and required.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

1. Provide flat plate blocking at roof parapet framing for attachment of reglets and flashing items at intervals closer than stud spacing.
D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members.
   1. Frame both sides of joints independently.

3.4 FRAMED ASSEMBLY INSTALLATION

A. Install framing system components according to spacing indicated, but not greater than spacing required by referenced installation standards for assembly types.
   1. Single-Layer Application:
      a. 16 inches (406 mm) on center unless otherwise indicated.
   2. Multilayer Application:
      a. 16 inches (406 mm) on center unless otherwise indicated.
   3. Tile Backing Panels:
      a. 16 inches (406 mm) on center unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
   1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
   2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
      a. Install two studs at each jamb, unless otherwise indicated.
      b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2 inch (13 mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
      c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
   3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
   4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
      a. Firestop Track: Where indicated and/or required by wall design, install to maintain continuity of fire-resistance-rated assembly indicated.
   5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
   6. Curved Partitions:
      a. Install radius framing to uniform curve and locate straight lengths so they are tangent to arcs.
b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of not less than two (2) studs at ends of arcs, place studs 6 inches (150 mm) o.c.

E. Shaft Walls:
1. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.
2. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.

F. Direct Furring:
1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
2. Attach to metal stud and track framing with type, material, size, corrosion resistance, holding power and other properties required to meet design requirements.

G. Z-Furring Members:
1. Vertically erect insulation specified in Division 7 Section "Thermal Insulation" and hold in place with Z-furring members spaced 24 inches (610 mm) o.c.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (600 mm) o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (300 mm) from corner and cut insulation to fit.

H. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.5 INSTALLING SUSPENSION SYSTEMS, MANUFACTURED

A. General:
1. Install manufactured suspension system components in sizes and spacings per manufacturer's engineered design, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.
2. Install suspension system and panels in accordance with the manufacturer's instructions, in compliance with ASTM installation standard, and with applicable codes as required by the authorities having jurisdiction.
3. The Armstrong Drywall Grid System can be installed in interior or exterior applications.
4. To secure to metal clips, concrete inserts, steel bar joist or steel deck, use power actuated fastener, or insert. Coordinate placement for hanger wire spaced as required for expected ceiling loads and layout.
5. Install hanger wire as required with necessary on center spacing to support expected ceiling load requirements, following local practices, codes and regulations.
   a. Provide additional wires at light fixtures, grilles, and access doors where necessary.
   b. A pigtail knot shall be used with three tight wraps at top and bottom fastening locations.

6. Add additional wire as needed when using compatible clips and accessories.

7. Control Joints: Roll formed zinc alloy, aluminum, or plastic as required for expansion and contraction as shown on drawings.

8. Expansion Joints: Roll formed zinc alloy, aluminum, or plastic as required for expansion and contraction as shown on drawings.

9. Main beams shall be suspended from the overhead construction with hanger wire, spaced as required for expected ceiling loads, along the length of the main beams.

10. Install main beams and cross tees at the on center spacing required for ceiling loading, and location of in-ceiling services.

11. Use channel molding or angle molding to interface with Drywall Grid System to provide perimeter attachment or to obtain drop soffits, verticals, slopes, etc.

12. For light fixtures (Type G, Type F) use secondary framing cross tees as required to frame opening.

13. Single cross tees in a route hole to be secured by 7/16-inch framing screw or alternative methods.

14. Additional wind uplift and seismic bracing as required by code.

B. Exterior Cement Plaster Application:

1. Install the main beams with 9-gauge wires. Space main beams 36” on center. Hanger wire and compression post spacing as required for specific wind load and plenum depth.

2. Install 36” cross tee to required on-center spacing. Isolation at perimeters is mandatory when installing any stucco system. Install perimeter channel molding at wall/ceiling junctures to support tees independent of walls. Use main beam at cut cross tee perimeters and galvanized track on main beam perimeters.

3. Install 3.4 Lb. 3/8” galvanized diamond mesh lath with wafer head sharp point screw to cross tees (use cadmium coated screws on exterior applications).

4. Lath: 3/8”, 3.4# flat rib diamond mesh lath 27” x 8’-0”.

5. Expansion Joints: Installed in accordance with Metal Lath/Steel Framing Association Specifications/Standards.

6. Control Joints: Installed in accordance with Metal Lath/ Steel Framing Association Specifications & Standards.

7. Plaster stops, grounds, and corner pieces are attached to system with wafer head screws and/or 18 gauge tie wire.

8. Plaster or stucco mixture and thickness to be in accordance with manufacturer’s recommendations and applied as specified in related section and per ASTM C926 For Portland Cement-based Plaster.

9. For exterior application use steel studs for vertical bracing, spacing per suspension system manufacturer recommendations for wind loads indicated on Drawings.

C. Interior Applications:

1. Install main beams and cross tees at the on center spacing required for ceiling loading, and location of in-ceiling services.

2. Install cross tees at on center spacing as specified by the drywall manufacturer.
   a. Typical drywall cross tee spacing:
b. 16-inches on center with 5/8-inch or 1/2-inch gypsum board

c. 24-inches on center with 5/8-inch gypsum board

3. Additional bracing as required by code.

3.6 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, fasteners, scrap metal, and other discarded materials from Project site including removing all rubbish, fasteners, and foreign materials from inside wall framing cavities and tracks.

B. All galvanized steel finishes shall be field repaired after framing operations are complete.

C. Remove any water or moisture that accumulates in wall cavities and tracks.

D. Protect work of other trades against damage from framing operation.

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Interior gypsum wall board, including fire resistant and moisture resistant gypsum wall board.
   2. Interior gypsum ceiling board.
   3. Perforated Gypsum Board.
   4. Joint treatment and surface finishes.
   5. Wall joint reveals.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 09 2216 “Non-Structural Metal Framing” for interior partition framing.

D. Section 09 3013 “Tiling” for cementitious backing panels.

E. Section 09 9123 "Interior Painting" for primers applied to interior gypsum board surfaces.

1.4 REFERENCES


C. Gypsum Association:
   1. GA-214 - Recommended Levels of Gypsum Board Finish.

D. Underwriters Laboratories, Inc. (UL):
   1. UL Fire-Resistance Directory.

E. ASTM International standards and testing procedures as listed in this Section.

1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

D. Samples: For the following products.
   1. Trim Accessories: Full-size Sample in 12 inch (300 mm) long length for each trim accessory indicated.

E. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.

1.6 QUALITY ASSURANCE

A. Applicator Qualifications: Acceptable to manufacturer with documented experience on at least 5 projects of similar nature in past 5 years.

B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

D. Mockups: Before beginning gypsum board installation, install mockups of at least 100 square feet (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Install mockups for the following:
      a. Each level of gypsum board finish indicated for use in exposed locations.
   2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
   3. Simulate finished lighting conditions for review of mockups.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
1.7 DELIVERY, STORAGE AND HANDLING
A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.
C. Handle gypsum board to prevent damage to edges, ends, and surfaces.
D. Do not bend or otherwise damage metal corner beads and trim.

1.8 ENVIRONMENTAL REQUIREMENTS
A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations, whichever are more stringent.
B. Room Temperatures:
   1. For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F.
   2. For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F for 48 hours prior to application and continuously after until dry.
   3. Do not exceed 95 deg F when using temporary heat sources.
C. Ventilation: Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.
D. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
E. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.
B. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

C. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

B. Mold Resistance: Score of 10 when tested in accordance with ASTM D 3273.

1. Provide mold-resistant board where indicated.

2.3 INTERIOR GYPSUM BOARD / PANELS

A. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include those specified as Basis of Design and those specifically listed for each type as Alternates.

1. CertainTeed Corp, Saint-Gobain; [www.certainteed.com](http://www.certainteed.com).
4. PABCO Gypsum; [www.pabcogypsum.com](http://www.pabcogypsum.com).
5. USG Corporation; [www.usg.com](http://www.usg.com).

B. Gypsum Wall Board Panels: Type X, ASTM C 1396 with heavy duty paper each side and non-combustible core.

2. Alternate available products that may be incorporated into the Work include the following:
   a. CertainTeed, Type X Gypsum Board.
   b. National Gypsum, Gold Bond Brand Fire Shield Gypsum Board.
   c. PABCO®, Gypsum Flame Curb®.
   d. USG, Sheetrock Brand FireCode.
3. Core Thickness: 5/8 inch (15.9 mm).
5. Fire Resistant: Yes.

C. Gypsum Ceiling Board Panels: Type X, ASTM C 1396, special sag-resistant gypsum ceiling board.

2. Alternate available product that may be incorporated into the Work include the following:
   a. USG, SHEETROCK® Mold Tough.
3. Core Thickness: 5/8 inch (15.9 mm).
5. Fire Resistant: Yes.
6. Mold Resistance: Score of 10 when tested in accordance with ASTM D 3273.

D. Mold Resistant Gypsum Board Panels: Type X, ASTM C 1658, ASTM C 1396, ASTM C 1178, glass-mat faced, mold and mildew resistant interior wall panel with fiberglass mat facing laminated to both sides. Specifically designed for interior use.
   2. Alternate available products that may be incorporated into the Work include the following:
      b. USG, Sheetrock Brand®, Glass-Mat Panels, Mold Tough®, Firecode® X.
   3. Core Thickness: 5/8 inch (15.9 mm).
   5. Fire Resistant: Yes.
   6. Mold Resistance: Score of 10 when tested in accordance with ASTM D 3273.

E. Moisture Resistant Gypsum Board Panels: Type X, ASTM C 1178, water-resistant glass-mat faced backing board with manufacturer’s standard edges. Use in high humidity or wet areas where cementitious backer panels are not scheduled.
   1. Basis of Design Product: DensShield Tile Backer manufactured by GP, Georgia Pacific Gypsum LLC.
   2. Alternate available products that may be incorporated into the Work include the following:
   3. Core Thickness: 5/8 inch (15.9 mm).
   4. Mold Resistance: Score of 10 when tested in accordance with ASTM D 3273.
   5. Fire Resistance: Yes.

2.4 NOT USED
2.5 TRIM ACCESSORIES

A. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include those specified as Basis of Design and the following:

B. Accessories for Interior Installation: Corner beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:
   1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, or paper-faced galvanized steel sheet.
   2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
      a. Expansion / Control Joint: One-piece control joint formed with V-shaped slot, with removable strip covering slot opening.
      b. Provide cornerbead on outside corners.
         1) Use Standard Corner Beads unless otherwise indicated.
         2) Use Bullnose Beads where indicated.
      c. LC-Bead: J-shaped, with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.
      d. L-Bead: L-shaped, with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
      e. U-Bead: J-shaped, with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
      f. Arch Cornerbead: Use Standard or Bullnose shape with factory-notched or flexible flanges.
   3. Field Finish: Paint as required for accessory material per Division 09 Section “Interior Painting.”
      a. Field paint to match wall color, refer to Drawings.
      b. Field paint to match ceiling color, refer to Drawings.

C. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
   1. Subject to compliance with requirements, provide products by one of the following manufacturers:
   2. Aluminum: 6063-T5, alloy and temper with not less than the strength and durability properties of ASTM B 221/B 221M.
   3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.
   4. Refer to Drawings for aluminum trim types and locations.
2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.
   1. Use pressure-sensitive or staple-attached open-weave glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.

C. Joint Tape for Tile Backing Panels: Glass-fiber mesh tape.
   1. Use glass-fiber mesh tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for tile applications.

D. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
   1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
   2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
      a. Use setting-type compound for installing paper-faced metal trim accessories.
   3. Fill Coat: For second coat, use drying-type, all-purpose compound.
   4. Finish Coat: For third coat, use drying-type, all-purpose compound.
   5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

E. Joint Compound for Tile Backing Panels:
   1. Glass-Mat, Water-Resistant Backing Panel: Glass-Fiber Mesh tape and joint compound as recommended by backing panel manufacturer.

F. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
   1. Acceptable Products: Tuff-Hide™ Primer-Surfacer manufactured by United States Gypsum Company (USG), or product recommended by gypsum board manufacturer.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer’s written recommendations.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
   1. Provide product recommended by gypsum board manufacturer and complying with VOC limits specified in Section 01 6116.

C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated. Types to suit framing substrates indicated. Lengths as required to fully penetrate all attached layers and structural support.
   1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 inch to 0.112 inch (0.84 to 2.84 mm) thick.

D. Gypsum Board and Panel Adhesives and Primers: Provide products recommended by gypsum board manufacturer and complying with VOC limits specified in Section 01 6116.
1. Modified Contact Adhesive: As recommended by the gypsum board manufacturer and having a placement time before setting of at least 15 minutes.

2. Joint Compound Adhesive: As recommended by the gypsum board manufacturer.


E. Sealant for Tile Backing Panels: As specified in Division 07 Section "Joint Sealants."

F. Acoustical Sealant: As specified in Division 07 Section "Joint Sealants."

**PART 3 - EXECUTION**

3.1 **EXAMINATION**

A. Examine framing, substrates and door frames, with Installer present for compliance with requirements and other conditions affecting performance.

B. Verify that joint sealant work in adjoining surfaces is complete. Delay application until sealants have cured.

C. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 **APPLYING AND FINISHING PANELS, GENERAL**

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panel’s not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16-inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control joints and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

1. **Walls:**
   a. Where joints are not shown, provide at a maximum dimension of 30 feet o.c. for walls in vertical and horizontal directions.

   1) Provide shop drawings for control joints for review and approval.

   2) Refer to Drawings for deviations from spacing requirements.
2. Ceilings:
   a. Where joints are not shown, provide at a maximum dimension of 50 feet o.c. and limit overall square footage of uninterrupted ceiling plane to 2500 square feet.
      1) Provide shop drawings for control joints for review and approval.
      2) Refer to Drawings for deviations from spacing requirements.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
   1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
   2. Fit gypsum panels around ducts, pipes, and conduits.
   3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4 inch to 3/8 inch (6.4 to 9.5 mm) wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4 inch to 1/2 inch (6.4 to 12.7 mm) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: Seal construction at perimeters, at corrugated steel deck, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
   1. Install gypsum board panels in full height from floor to ceiling in vertical arrangement over wall framing without horizontal butt joints.
      a. Multi-Layer Applications:
         1) Install first and second layers of gypsum board panels in full height from floor to ceiling in vertical arrangement over wall framing without horizontal butt joints.
         2) Second layer shall have vertical joints staggered in relationship to first layer.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD - SCHEDULE

A. Install interior gypsum board in the following locations (unless otherwise noted on Drawings):
   1. Gypsum Board Panels, Type X: 5/8 inch thick at vertical surfaces, typical unless otherwise scheduled or noted.
   2. Gypsum Ceiling Board Panels, Type X: Horizontal ceiling and soffit surfaces, unless otherwise indicated to be Glass-Mat, Mold and Mildew Resistant Interior Wall Panel Board.
3. Glass-Mat Mold and Mildew Resistant Interior Wall Panel Gypsum Board, Type X: Vertical and horizontal surfaces at the following locations unless receiving tile finish and locations noted to receive moisture resistant gypsum board.
   a. Interior face of exterior walls.
   b. Plumbing chases.
   c. Roof drain chases.
4. Moisture Resistant Gypsum Board Panels: Lavatories, urinals, eyewash stations, hand wash stations, and drinking fountains, as indicated on Drawings.
5. Impact Resistant Gypsum Board Panels: Service areas and delivery corridors as indicated on Drawings.

B. Single-Layer Application:
1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
   a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
   b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
   c. Acoustical wall assemblies:
      1) Install gypsum board panels in full height from floor to ceiling in vertical arrangement over wall framing without horizontal butt joints.
3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:
1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 -inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.
5. Acoustical Wall Assemblies:
   a. Install first and second layers of gypsum board panels in full height from floor to ceiling in vertical arrangement over wall framing without horizontal butt joints.
b. Second layer shall have vertical joints staggered in relationship to first layer.

D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer’s written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.

E. Curved Surfaces:
1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12 inch (300 mm) long straight sections at ends of curves and tangent to them.
   a. Acoustical Wall Assemblies:
      1) Install gypsum board panels in full height from floor to ceiling in vertical arrangement over wall framing without horizontal butt joints.
2. For double-layer construction, fasten base layer to studs with screws 16 inches (400 mm) o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches (300 mm) o.c.
   a. Acoustical Wall Assemblies:
      1) Install first and second layers of gypsum board panels in full height from floor to ceiling in vertical arrangement over wall framing without horizontal butt joints.
      2) Second layer shall have vertical joints staggered in relationship to first layer.

F. Gypsum: For gypsum materials with different face materials, make transitions at outside or inside corners typically.

3.4 APPLYING MOISTURE RESISTANT PANELS

A. Glass-Mat Moisture Resistant Backing Panel: Comply with manufacturer’s written installation instructions and install at locations indicated to receive tile.
1. Install with 1/4 inch (6.4 mm) gap where panels abut other construction or penetrations.
2. Install sealant as recommended by moisture resistant board manufacturer.
   a. Confirm joint size with manufacturer.

B. Areas Not Subject to Wetting:
1. Install gypsum board as Scheduled in this specification.

C. Where moisture resistant panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces

3.5 NOT USED
3.6 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 consistent with lines of building spaces and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:
   1. Cornerbead: Use at outside corners unless otherwise indicated.
   2. Bullnose Bead: Use where indicated.
   3. LC-Bead: Use at exposed panel edges.
   4. L-Bead: Use where indicated.
   5. U-Bead: Use at exposed panel edges.
   6. Curved-Edge Cornerbead: Use at curved openings.

D. Aluminum Trim: Install in locations indicated on Drawings.

3.7 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.
   1. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
1. Glass Mat Faced Gypsum Board: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.

D. Gypsum Board Finish Levels: Finish panels to levels indicated in the Finish Level Schedule Article as described below according to GA-214 and ASTM C 840.

1. Level 0: No taping, finishing, or accessories required.
2. Level 1: All joints and interior angles shall have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.
3. Level 2: All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
4. Level 3: All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. One additional coat of joint compound shall be applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges and suitable for coating with drywall primer specified in related Section.
5. Level 4: All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied over all flat joints and one separate coat of joint compound shall be applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges and suitable for coating with drywall primer specified in related Section.
6. Level 5: All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied over all flat joints and one separate coat of joint compound shall be applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. A thin skim coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied in accordance with manufacturer’s recommendations, applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.

E. Primer and its application to surfaces are specified in related Division 09 Sections.

3.8 TOLERANCES

A. Maximum Variation of Finished Board Surface from True Flatness:

1. 1/8 inch in 10 feet in any direction.

3.9 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.10 FINISH LEVEL SCHEDULE

A. Gypsum Board Finish Schedule: Finish panels to levels indicated below in the following locations:
   1. Level 0: Temporary Construction.
   2. Level 1: Ceiling plenum areas, concealed areas, and where specifically indicated.
   3. Level 2: Panels that are substrate for tile.
   4. Level 3: Not used.
   5. Level 4: Exposed surfaces in non-public areas unless otherwise indicated.
   6. Level 5: Exposed surfaces in public areas, and as follows:
      a. Gypsum board surfaces scheduled to receive semi-gloss and gloss interior paint (walls and ceilings in wet areas).
      b. Gypsum board surfaces scheduled to receive wall coverings.

B. Primers, wall covering and other finishes are specified in other Division 09 Sections.

- END OF SECTION -
- SECTION 09 3013 -

TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Porcelain tile
   2. Ceramic tile.
   4. Cementitious backing panels.
   5. Setting and grout materials.
   6. Cementitious underlayment.
   7. Waterproof / crack isolation membranes.
   8. Sealants.
   9. Metal edge strips.
  10. Miscellaneous materials.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 08 3113 “Access Doors and Panels” for access doors in tiled wall assemblies.

D. Section 08 7100 “Door Hardware” for metal thresholds.

E. Section Division 22, Plumbing Work, for floor drains and plumbing fixtures.

1.4 REFERENCES


D. American National Standards Institute, Inc. (ANSI):

E. ASTM International:
   2. ASTM A 666, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

F. Tile Council of North America (TCNA):

G. Underwriters Laboratories, Inc. (UL):
   1. UL 94 - Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.

1.5 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

B. Module Size: Actual tile size plus joint width indicated.

C. Face Size: Actual tile size, excluding spacer lugs.

D. Large Format Tile: Tile with any edge greater than 15 inches (381 mm).

E. Wet Area: Includes tile surfaces that are either soaked, saturated, or regularly and frequently subjected to moisture such as tub enclosures, showers, swimming pools, commercial kitchens and exterior areas.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
B. CAL-Green Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

C. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

D. Samples: The following samples are required.
   1. Sample for each type of tile and grout indicated.
   2. Manufacturer's full range of colors for Architect's selection. No additional cost allowance will be permitted for premium colors within Manufacturer's full range.
   3. Samples of accessories involving color selection.
   4. Samples of crack isolation membranes, waterproof membranes and backer boards.

E. Qualification Data: For Installer.

F. Sample Warranty: As specified.

G. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.
   2. Warranty: Submit executed warranty.
   3. Maintenance Data: For tile, to include in maintenance manuals.

H. Maintenance Materials Submittals:
   1. Furnish extra materials, including tile, trim shapes and grout, which match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
      a. Quantity: 3 percent of quantity installed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Use only thoroughly trained and experienced journeyman tile setters completely familiar with the requirements of this work and the recommendations contained in the referenced standards. No allowance will be made for lack of skill on the part of tile setters in acceptance or rejection of installed tile and related products.
   1. Shower System: Installer who holds current certification by manufacturer of system.

B. Source Limitations for Tile: Obtain tile of each type from one source or producer.
   1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
   1. Waterproof membrane.
   2. Crack isolation membrane.
5. Metal edge strips.

D. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Size: Minimum 3 feet x 3 feet for each type, color, and pattern in locations directed by Architect.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Pre-Installation Conference: Conduct at Project site.
   1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades including, but not limited to;
      a. General Contractor.
      b. Architect.
      c. Setting Material representative.
      d. Tile Installer.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.
   1. Comply with requirements in ANSI A137.1 for labeling tile packages.

B. Store materials in protected, dry conditions off of ground and in areas so as not to interfere with the progress of the work. Tile installation materials are to be stored and handled in accordance with ANSI A108.02, Section 2.0.

C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.

1.9 FIELD CONDITIONS

A. Environmental conditions for tile installation are to be in accordance with ANSI A108.02, Section 2.2.

B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

C. Illuminate the work area during installation providing the same level and angle of illumination as will be available for final inspection.
1.10 WARRANTY

A. Refer to General Conditions and Section 01 3300 for Contractor's General Guarantee requirements.

B. Assemblies: Provide single source warranty by setting, grout and liquid applied waterproof / crack isolation membrane manufacturer.
   1. Warranty Period: Twenty-five (25) years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Slip Resistance: For tile installed on walkway surfaces, stair treads and landings, provide products with the following values as determined by testing identical products per ANSI A137.1-2012, Section 9.6.
   1. Method: Dynamic Coefficient of Friction DCOF AcuTest method, wet test using 0.05 percent sodium lauryl sulfate solution.
   2. Application: Level interior flooring surface.
   3. Tested Value: 0.42 or greater.

C. Expansion Joints: In accordance with EJ171 of the TCNA Handbook for Ceramic, Glass and Stone Tile Installation. Provide at expansion joints in the backing materials, cold joints in concrete substrate or where backing materials change.
   1. Exterior Work and Interior Wet Locations: Provide on all surfaces maximum 12-feet on center in both axes.
   2. Interior Work, Not Otherwise Specified: Provide on continuous floor areas at intervals of 24 feet.

2.2 MATERIALS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
   1. Provide tile complying with Standard grade requirements unless otherwise indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
2.3 MANUFACTURERS – TILE

A. Subject to compliance with requirements, provide named products as specified.
   1. Substitutions: Section 01 2500.

2.4 MATERIALS - TILE

A. Floor Tiles: Products as indicated on the Drawings. Multiple products, colors and patterns required.
   1. Size and Shape: As indicated on Drawings.
   2. Color: As indicated on Drawings.
   3. Patterns: As indicated on Drawings.
   4. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes selected from manufacturer's standard shapes.
   5. Grout Color: As selected by Architect from manufacturer's full range of options.

B. Wall Tiles: Products as indicated on the Drawings. Multiple products, colors and patterns required.
   1. Size and Shape: As indicated on Drawings.
   2. Color: As indicated on Drawings.
   3. Patterns: As indicated on Drawings.
   4. Grout Color: As selected by Architect from manufacturer's full range of options.

C. Glass Tile: Products as indicated on the Drawings. Multiple products, colors and patterns required.
   1. Size and Shape: As indicated on Drawings.
   2. Color: As indicated on Drawings.
   3. Patterns: As indicated on Drawings.
   4. Grout Color: As indicated on Drawings.

2.5 MATERIALS – CEMENTITIOUS BACKING PANELS

A. Cementitious Backer Units (CBU): ANSI A118.9 or ASTM C 1325, Type A, in maximum lengths available to minimize end-to-end butt joints.

   1. Thickness: 5/8 inch.

C. Substitutions: Section 01 2500.

D. Joint Tape: 2 inch wide alkali-resistant glass fiber mesh tape.

E. Fasteners: Hot dipped galvanized fasteners per ASTM A 153.
2.6 MANUFACTURERS – INSTALLATION MATERIALS

A. Basis-of-Design Manufacturer: The design is based on “single source” products by MAPEI Corporation, www.mapei.com, as specified.
   1. Alternate Manufacturers: Subject to compliance with requirements including “System Warranty”, manufacturers offering ‘single source’ products that may be incorporated into the Work are:

B. Source Limitations for Setting Materials, Waterproof / Crack Isolation Liquid Applied Membrane, Grouts and Sealant:
   1. Obtain ingredients of uniform quality for each component from single manufacturer.

2.7 SETTING MATERIALS

A. Medium-Bed Mortar: Polymer fortified portland cement mortar complying with ANSI A118.4, ANSI A118.11 and ASTM C 627.
   1. Provide product that is approved by manufacturer for application thickness up to 3/4 inch.
   4. VOC Content: 0 g/L.
   5. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
      b. Custom Building Products, Natural Stone & Large Tile Mortar.

B. Thin-Bed Mortar (Thin-Set): Polymer fortified portland cement mortar complying with ANSI A118.4, ANSI A118.11 and ASTM C 627.
   1. For wall applications, provide mortar that complies with requirements for non-sagging mortar in addition to the other requirements in ANSI A118.4.
      a. Thin-Set Mortar gauged with Keralastic™ Latex Additive.
      b. System Warranty: 25 years.
   3. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
      b. Custom Building Products, ProLite® Premium Large Format Tile Mortar.

C. Glass Tile Mortar: Polymer-fortified non-sag adhesive mortar specifically formulated for glass tile applications, complying with ANSI A118.4, ANSI A118.11 and ASTM C 627. Consistent ultra-white color with minimal shrinkage, single-component, no admixture, anti-microbial.
      a. System Warranty: 25 years.
      b. VOC Content: 0 g/L.

2. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
   b. Custom Building Products, Glass Tile Premium Thin-Set Mortar.

2.8 GROUT MATERIALS

A. Polymer-Modified Cement-Based Grout Materials: Water-cleanable grout complying with ANSI A118.7.
      a. System Warranty: 25 years.
      b. VOC Content: 0 g/L.
   2. Subject to compliance with requirements, provide named product or equivalent product by one of the following:
      b. Custom Building Products, Prism® Color Consistent Grout.
      c. Ardex.

2.9 CEMENTITIOUS UNDERLAYMENT AND PRIMER

      a. System Warranty: 25 years.
   2. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:
      b. Custom Building Products, LevelQuik® Self-Leveling Underlayment.

B. Concrete Water-Based Substrate Primer: Surface preparation for self-leveling underlayment to seal porous surfaces and improve underlayment adhesion.
      a. System Warranty: 25 years.
   2. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:
      b. Custom Building Products, LevelQuik® Advance Acrylic Primer.

2.10 WATERPROOF / CRACK ISOLATION MEMBRANE – LIQUID APPLIED

A. General: Manufacturer’s standard product complying with ANSI A118.10 and ANSI A118.12 for thin-bed, medium-bed and thick-bed bonded mortar tile applications at walls, floors and ceilings.

2. VOC Content: 0 g/L.

C. Subject to compliance with requirements, provide named product or an equivalent product by one of the following:

D. Substitutions: Section 01 2500.

2.11 SEALANTS

A. General: Provide manufacturer's standard sealants with characteristics indicated below that comply with applicable requirements in Section 07 9200, Joint Sealants.
   1. Single-component, mildew-resistant, neutral-curing silicone sealant.
   2. Single-component, nonsag urethane sealant.
   3. Acrylic sealants not allowed.

B. Basis of Design: Mapesil AC manufactured by MAPEI Corporation.
   2. VOC Content: 18.5 g/L.

C. Subject to compliance with requirements, provide named products or equivalent products by one of the following:
   2. Custom Building Products, Commercial 100% Silicone Sealant.

D. Primer: Provide manufacturer's primer for use with porous stone, submerged and permanent wet areas.

E. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.

F. Refer also to Section 07 9200 for installation and preparation requirements.

G. Substitutions: Section 01 2500.

2.12 MISCELANEOUS MATERIALS

A. Metal Edge Strips: L, T and bullnose shapes as shown on Drawings, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications.
   1. Profiles, materials and finish as indicated. If none are indicated, provide stainless-steel, ASTM A 666, Type 302 exposed-edge material.
   3. Substitutions: Section 01 2500.
B. Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

C. Tile Protective Coating: Liquid grout-release coating that is formulated to protect exposed surfaces of stone tile and textured tile against adherence of mortar and grout.
   1. Compatible with mortar and grout products; easily removable after grouting is completed without damaging grout, stone tile or textured tile; and recommended for use as temporary protective coating for tile product.
   2. Floor sealer, complying with floor sealer specified in this Section, may be used provided it is recommended by manufacturer for use as a grout release.

D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

E. Grout Sealer (Non Epoxy Grouts): Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.
   1. VOC Content: Maximum 100 g/L.

F. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout. Colorless, no-sheen, water-based penetrating slip and stain-resistant sealer, not affecting color or physical properties of surfaces as recommended by tile manufacturers.
   1. VOC Content: Maximum 100 g/L.
   2. Products: Subject to compliance with requirements, products that may be incorporated into the Work are:
      a. Ultracare™ line of products manufactured by MAPEI Corporation; www.mapei.com
      b. STONETECH® Heavy Duty Grout Sealer Low Solids Coating manufactured by Laticrete International, Inc.; www.laticrete.com
      c. Aqua Mix® Sealer’s Choice® Gold manufactured by Custom Building Products; www.custombuildingproducts.com
   3. Substitutions: Section 01 2500.

**PART 3 - EXECUTION**

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
   2. Verify that concrete substrates for tile floors comply with surface finish requirements in ANSI A108.01 for installations indicated.
      a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.

3. 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.

4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer. Correct conditions that do not comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.

1. Remove protrusions, bumps, and ridges by sanding or grinding.

B. Remove coatings that are incompatible with tile-setting materials from substrates, including curing compounds and other substances that contain soap, wax, oil, or silicone.

C. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.

D. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

E. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, pre-coat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE BACKING PANEL INSTALLATION

A. Install panels and treat joints according to manufacturer's written instructions for type of application indicated.

3.4 WATERPROOF / CRACK ISOLATION MEMBRANE INSTALLATION

A. Install waterproof / crack isolation membrane to comply with ANSI A108.13, ANSI A108.17, and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely, or unbonded, to substrate.

3.5 TILE INSTALLATION

A. Comply with the TCNA Handbook for Ceramic, Glass, and Stone Tile Installation for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series specifications for installation of tile that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
B. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
   1. Tile floors in wet areas.
   2. Tile floors composed of tiles 8 inches x 8 inches or larger.
   3. Tile floors consisting of rib-backed tiles.
   4. Exterior tile floors.

C. Wipe backs of tiles with a damp cloth to remove dirt and dust before units are installed.

D. Mix tiles to achieve a uniformly random distribution of color shadings and patterns.

E. Pattern Orientation: For tile varieties with directional pattern, orient pattern as indicated on Drawings. If no pattern is shown, request direction from Architect.

F. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

G. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

H. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

I. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.

J. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
   1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
   2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
   3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
   4. Large format tile set in a running bond/brick joint pattern utilizing tiles with any side greater than 15 -inches, offset tiles shall be maximum of 1/3 of the tiles longest edge length.

K. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
   1. Porcelain Floor Tile: 1/8 inch to 3/16 inch.
   2. Glazed Wall Tile: 1/16 inch.

L. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
M. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated or according to the approved shop drawings, during installation of setting materials, mortar beds, and tile.
   1. Do not saw-cut joints after installing tiles.
   2. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
   3. Prepare joints and apply sealants to comply with requirements in Section 07 9200, Joint Sealants.

N. Thresholds: At locations where mortar bed (thick-set) would otherwise be exposed above adjacent floor finishes, set thresholds in latex-portland cement mortar (thin-set).
   1. Do not extend cleavage membrane waterproofing or crack isolation membrane under thresholds set in latex-portland cement mortar. Fill joints between such thresholds and adjoining tile set on cleavage membrane waterproofing or crack isolation membrane with specified sealant.

O. Metal Edge Strips: Install at locations indicated and where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated. Provide sizes required for transition.
   1. Where tile terminates at door openings, center strips under doors.

P. Grout Sealer: Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

Q. Floor Sealer: Apply floor sealer to cementitious grout joints in tile floors according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.6 GROUT INSTALLATION

A. Joints shall be packed full and free of all voids or pits, joints shall not be raked. Clean excess grout and mortar from tile surface with water as work progresses. Clean while mortar is fresh and before it hardens on the surface.

B. Cement Based Grout: Install accordance with ANSI A108.7 and A108.10 for cement based grout and the manufacturer's recommended procedures and precautions during application and cleaning.

3.7 INSTALLATION TOLERANCES

A. Variation from Plumb for Wall Tile: For vertical joints, external corners, and other conspicuous lines, do not exceed 1/8 inch in 10 feet.

B. Variation in Level for Wall Tile: For horizontal joints and other conspicuous lines, do not exceed 1/4 inch in 20 feet, or 1/2 inch maximum.

C. Variation in Surface Plane of Floor Tile: Do not exceed 1/8 inch in 10 feet from level or slope indicated when tested with a 10 foot straightedge.
D. Variation in Plane Between Adjacent Units (Lipping): Do not exceed the following differences between faces of adjacent units as measured from a straightedge parallel to stone tiled surface:
   1. Units with Polished Faces: 1/64 inch.
   2. Units with Honed Faces: 1/32 inch.
   4. Units with Thermal-Finished Faces: Depth of thermal finish or 3/16 inch, whichever is less.
   5. Units with Natural-Cleft Faces: Depth of natural-cleft finish or 3/16 inch, whichever is less.

E. Variation in Joint Width: Do not vary joint thickness more than 1/16 inch or one-fourth of nominal joint width, whichever is less.

3.8 CLEANING AND PROTECTION

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
   1. Remove grout residue from tile as soon as possible.
   2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation.
      a. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned.
   3. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

C. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

D. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

E. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.9 INTERIOR FLOOR TILE INSTALLATION SCHEDULE

A. Interior Floor Installations: Large format tile, slab-on-grade concrete subfloor.
      a. Tile: ANSI A108.5, porcelain or ceramic.

B. Interior Floor Installations: Standard size tile, slab-on-grade concrete subfloor.
   a. Tile: ANSI A108.5, porcelain or ceramic.

3.10 INTERIOR WALL TILE INSTALLATION SCHEDULE

A. Interior Wall Installations: Standard size tile, non-wet and wet areas except showers.
1. Tile Installation TCNA W244C: Thin-set mortar with liquid-applied waterproof / crack isolation membrane on cementitious backer units.
   a. Wall Type: Wood or metal studs.
   c. Tile: ANSI A108.5, porcelain or ceramic, and ANSI A108.15, glass.

- END OF SECTION -
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section Includes:
1. Acoustical ceiling panels and grid suspension system.
2. Modification and extension of existing exposed grid suspension system in accordance with layout indicated on Drawings. Provide products matching existing.
3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

1.3 RELATED REQUIREMENTS
A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements.”
C. Division 23 Sections - HVAC Work.
D. Division 26 Sections - Electrical Work.

1.4 REFERENCES
C. American Society of Civil Engineers / Structural Engineering Institute (ASCE/SEI):
D. ASTM International:


8. **ASTM E 1264** - Classification for Acoustical Ceiling Products.

### 1.5 DEFINITIONS:

1. **CAC:** Ceiling Attenuation Class.
2. **LR:** Light Reflectance Coefficient.
3. **NRC:** Noise Reduction Coefficient.

### 1.6 SUBMITTALS

A. **Product Data:** For each type of product indicated, demonstrate compliance with specified attributes.

B. **CAL-GREEN Submittals:**
   1. **Product Data – VOC Limits:** For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. **Low / No-VOC Paints and Coatings:** Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

C. **Samples:** For each exposed product and for each color and texture specified, 6 inches (150 mm) in size.

D. **Samples for Initial Selection:** For components with factory-applied color finishes.

E. **Samples for Verification:** For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
   1. **Acoustical Panel:** Set of 6 inch (150 mm) square Samples of each type, color, pattern, and texture.
   2. **Exposed Suspension-System Members, Moldings, and Trim:** Set of 6 inch (150 mm) long Samples of each type, finish, and color.

F. **Informational Submittals**
   1. **Coordination Drawings:** Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
a. Suspended ceiling components.
b. Structural members to which suspension systems will be attached.
c. Size and location of initial access modules for acoustical panels.
d. Items penetrating finished ceiling including the following:
   1) Lighting fixtures.
   2) Air outlets and inlets.
   3) Speakers.
   4) Access panels.
   5) Sprinklers.
e. Perimeter moldings.

2. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.

3. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.

G. Closeout Submittals:
   1. Submit under provisions of Section 01 7700 “Contract Closeout.”
   2. Maintenance Data: For finishes to include in maintenance manuals.

H. Maintenance Materials Submittals
   1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
      b. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.
      c. Seismic Clips: Equal to 2 percent of quantity installed.

1.7 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mockup of each typical ceiling area in location as directed by Architect.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.
1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Services Attached to Suspension Systems: Comply with provisions of ASTM E 580, Section 5.4.1.

C. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
   2. Smoke-Developed Index: 450 or less.

2.2 ACOUSTICAL PANELS, GENERAL

A. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from a single source and from a single manufacturer.

B. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

C. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
   1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL PANELS

A. Acoustical Panel Standard: Provide specified manufacturer's panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances.
   1. Substitutions: Section 01 2500.

B. Acoustical Panels: As indicated on Drawings. Multiple types, sizes and colors may be required.
   1. Size: As indicated on Drawings.
2. Thickness: 1 inch.
3. Core: As indicated on Drawings.
4. Edge: As indicated on Drawings.
5. NRC: 0.95.
6. LR: 0.85.
7. CAC: 22.
8. ASTM E 1264 Classification: Type XX, Pattern E.
9. ASTM E 84 (UL 723) Fire Performance: Class A.
   a. Flame Spread: 0.
   b. Smoke Developed: 0.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

A. Existing Metal Suspension System to remain. Select new and replacement parts to match existing, with the following as Basis of Design.

B. Metal Suspension System Standard: Provide manufacturer’s standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

2. Subject to compliance with requirements, provide named product or an equivalent product by one of following manufacturers:

C. Exposed Suspension System:
1. Grid Materials: Cold-rolled steel with galvanized coating.
3. Color: As selected by Architect

D. Suspension System Accessories:
1. Manufacturer’s standard and special trim and edge moldings to suit suspension system requirements; same finish as suspension system.
2. Provide edge moldings to fit penetrations exactly, including circular penetrations.
3. Provide hold-down clips required for suspended grid system.

E. Attachment Devices:
1. General: Size devices for 5 times loads imposed by complete system.
2. Hanger Wire Form Inserts: No. 6 galvanized wire loop and 26 gauge galvanized shell, or 14 gauge galvanized steel strap with 5/16 inch holes.
3. Hangers:
   a. As recommended by manufacturer and as required to comply with structural classification.
b. Wire Hangers: ASTM A 641, not less than 12 gage, galvanized carbon steel wire, soft temper, pre-stretched.

F. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

2.5 METAL EDGE MOLDINGS AND TRIM

A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: AXIOM® Classic Trim manufactured by Armstrong World Industries, Inc.

1. Type and profile indicated on Drawings, or if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

B. Seismic Restraint Clip at Exposed Grid Perimeter: Provide minimum 7/8 inch molding with ICC-rated seismic rated attachment clip.

2. Chicago Metallic: 1496.

2.6 ACOUSTICAL SEALANT

A. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1. Acoustical Sealant for Exposed and Concealed Joints:
   a. Pecora Corporation; AC-20® FTR Acoustical and Insulation Sealant.
   b. USG Corporation; SHEETROCK® Brand Acoustical Sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
C. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.

2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.

4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

5. When framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.

6. Space hangers not more than 48 inches (1200 mm) on center along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.

7. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

8. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.

B. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system

ACOUSTICAL PANEL CEILINGS
to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.

3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. Arrange directionally patterned acoustical panels as follows:
   a. As indicated on reflected ceiling plans.

2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.

3. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.

4. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.

5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

6. Install impact clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.

7. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Compliance of seismic design.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.

C. Perform the following tests and inspections of completed installations of acoustical panel ceiling hangers and anchors and fasteners in successive stages. Do not proceed with installations of acoustical panel ceiling hangers for the next area until test results for previously completed installations show compliance with requirements.

1. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed.
   a. Within each test area, testing agency will select one of every 10 power-actuated fasteners and postinstalled anchors used to attach hangers to structure and will test them for 200 lbf (890 N) of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf (1957 N) of tension.
b. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.

D. Acoustical panel ceiling hangers and anchors and fasteners will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.5 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

- END OF SECTION -
PART 1 - GENERAL

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

1.2 SUMMARY
   A. Section Includes:
      1. Linoleum sheet flooring.

1.3 RELATED REQUIREMENTS
   A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
   B. Section 01 8113 “Sustainable Design Requirements.”
   C. Pertinent Sections specifying vapor barrier coatings for concrete slabs.
   D. Section 09 0511 “Concrete Floor Preparation.”
   E. Section 09 0512 “Concrete Floor Moisture Content and pH Testing.”
   F. Section 09 6513 “Resilient Flooring Accessories” for resilient wall base and accessories installed with resilient flooring.

1.4 REFERENCES
   D. ASTM International:
4. ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

E. National Fire Protection Association (NFPA):

1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers; documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Product Data – Resilient Flooring: Documentation from an independent testing agency indicating compliance with the FloorScore Standard, or evidence of listing on the RFCl FloorScore database, or evidence of listing on the CHPS Product Registry.

D. Shop Drawings: For each type of resilient flooring.
   1. Include flooring layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
   2. Show details of special patterns.

E. Samples: Minimum 10 inch x 10 inch (254 mm x 254 mm) of each type, color, texture, pattern, and finish of flooring required for Architect’s approval

F. Welded-Seam Samples: For seamless installation technique indicated and for each floor covering product, color, and pattern required; with seam running lengthwise and in center of 6 x 9 inch (150 x 230 mm) sample applied to a rigid backing and prepared by Installer for this Project.

G. Product Schedule: For resilient flooring. Use same designations indicated on Drawings.

H. Qualification Data: For Installer.

I. Sample Warranty: As specified.
J. Closeout Submittals:
1. Submit under provisions of Section 01 7700.
2. Maintenance Data: For each type of resilient flooring to include in maintenance manuals.
3. Warranty: Submit executed warranty.

K. Maintenance Material Submittals:
1. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   a. Resilient Sheet Flooring: Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, in roll form and in full roll width for each type, color, and pattern of flooring installed.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient flooring installation and seaming method indicated.
1. Engage an installer who employs workers for this Project who are trained or certified by flooring manufacturer for installation techniques required.
2. If no training or certification by the flooring manufacturer is available, engage an installer who employs workers for this Project who are competent in techniques required by manufacturer for the flooring installation indicated.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
1. Coordinate mockups in this Section with mockups specified in other Sections.
   a. Size: Minimum 100 sq. ft. (9.3 sq. m) for each type, color, and pattern in locations directed by Architect.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

C. Pre-Installation Conference: Conduct at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

B. Store floor tiles on flat surfaces.

C. Store flooring rolls upright.
1.8 PROJECT CONDITIONS

A. Ambient Temperature Range
   1. Before/During/After Installation:
      a. Except as noted below, maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following periods:
         1) 72 hours before installation.
         2) During installation.
         3) 48 hours after installation.
   2. After Installation
      a. Except as noted below, after installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

B. Close spaces to traffic during floor installation.

C. Close spaces to traffic for 48 hours after floor tile installation.

D. Install floor after other finishing operations, including painting and overhead work, have been completed.

1.9 WARRANTY

A. Manufacturer’s Warranty: Provide Manufacturer’s standard warranty for materials and workmanship.
   1. Warranty Period: Ten (10) years unless otherwise noted.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 LINOLEUM SHEET FLOORING

A. Provide Linoleum sheet flooring products as indicated on Drawings.
   1. Description: ASTM F 2034, homogeneous floor covering made from natural ingredients including linseed oil, rosin binders, wood flour, limestone and dry pigments which are mixed and then calendared onto a natural jute backing.
   3. Gauge: 1/10 inch (2.5 mm).
7. Static Load: 850 lb. per sq. in. per ASTM F 970.
8. Colors and Patterns: As indicated on Drawings.

B. Cove: Provide integral flash coving.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives:
   1. Water-resistant type recommended by flooring and adhesive manufacturers to suit flooring and substrate conditions indicated.

C. Double-Sided Tape: As recommended by flooring manufacturer to suit floor tile and substrate conditions indicated.

D. Seamless-Installation Accessories:
      a. Color: Match floor tile.
   2. Chemical-Bonding Compound: Manufacturer's product for chemically bonding seams.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates and surrounding conditions.

3.2 PREPARATION

A. Prepare substrates as specified in related Sections and according to flooring manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates:
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Tests specified in related Section. Proceed with installation only after substrates pass testing. Installer of this Section may perform additional testing, however, only test results from related Section will be accepted for project records.

4. Moisture/Ph Testing: Tests specified in related Section. Proceed with installation only after substrates pass testing. Installer of this Section may perform additional testing, however, only test results from related Section will be accepted for project records.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor coverings until they are same temperature as space where they are to be installed.
   1. Move floor coverings and installation materials into spaces where they will be installed at least 72 hours in advance of installation.

E. Verify that Moisture Mitigation Control Coating is properly installed.

F. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 RESILIENT SHEET FLOORING INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient sheet flooring.

B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.

C. Lay out resilient sheet flooring as follows:
   1. Maintain uniformity of flooring direction.
   2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in flooring substrates.
   3. Match edges of flooring for color shading at seams.
   4. Avoid cross seams.

D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.

H. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
I. Integral-Flash-Cove Base: Cove resilient sheet flooring to dimension indicated up vertical surfaces. Support flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.

J. Seamless Installation:
1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to fuse sections permanently into a seamless flooring installation. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.
2. Resilient Flooring Transitions to Other Flooring: Use heat-welded or chemically bonded seams where resilient floor product abuts another resilient flooring product.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer’s written instructions for cleaning and protecting resilient flooring.

B. Perform the following operations immediately after completing resilient flooring installation:
1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover and protect resilient flooring until date of Substantial Completion.

- END OF SECTION -
- SECTION 09 6513 -

RESILIENT FLOOR ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Resilient base.
   2. Resilient molding accessories.
   3. Resilient stair accessories.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 09 6500 "Resilient Flooring."

D. Section 09 6813 "Tile Carpeting."

1.4 REFERENCES


D. ASTM International:

E. National Fire Protection Association (NFPA):

1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

C. CAL-GREEN Submittals:
1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers; documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
2. Product Data – Resilient Flooring: Documentation from an independent testing agency indicating compliance with the FloorScore Standard, or evidence of listing on the RFCI FloorScore database, or evidence of listing on the CHPS Product Registry.

D. Samples: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches (300 mm) long, of each resilient product color, texture, and pattern required.

E. Product Schedule: For resilient products. Use same designations indicated on Drawings.

F. Qualification Data: For Installer.

G. Sample Warranty: As specified.

H. Closeout Submittals:
1. Submit under provisions of Section 01 7700.
2. Maintenance Data: For each type of resilient product to include in maintenance manuals.
3. Warranty: Submit executed warranty.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Resilient Floor Accessories: Equal to 3 percent of amount installed for each type of resilient floor accessory indicated.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient product installation.
B. Pre-Installation Conference: Conduct at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.9 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:
   1. 72 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Install resilient products after other finishing operations, including painting, have been completed.

1.10 WARRANTY

A. Manufacturer’s Warranty: Provide Manufacturer’s standard warranty for materials and workmanship.
   1. Warranty Period: Ten (10) years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

C. ASTM D 2047 Slip-Resistance: Provide resilient flooring products that meet or exceed Federal ADA recommendations of minimum Coefficient of Friction of 0.6 for flat surfaces and 0.8 for sloped surfaces.

2.2 RESILIENT BASE

A. Basis of Design: BurkeBase® Thermoset Rubber Wall Base manufactured by Burke Flooring; tel: (800) 447-8442; web: www.burkeflooring.com.
B. Subject to compliance with requirements, provide named product or an equivalent product by one of the following manufacturers:
   1. Armstrong World Industries, Inc.
   2. Burke Flooring.
   3. Flexco, Inc.
   5. Roppe Corporation, USA.

C. Resilient Base Standard: ASTM F 1861, Type TS, Group I.

D. Description:
   1. Composition: Vulcanized thermoset rubber.
   2. Minimum Thickness: 0.125 inch (3.2 mm).
   3. Lengths: Coils in manufacturer's standard length.
   5. Inside Corners: Job formed or preformed.
   6. Colors: As selected by Architect from manufacturer's full range of options.

E. Wall Base at Carpet: Standard Profile, Toeless.
   1. Height: 4 inches.

F. Wall Base at Resilient Flooring: Standard Profile, Coved.
   1. Height: 4 inches.
   2. Provide at locations where resilient flooring is not self-coved.

2.3 RESILIENT MOLDING ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Armstrong World Industries, Inc.
   2. Burke Flooring Products.
   3. Flexco, Inc.
   5. Roppe Corporation, USA.

B. Description: Reducer strip for resilient floor covering and transition strips.
   1. Composition: Rubber.
   2. Colors: As selected by Architect from manufacturer's full range of options.

C. Profiles and Dimensions: As shown on the Drawings, if not shown, provide profiles required to provide wheelchair-accessible transitions meeting applicable codes between flooring finishes indicated.

2.4 INSTALLATION MATERIALS

A. Trowelable Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates and surrounding conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until they are same temperature as the space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 72 hours in advance of installation.

D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer’s written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. Preformed Corners: Install preformed corners before installing straight pieces.
G. Job-Formed Corners:
   1. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories:
   1. Butt to adjacent materials and tightly adhere to substrates throughout length of each piece.
   2. Install reducer strips at edges of resilient floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:
   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-wipe surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products for protection until date of Substantial Completion.

- END OF SECTION -
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section Includes:
   1. Textile composite tiles, adhered.

1.3 RELATED REQUIREMENTS
A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements.”
C. Pertinent Sections specifying vapor barrier coatings for concrete slabs.
D. Section 09 0511 “Concrete Floor Preparation.”
E. Section 09 0512 “Concrete Floor Moisture Content and pH Testing.”
F. Section 09 6513 “Resilient Flooring Accessories” for resilient wall base and accessories installed with carpet.

1.4 REFERENCES
D. American Association of Textile Chemists and Colorists (AATCC):
   1. AATCC 134 - Electrostatic Propensity of Carpets.
E. ASTM International:

F. Carpet and Rug Institute (CRI):
   1. CRI 104 – Standard for Installation of Commercial Carpet.

G. National Fire Protection Association (NFPA):

1.5 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Submit written data on physical characteristics, durability, resistance to fading and flame resistance characteristics.

B. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers; documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
   2. Low Emitting Carpet: Provide certification that all carpet is certified CRI Green Label Plus. Refer to Section 01 6116.

C. Shop Drawings: Show the following:
   1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
   2. Carpet tile type, color, and dye lot.
   3. Type of subfloor.
   4. Type of installation.
   5. Pattern of installation.
   6. Pattern type, location, and direction.
   7. Pile direction.
   8. Type, color, and location of edge, transition, and other accessory strips.
   9. Transition details to other flooring materials.

D. Samples for verification purposes in manufacturer's standard size, showing full range of color, texture, and pattern variations expected. Prepare samples from same material to be used for the Work. Submit the following:
   1. 24-inch square samples of each type of flooring material required.
   2. 12-inch long samples of each type exposed edge stripping and accessory item.

E. Submit CRI Green Label Plus certification number.

F. Qualification Data: For Installer.

G. Sample Warranty: As specified.
H. Closeout Submittals:
1. Submit under provisions of Section 01 7700.
2. Maintenance Data: For tile carpeting to include in maintenance manual.
3. Warranty: Submit executed warranty.

1.6 QUALITY ASSURANCE
A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for flooring installation indicated.
B. Pre-Installation Conference: Conduct at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.
B. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, blocked off ground. Maintain minimum temperature of 68-degrees F at least three-days prior to and during installation in area where materials are stored.

1.8 PROJECT CONDITIONS
A. Environmental Limitations: Do not deliver or install flooring until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.9 WARRANTY
A. Special Carpet Warranty: Written warranty, signed by carpet manufacturer and Contractor agreeing to replace carpet that does not comply with requirements or that fails within specified warranty period. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse. Failures include, but are not limited to, more than 10-percent loss of face fiber, edge raveling, snags, runs (wet or dry conditions) and delamination in normal use.
1. Warranty Period: Limited Lifetime.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.
B. Carpet: Comply with Title 24, Part 11, 5.504.4.4; meet testing and product requirements of one of the following:
1. Carpet & Rug Institute “Green Label Plus”.
2. California Department of Public Health Standard Practice for testing of VOC’s (Specification 01350).
3. NSF/ANSI 140 at Gold Level.
5. All carpet cushion installed to meet requirements of Carpet & Rug Institute “Green Label Program.”
6. All carpet cushion installed to meet requirements of Title 24, Part 11, Table 5.504.4.1.

C. Pile Height: 1/2 inch maximum.

D. Critical Radiant Flux (CRF): Class I, minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.

E. Dimensional Tolerance: Within 1/32 inch (0.8 mm) of specified size dimensions, as determined by physical measurement.

F. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

2.2 MANUFACTURERS

2.3 CARPET TILES

A. Carpet Tile: Products as indicated on the Drawings. Multiple types, patterns, colors and styles are required.
   1. Size: As indicated on Drawings.
   2. Color: As indicated on Drawings.
   5. Gauge: 1/10 inch.
   7. Total Thickness: 0.345 inch.
   8. Average Density: 8409 per cu. yd.
   10. Fiber System: Manufacturer’s standard type.
   11. Primary Backing: Synthetic.

2.4 ACCESSORIES

A. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

B. Leveling and Patching Compounds: As recommended by flooring manufacturer.
C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting floor covering performance. Examine floor covering for type, color, pattern, and potential defects.

B. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.

C. Verify preparatory work by other trades is complete.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates and surrounding conditions.

3.2 PREPARATION

A. Prepare substrates as specified in related Sections and the following:
   1. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface. Repair damage to Moisture Mitigation Control Coating where occurs and re-test for adhesion.
   2. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm), unless more stringent requirements are required by manufacturer's written instructions.

B. Broom and vacuum clean substrates to be covered immediately before installing floor covering.

3.3 INSTALLATION

A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.

B. Install carpet tiles in pattern as indicated on Drawings.

C. Maintain dye lot integrity. Do not mix dye lots in the same area.

D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

G. Install pattern parallel to walls and borders.

H. Provide cutouts where required, and bind cut edges where not concealed.

I. Fit sections of carpet prior to application of adhesive.

J. Apply adhesive uniformly to substrate in accordance with manufacturer's instructions. Butt edges tight to form seams without gaps. Roll entire area lightly to eliminate air pockets and ensure uniform bond.

3.4 CLEANING

A. Remove adhesive from carpet surface with manufacturer's recommended cleaning agent.


3.5 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to Architect, to ensure carpet is not damaged or deteriorated at time of Substantial Completion.

- END OF SECTION -
- SECTION 09 8100 -

ACOUSTICAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Acoustical batt insulation.
   2. Acoustical board insulation.
   3. Auxiliary materials.
   4. Fasteners.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 07 2100 “Thermal Insulation.”

D. Section 09 2216 “Non-Structural Metal Framing” for partition framing receiving acoustical insulation.

1.4 REFERENCES


C. ASTM International:

D. Underwriters Laboratories Inc. (UL):
   1. UL (FRD) - Fire Resistance Directory.

E. Manufacturer's recommendations and specifications.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

B. CAL-Green Submittals:
   1. Formaldehyde Limits: Provide certification that all products meet current CARB Airborne Toxic Control Measure (ATCM) for Formaldehyde Limits by Mandatory Compliance Dates as specified in Section 01 6116 “Volatile Organic Compound (VOC) Restrictions”.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on tests performed by qualified independent testing laboratory evidencing compliance of fire performance characteristics, and other properties, based on comprehensive testing of current products.

B. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.

1.7 QUALITY ASSURANCE

A. Pre-Installation Conference: Conduct at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer’s recommendations for handling, storage, and protection during installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Fire Performance Characteristics: Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per the ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having
jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.


2.2 ACOUSTICAL BATT INSULATION


1. Thickness: 4 inch or 6 inch thick, refer to Drawings.
2. Width: 16 inches minimum.
3. Surface Burning Characteristics:
   b. Smoke Developed: ≤ 50.

B. Subject to compliance with requirements, provide named product or an equivalent product by one of the following manufacturers:


2.4 AUXILIARY MATERIALS

A. Wire and Insulation Supports: As manufactured by E-Z Wire Products or as recommended by insulation manufacturer.

B. Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.

1. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 -inch (2.67 mm) in diameter; length to suit depth of insulation indicated.
   a. Where spindles will be exposed to human contact after installation, protect ends with capped self-locking washers.
2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 -inch (0.762 mm) thick by 2 -inches (50 mm) square.
3. Acceptable Manufacturers:
   a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
   b. Gemco; Spindle Type.
   c. Substitutions: Section 01 2500.
PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates and conditions with Installer present, for compliance with requirements of the Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates and surrounding conditions.

3.2 PREPARATION
A. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.

3.3 INSTALLATION, GENERAL
A. Comply with insulation manufacturer's instructions applicable to products and application indicated.

B. Extend insulation full thickness as indicated to envelop entire area to be acoustically insulated.
   1. Cut and fit tightly around obstructions.

C. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

D. Provide sizes (widths and thicknesses) to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths.
   1. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.
   2. Install full lengths whenever possible to fill entire length of wall cavity.

E. Install acoustical insulation batts in stud partition walls as indicated on Drawings. Install batts prior to installing gypsum panels unless batts are readily installed after panels have been installed on one side.

F. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation.

3.4 INSTALLATION OF ACOUSTICAL INSULATION AT WALLS
A. Apply insulation units to substrate by method indicated, complying with manufacturer's written recommendations.
   1. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
   2. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
3. Maintain 3 inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs

3.5 INSTALLATION OF ACOUSTICAL INSULATION AT CEILINGS

A. General: Install, unfaced glass-fiber blanket insulation over suspended ceilings.
   1. At partitions that are not full-height to floor or ceiling framing, center insulation bats over partition and extend 48 inches minimum beyond partition.

B. Linear Wood Plank Ceiling: Install acoustical insulation board.
   1. Fasten acoustical insulation boards with spindles and plates as recommended by board manufacturer and as detailed on Drawings.

3.6 PROTECTION

A. General: Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

3.7 INSULATION SCHEDULE

A. Interior Partitions: Install acoustical insulation batts full height of partition framing as noted on Drawings.

B. Ceiling Systems: As indicated on Drawings.

C. All other locations as indicated on Drawings, and as required to complete an acoustical barrier between two adjacent spaces as indicated.

- END OF SECTION -
- SECTION 09 8400 -

ACOUSTIC COMPONENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Shop-fabricated sound-absorbing wall panels.

B. Work Specified in Other Sections to be Provided by This Section:
   1. Wall panel fabric specified in Section 09 7200 “Wall Coverings.”

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 09 2216 “Non-Structural Metal Framing” for miscellaneous blocking and backing in walls.

D. Section 09 2900 “Gypsum Board” for preparation of wall finish to receive acoustic components.

1.4 REFERENCES


C. ASTM International:
1.5 DEFINITIONS
A. NRC: Noise Reduction Coefficient.
B. STC: Sound Transmission Coefficient.

1.6 SUBMITTALS
A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.
B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include each type of fabric facing, panel edge, core material, and mounting system.
C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
D. Shop Drawings: For sound-absorbing wall units. Include mounting devices details.
   1. Details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections.
   2. Indicate panel edge and core materials.
   3. Include elevations showing panel sizes and direction of fabric weave and pattern matching.
E. Samples: For the following products, prepared on Samples of size indicated below.
   1. Fabric: Full-width by approximately 36 inch (900 mm) long Sample, but not smaller than required to show complete pattern repeat, from dye lot to be used for the Work, and with specified treatments applied. Mark top and face of fabric.
   2. Panel Edge: 12-inch (300 mm) long Sample(s) showing each edge profile, corner, and finish.
   3. Core Material: 12 inch (300 mm) square Sample at corner.
   5. Assembled Panels: Approximately 36 by 36 inches (900 by 900 mm), including joints and mounting methods.
F. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Electrical outlets, switches, and thermostats.
   2. Items penetrating or covered by sound-absorbing wall units including the following:
      a. Lighting fixtures.
      b. Air outlets and inlets.
      c. Speakers.
      d. Alarms.
      e. Sprinklers.
      f. Access panels.
3. Show operation of hinged and sliding components covered by or adjacent to sound-absorbing wall units.

G. Product Certificates: For each type of sound-absorbing wall unit, from manufacturer.

H. Qualification Data: For Fabricator and Installer.

I. Sample Warranty: As specified.

J. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.
   2. Maintenance Data: For sound-absorbing wall units to include in maintenance manual. Include fabric manufacturers’ written cleaning and stain-removal recommendations.
   3. Warranty: Submit executed warranty.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials from same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Fabric: For each fabric, color, and pattern installed, provide length equal to 10 percent of amount installed, but no fewer than 10 yards (9 m).
   2. Mounting Devices: Full-size units equal to 5 percent of amount installed, but no fewer than five devices, including unopened adhesives.

1.8 QUALITY ASSURANCE


C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials, fabrication, and installation.
   1. Build mockup of typical wall area as directed by Architect. Include intersection of wall and ceiling, corners, and perimeters.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

D. Pre-Installation Conference: Conduct conference at Project site.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent Division 01 Sections specifying product handling requirements.

B. Comply with fabric and sound-absorbing panel manufacturers’ written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
C. Deliver materials and units in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not install sound-absorbing wall units until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Lighting: Do not install sound-absorbing wall units until a permanent level of lighting is provided on surfaces to receive the units.

C. Air-Quality Limitations: Protect sound-absorbing wall units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.

D. Field Measurements: Verify locations of sound-absorbing wall units and actual dimensions of openings and penetrations by field measurements before fabrication.

1.11 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard limited warranty against defects in materials or workmanship within specified warranty period.

1. Defects include, but are not limited to the following:

   a. Fabric sagging, distorting, or releasing from panel edge.

   b. Warping of core.

2. Warranty Period: Three (3) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers and coatings. Comply with limits specified in Section 01 6116.

B. Fire-Test-Response Characteristics: Provide sound-absorbing wall units meeting the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

   1. Surface-Burning Characteristics: As determined by testing per ASTM E 84.

      a. Flame-Spread Index: 25 or less.

      b. Smoke-Developed Index: 450 or less.

C. Acoustical Performance: Values for panels as specified and in accordance with ASTM C 423 testing method.
2.2 SOUND-ABSORBING WALL PANELS


1. Construction: Panel consists of a 6 to 7 pcf (96 to 112 kg/m³) core with a 1/8 inch (3mm) thick 16 to 20 pcf (256 to 320 kg/m³) high density acoustically transparent face. Fabric corners are fully tailored (no exposed darting).

2. Thickness: As indicated on Drawings.

3. Panel Sizes: Custom sizes as indicated on Drawings.

4. Edge Profile: As indicated on Drawings.

5. Mounting: Z-clip plates and wall bars as detailed on Drawings.

6. Surface Burning Characteristics: Class I/A per ASTM E 84.

7. Acoustic Performance: NRC 0.70 minimum.

2.3 FACING MATERIAL

A. Acoustical Panel Fabric: Brushed Flannel manufactured by Designtex.

1. Fabric Content: 100% Polyester.

2. Colors: As indicated on Drawings, or as selected by Architect if none are indicated.


4. Weight: 12.5 oz. per linear yard.

5. Category per ASTM F 793: V, Type II, Commercial Serviceability.

2.4 FABRICATION

A. General: Use manufacturer's standard construction except as otherwise indicated; with facing material applied to face, edges, and back border of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.


B. Facing Material: Apply fabric facing fully covering visible surfaces of unit; with material stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other visible distortions or foreign matter.


2. Radius and Other Nonsquare Corners: Attach facing material so there are no seams or gathering of material.

3. Fabrics with Directional or Repeating Patterns or Directional Weave: Mark fabric top and attach fabric in same direction so pattern or weave matches in adjacent units.

C. Dimensional Tolerances of Finished Units: Plus or minus 1/16 inch (1.6 mm) for the following:

1. Thickness.

2. Edge straightness.

3. Overall length and width.

4. Squareness from corner to corner.

5. Chords, radii, and diameters.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fabric, fabricated units, substrates, areas, and conditions, for compliance with requirements, installation tolerances, and other conditions affecting performance of sound-absorbing wall units.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 INSTALLATION

A. Install sound-absorbing wall units in locations indicated with vertical surfaces and edges plumb, top edges level and in alignment with other units, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.

B. Comply with sound-absorbing wall unit manufacturer’s written instructions for installation of units using type of mounting devices indicated. Mount units securely to supporting substrate.

C. Align and level fabric pattern and grain among adjacent units.

3.3 INSTALLATION TOLERANCES

A. Variation from Plumb and Level: Plus or minus 1/16 inch (1.6 mm).

B. Variation of Panel Joints from Hairline: Not more than 1/16 inch (1.6 mm) wide.

3.4 CLEANING

A. Clip loose threads; remove pills and extraneous materials.

B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer’s written instructions.

- END OF SECTION -
- SECTION 09 9123 -

INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following interior substrates:
   1. Wood.
   2. Gypsum board.
   3. Steel.
   5. Aluminum (not anodized or otherwise coated).
   6. Concrete.
   7. Concrete masonry units (CMU).

B. Surface preparation of new surfaces, priming, and finish coats specified in this Section are in addition to prepping, shop priming and surface treatment specified in other Sections.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.

D. Division 06 Sections for shop priming carpentry with primers specified in this Section.

E. Section 09 2900 “Gypsum Board” for Level 5 Finish Primer/Prep Coat applied to surface of Gypsum Board to provide a smooth finish.

F. Section 09 9600 “High Performance Coatings” for scuff-resistant coating on wood doors and gypsum board walls requiring repetitive washing and scrubbing.
1.4 REFERENCES


C. ASTM International:

D. Master Painters Institute (MPI):

1. Shop, Field, and Maintenance Painting of Steel (SSPC-PA 1).
2. Hand Tool Cleaning (SSPC-SP 2).
3. Power Tool Cleaning (SSPC-SP 3).

1.5 DEFINITIONS

A. Paint Gloss Levels: Per ASTM D 523.
1. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees.
2. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees.
3. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees.
4. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees.
5. Gloss Level 5: 35 to 70 units at 60 degrees.
6. Gloss Level 6: 70 to 85 units at 60 degrees.
7. Gloss Level 7: More than 85 units at 60 degrees.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
1. Include preparation requirements and application instructions.

B. CAL-GREEN Submittals:
1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.
2. Low / No-VOC Paints and Coatings: Provide certification that all primers and coatings meet VOC emission limits specified in Section 01 6116. List manufacturer, brand, application, type (flat or non-flat), and the VOC emissions per gallon in terms of grams/liter. Include MSDS and product data sheet indicating VOC limits for each product provided.

C. Samples: For each type of paint system and in each color and gloss of topcoat.
1. Submit Samples on actual material being painted, for each color, on material sample sizes as noted in individual material Sections, or if not noted, minimum 8 inches square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:
1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. VOC content.

E. Closeout Submittals:
1. Submit under provisions of Section 01 7700.
2. At completion of work of this Section, submit manufacturer's or distributor's numbered invoices showing type and quantity of products used on this Project.
3. Coating Maintenance Manual: Upon conclusion of the project, the contractor and paint manufacturer/supplier for each paint manufacturer used will furnish a Coating Maintenance Manual.
   a. Manual to include the following:
      1) Area Summary with Finish Schedule.
      2) Area Detail designating where each product, color and finish was used.
      3) Product Data pages.
      4) Material Safety Data Sheets (MSDS).
      5) Care and Cleaning instructions.
      6) Touch-up procedures.
      7) Color samples of each color and finish used.

F. Maintenance Material Submittals:
1. Furnish extra materials, from the same product run that match products installed and that are in original containers for storage, identified with labels describing contents and room locations.
   a. Paint: Provide 1 gal. (3.8 L) of each material and color applied.
      1) Provide two copies of the mixing formula to the Architect in addition to the instructions attached to paint containers.

1.7 QUALITY ASSURANCE

A. MPI Standards: Preparation and Workmanship; Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated for new construction and re-finished surfaces.

B. Source Limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.

C. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
   1. Notify Architect of problems anticipated using the materials specified.
1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 degrees F (7 degrees C).
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 degrees F (10 and 35 degrees C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F (3 degrees C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS

A. Basis of Design Manufacturer: Products specified in this Section are manufactured by Dunn-Edwards Paints; tel: (888) 337 2468; web: www.dunnedwards.com.

B. Subject to compliance with requirements, provide named products or equivalent products by one of the following manufacturers. Architect’s color selections will be matched as closely as possible.
   2. Glidden Professional (previously ICI Paints); tel: (800) 984-5444; web: www.glidden.com.
   6. Substitutions: Section 01 2500.

2.3 PAINT MATERIALS, GENERAL

A. Material Compatibility:
   1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
   2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
   3. Fire Retardant Paint: For each material or coat, provide products and spreading rates recommended in writing by intumescent paint manufacturer for use on substrate indicated.
Comply with requirements for fire-retardant coating classification and surface-burning characteristics indicated.

B. VOC Content: Provide products that comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24). Comply with CBC 2010 – Part 11 “CAL-Green” Table 5.504.4.3.

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 100 g/L.
3. Nonflat High Gloss Coatings: 150 g/L.
4. Dry-Fog Coatings: 150 g/L.
5. Primers, Sealers, and Undercoaters: 100 g/L.
6. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
8. Pretreatment Wash Primers: 420 g/L.
9. Floor Coatings: 100 g/L.

2.4 PAINT COLORS

A. Paint Colors: Refer to Drawings for color selections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.

B. Maximum Moisture Content of Substrates: Per MPI Architectural Painting Specification Manual when measured with an electronic moisture meter as follows.

1. Concrete: 12 percent.
3. Wood: 15 percent.
4. Gypsum Board: 12 percent.
5. Plaster: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

E. Proceed with coating application only after unsatisfactory conditions have been corrected. Application of coating indicates acceptance of surfaces and conditions.
3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in MPI Manuals applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer, but not less than the following.
   1. SSPC-SP 2 (Hand Tool Cleaning).
   2. SSPC-SP 3 (Power Tool Cleaning).

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
   1. Clean all galvanized metal with an appropriate Metal Preparation & Passivator Remover.
   2. To ensure passivators removal, perform the following test:
      a. With a 5 percent copper sulfate solution, place a swab or droplets on the prepared area. If the copper sulfate causes the galvanized surface to blacken, passivator has been removed and is ready for paint applications.
      b. If the copper sulfate has no effect on the galvanized surface, continue with metal preparation solution or use a Scotch Pad to abrade it, being careful not to remove the galvanization itself.
      c. Process to be documented on behalf of Owner.
I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:
1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood. Allow primer to fully cure for 24 hours before applying finish coats.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

A. Apply paints according to manufacturer’s written instructions and to recommendations in MPI Manuals.
1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
1. Pigmented Finishes: If undercoats or other conditions show through pigmented topcoat/overcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed in equipment rooms:
   a. Equipment, including panelboards.
   b. Uninsulated metal piping.
   c. Uninsulated plastic piping.
   d. Pipe hangers and supports.
   e. Metal conduit.
   f. Plastic conduit.
   g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
2. Paint the following work where exposed in occupied spaces:
   a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
h. Other items as directed by Architect.

3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing (DFT): Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
   1. Contractor shall touch up and restore painted surfaces damaged by testing.
   2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINT SCHEDULE

A. General: As indicated in Schedule on Drawings.

B. Plaster and Gypsum Wallboard Walls (Eggshell), Unless Otherwise Noted:
   1. Eggshell Acrylic-"Low VOC" Finish (Gloss Level 3): Two finish coats over a primer.
      a. Primer Coat * (1.4 mils DFT):
         1) ULTRA-GRIP Premium, Acrylic Multi-Purpose Primer (UGPR00 Series).
      b. Intermediate Coat (1.5 mils DFT):
         1) EVEREST® EVER30 Low VOC Eggshell.
      c. Final Coat (1.5 mils DFT):

1) **EVEREST® EVER30 Low VOC Eggshell.**

* Surfaces that were prepared to a Level 5 Finish, using the Level 5 Primer/Prep Coat (as specified in Section 09 2900 “Gypsum Board may omit primer coat noted above. Verify with paint manufacturer that this primer is compatible with the finish coats as specified.

C. **Plaster and Gypsum Wallboard Walls (Semi-Gloss), Unless Otherwise Noted:**
   1. **Semi-Gloss Acrylic-Enamel Finish (Gloss Level 5):** Two finish coats over a primer.
      a. **Primer Coat * (1.4 mils DFT):**
         1) **ULTRA-GRIP Premium, Acrylic Multi-Purpose Primer (UGPR00 Series).**
      b. **Intermediate Coat (1.5 mils DFT):**
         1) **EVEREST® EVER50 Low VOC Semi-Gloss.**
      c. **Final Coat (1.5 mils DFT):**
         1) **EVEREST® EVER50 Low VOC Semi-Gloss.**

D. **Gypsum Wallboard Walls Requiring Repetitive Washing and Scrubbing:** Refer to Section 09 9600 “High Performance Coatings.”

E. **Wood Substrates, Unless Otherwise Noted:** Including wood trim and plywood backboards (Semi-Gloss):
   1. **Semi-Gloss Acrylic-Latex System Finish (Gloss Level 5):** Two finish coats over a primer.
      a. **Primer Coat * (1.4 mils DFT):**
         1) **ULTRA-GRIP Premium, Acrylic Multi-Purpose Primer (UGPR00 Series).**
      b. **Intermediate Coat (1.5 mils DFT):**
         1) **EVEREST® EVER50 Low VOC Semi-Gloss.**
      c. **Final Coat (1.5 mils DFT):**
         1) **EVEREST® EVER50 Low VOC Semi-Gloss.**

F. **Wood Doors:** Refer to Section 09 9600 “High Performance Coatings.”

G. **Metal Surfaces: Non-Ferrous Metals and Zinc-Coated (Galvanized) Steel.**
   1. **Semi-Gloss Urethane Alkyd Enamel Finish (Gloss Level 6):** Two finish coats over a primer.
      a. **Primer Coat (2.0 mils DFT):**
         1) **ULTRASHIELD® Interior/Exterior Galvanized Metal Primer (ULGM00).**
      b. **Intermediate Coat (1.5 mils DFT):**
         1) **ARISTOSHIELD™ Interior/Exterior Semi-Gloss Paint (ASHL50).**
      c. **Final Coat (1.5 mils DFT):**
         1) **ARISTOSHIELD™ Interior/Exterior Semi-Gloss Paint (ASHL50).**

H. **Metal Surfaces: Non-Ferrous Metals and Zinc-Coated (Galvanized) Steel.**
   1. **Eggshell Urethane Alkyd Enamel Finish (Gloss Level 3):** Two finish coats over a primer.
      a. **Primer Coat (2.0 mils DFT):**
         1) **ULTRASHIELD® Interior/Exterior Galvanized Metal Primer (ULGM00).**
      b. **Intermediate Coat (1.5 mils DFT):**
         1) **ARISTOSHIELD™ Interior/Exterior Eggshell Paint (ASHL30).**
      c. **Final Coat (1.5 mils DFT):**
1) ARISTOSHIELD™ Interior/Exterior Eggshell Paint (ASHL30).

I. Metal Surfaces: Ferrous Metals- Uncoated:
   1. Gloss Acrylic-Enamel Finish (Gloss Level 6): Two finish coats over a primer.
   a. Primer Coat (3.0 mils DFT):
      1) BLOC-RUST Premium, Rust-Preventative Metal Primer.
   b. Intermediate Coat (1.5 mils DFT):
      1) ARISTOSHIELD™ Interior/Exterior High Gloss Paint (ASHL70).
   c. Final Coat (1.5 mils DFT):
      1) ARISTOSHIELD™ Interior/Exterior High Gloss Paint (ASHL70).

J. Concrete Masonry Unit (CMU) Walls:
   1. Gloss Acrylic-Enamel Finish (Gloss Level 6): Two finish coats over a block filler.
   a. Primer Coat (8.0 mils DFT):
      1) Smooth BLOCFIL Premium, Interior/Exterior Concrete Block Filler (SBPR00).
   b. Intermediate Coat (1.5 mils DFT):
      1) EVERSHEL, Interior / Exterior 100% Acrylic Gloss Paint (EVSH60).
   c. Final Coats (1.5 mils DFT):
      1) EVERSHEL, Interior / Exterior 100% Acrylic Gloss Paint (EVSH60).

K. Concrete Walls:
   1. Gloss Acrylic-Enamel Finish (Gloss Level 6): Two finish coats over a primer.
   a. Primer Coat (2.0 mils DFT):
      1) EFF-STOP® PREMIUM Interior/Exterior Primer/Sealer (ESPR00).
   b. Intermediate Coat (1.5 mils DFT):
      1) EVERSHEL, Interior / Exterior 100% Acrylic Gloss Paint (EVSH60).
   c. Final Coats (1.5 mils DFT):
      1) EVERSHEL, Interior / Exterior 100% Acrylic Gloss Paint (EVSH60).

-END OF SECTION-
## DIVISION 10 – SPECIALTIES

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- SECTION 10 1400 -

SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Room identification.
   2. Accessibility signage.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 09 2216 “Non-Structural Metal Framing” for backing to support signage at metal framing.

1.4 REFERENCES


D. ASTM International:
   2. ASTM D 4802 - Standard Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet

E. International Code Council (ICC):
1.5 DEFINITIONS


1.6 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Manufacturer’s standard construction details, including materials, dimensions of individual components, profiles, and finishes for each type of sign required. Provide manufacturer’s recommendations for maintenance and cleaning requirements for interior sign surfaces.

B. CAL-GREEN Submittals: Product Data – VOC Limits: For adhesives, sealants, fillers, coatings and primers, documentation including printed statement of VOC contents, comply with limits specified in related section.

C. Shop Drawings: Submit for each type of sign. Include the following:
   1. Signage Plan: Contractor-generated building plans showing the locations of signs. The exact final locations of signs shall be directed by the Owner and as required by code. Contractor shall arrange for meeting at the Project site to accommodate the Owner’s direction of final locations.
      a. Use same sign designations in submittals as indicated on Contractor’s Sign Types Drawing.
   2. Sign Elevations.
   3. Details of fabrication, attachment and erection.
   4. Include materials, shapes, dimensions, finishes, anchorage, and method of connections.
   5. Show letter spacing and dimensions of letter heights.
   6. Anchors, accessories, layout, and installation details.
   7. Submit message list for each sign to be provided, including large-scale details of wording and layout of lettering.
   8. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.

D. Samples: Provide three sets, nonreturnable, of the following samples of each sign type for verification of compliance with requirements indicated.
   1. Material Samples: For verification of color, pattern, and texture selected, and compliance with requirements indicated.
      a. Acrylic Sheet: Provide a sample panel not less than 8-1/2-inches by 11-inches with a representative sample of graphic image required, showing graphic style, and colors and finishes of letters, numbers, and other graphic devices.
      b. Magnesium: Samples of each finish type and color, not less than 4-inch squares of sheet or plate.
      c. Vinyl Film: Samples of each decal type, not less than 4-inches square.
   2. Submit full-size patterns of each sign type with solid black letterforms and graphic elements of a white background with sign face outlined. Typography must be represented in exact typeface and letter spacing specified either as film positives to photocopies...
produced from camera-ready artwork or typesetting or as pen plots when computer-cut lettering is specified. Graphic elements must be represented either by film positives or photocopies produced from camera-ready artwork.

3. Submit non-returnable samples of each lettering type, finish, color and exposed material to be used in the Work.

E. Qualification Data:
   1. For fabricator and installer.

F. Operations and Maintenance Data: Submit instructions for maintenance tasks, including cleaning and repair, within the capabilities of Owner’s maintenance staff.

G. Warranty: Special warranty specified in this Section.

1.7 QUALITY ASSURANCE

A. Installer’s Qualifications: Installer shall be either the fabricator or a firm approved by the fabricator which specializes in installation of interior signage, having a minimum of 5 years full time experience installing signage of similar scope and complexity.

B. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

1.8 DELIVERY, STORAGE AND HANDLING

A. Comply with requirements of Section 01 6000.

1.9 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers’ written instructions and warranty requirements.

1.10 PROJECT COORDINATION

A. Meet with Owner and confirm in writing all room numbers, copy and layout, and sign quantities prior to production.

1.11 WARRANTY

A. Signing Warranty:
   1. Submit a 5 year written warranty, effective the date of Completion of the Work, signed by the sign subcontractor and installer, agreeing to repair or replace work at no cost to the Client that has failed as a result of defects in materials or workmanship or installation. Upon notification of such defects, within the warranty period, make necessary repairs or replacement at the convenience of the Client or client’s design consultant.

B. Polyurethane Acrylic Paint Factory Finish Warranty:
1. Submit a 5 year written warranty, warranting that the factory-applied linear polyurethane finishes will not develop excessive fading or excessive non-uniformity of color or shade, and will not crack, peel, pit, corrode or otherwise fail as a result of defects in materials or workmanship within the following defined limits. Upon notification of such defects, within the warranty period, make necessary repairs or replacement at no cost to the Client at the convenience and approval of the Client or client’s design consultant.

C. The Sign Fabricator shall strictly adhere to the fabrication and application specifications of all applied materials of manufacturer to ensure the full five (5) year contractual warranty and the full five (5) year manufacturer warranty.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in related section.

B. Regulatory Requirements: Comply with applicable provisions in the following:
   4. In case of conflict, follow the more stringent requirements.

2.2 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Products described below and identified by product name, model number, or other manufacturer designation, are Basis of Design Products. Basis of Design Products establish the standards of type, function, dimension, in-service performance, physical properties, appearance, warranty, cost, and other characteristics required by the Project. The Project’s design is based on the Basis-of-Design Products specified.
   2. Substitutions: As approved by Architect in writing.
      a. The burden of proof of equality of proposed products is on the Contractor.
   3. If “No Substitutions” is indicated next to the product name, provide only products of listed manufacturers.

2.3 SIGN MATERIALS

A. Cast Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

B. Colored Coatings for Acrylic Plastic Sheet: As recommended by acrylic manufacturers, including inks and paints for copy and background colors, for optimum adherence to acrylic surface and that are non-fading for application indented.
2.4 ACRYLIC PLACA SIGNS

A. Acrylic Signage: Signs complying with requirements of CBC Section 1127A.7 and Section 1143A.

B. Acceptable Manufacturers:

C. Toilet Room Door Signage: Shop fabricated signs with pictograms as indicated on the Drawings.
   1. Sizes: As indicated on Drawings.
      a. At MEN, provide equilateral triangle, with international male figure.
      b. At WOMEN, provide circle, with international female figure.
      c. At UNISEX, provide circle and inscribed equilateral triangle with international male and female figures.

D. Room Occupancy Signage: Shop fabricated signs with maximum occupancy numbers as indicated on Drawings.
   1. Size: As indicated on Drawings.
   2. Colors: As indicated on Drawings.

2.5 APPLIED VINYL SYMBOLS

A. Basis of Design: ADA signage on glass surface using Scotchcal ElectroCut Graphic Vinyl Film, Series 7725, manufactured by 3M, St. Paul, MN; tel: (800) 328-3908, or equal.
   1. Code-Required Decals on or Adjacent to Doors: Stock, preprinted decal, complying with CBC Section 1143A requirements, with International Symbol of Accessibility.
   2. Size: As indicated on Drawings.
   3. Color: As indicated on Drawings.

2.6 SIGNAGE CHARACTERS

A. Character (Letter and Number) Style: Characters size as indicated on the Drawings or, if not indicated, comply with CBC. Character style shall be Sans Serif uppercase letters, accompanied by Contracted Grade 2 Braille. Lettering to be raised minimum 1/32 inches (0.794 mm) above sign surface.

2.7 BRAILLE

A. Braille Indicators: On surface of signs where required, provide Braille symbols corresponding to sign text, in compliance with CBC Section 1143A. Braille symbols to be Contracted Grade 2, with dots 1/10 inch (2.54 mm) on centers within each cell and 2/10 inch (5.08 mm) space between cells. Dots to be raised a minimum of 1/40 inch (0.635 mm) above background, domed or rounded.
2.8 FABRICATION

A. Fabricate all work in accordance with the approved Shop Drawings.

B. All cutting, fabrication and assembly to be done in the factory and shipped to the job site as one complete unit, unless approved by the Owner.

C. All priming, surface preparation and paint application to be in accordance with the manufacturer’s written data, description and instructions for that type of material.

D. All signs to be flat, true and free of waviness.

2.9 FINISHES, GENERAL

A. All finishes, including coatings, shall be non-glare to meet requirements of CBC 1143A.

B. Metal Finishes:
   1. Comply with NAAMM’s "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   2. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.

C. Appearance of Finished Work:
   1. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.

2.10 FINISHING MATERIALS

A. Acrylic Polyurethane Paints: Factory applied baked acrylic polyurethane enamel paint that is UV resistant.
   1. Manufacturer: Matthews Paint (MPC); tel: (800) 323-6593; web: www.mathewspaint.com.

B. Silk Screening Materials:
   1. Provide photo processed screening, arranged to furnish sharp and solid images without edge build-up or bleeding of the coating. Pattern-cut screens may be used for non-repeat copy, provided that final image copy is equal to photo screen quality. Provide only non-glare weather-resistant coating materials, compatible with the intended substrates.

2.11 ACCESSORIES

A. Mounting Methods:
   1. Use concealed fasteners or other products for attachment indicated fabricated from materials that are not corrosive to sign material and mounting surface.

B. Adhesive: Provided or recommended by manufacturer; compatible with substrates.
   1. Comply with VOC content limits specified in related section.
2. Two-Sided Tape.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates and conditions, with installer present, for compliance with requirements for levelness, wall plumbness, and other conditions affecting performance of work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL
A. Perform work in cooperation with other trades and verify size, location and placement of all signage. Coordinate field measurements and Shop Drawings with fabrication and shop assembly.
B. Where adhesive is specified, only adhesives specifically recommended by the manufacturer for compatibility with the base materials and adhesive strength shall be used.
C. Sign faces and material shall utilize proper adhesives and shall be smooth, consistent, free of bubbles, bulging and foreign matter.
D. All finished work shall be non-glare, smooth, free of scratches, gouges and other imperfections. Sign edges shall be straight, smooth, free of cutting marks and other defects.
E. Restore all adjoining structures and surfaces of finishes where damaged or soiled by the sign installation. Restoration shall be performed by the Sign Fabricator or by original Trades if requested by the Owner.
F. Repair and replace materials or signs damaged during installation.
G. Retain protective coverings on signage and remove only when there is no possibility of damage from other work to be performed at the same location.

3.3 SIGNAGE INSTALLATION
A. Locate signage and accessories as indicated on the Drawings and as directed by Owner. Install signage using mounting methods of the type described and in compliance with the manufacturer’s instructions and recommendations.
1. Layout: Conform to layout information on reviewed shop drawings and as generally indicated on the Drawings. Locate signage to coordinate with joints and panel edges of substrate construction.
2. Fastening: Secure signage to substrate with anchoring method and fasteners as specified and as recommended by signage manufacturer. Make all penetrations of building envelope watertight.
3. Alignment: Install signage level, plumb, and at the height indicated, with sign surfaces free from distortion or other effects in appearance.
4. All signage is to be clean and free of all glue, tape and other extraneous materials.
5. All signage is to be free of fabricator's logo or identification.

B. Wall-Mounted Signs:
1. Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
2. Interior Sign Anchorage:
   a. Two-Sided Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
   b. Silicone Adhesive Mounting: Attach signs to irregular, porous, or vinyl-covered surfaces.
3. Signs Mounted on Glass: Provide black opaque decal, matching in size, on opposite side of glass to conceal mounting materials.

3.4 CLEANING

A. All debris relating to signage installation must be removed from the areas of the project after completion of the installation phase.

B. Provide in writing any specific signage maintenance specifications or upkeep instructions to the Client. This information relates specifically to the needs of all provided sign types contained in this document.

3.5 SIGNAGE SCHEDULE

A. Primary Room Identification Signs: Acrylic plaques.
B. Toilet Room Identification Signs: Acrylic plaques.
C. Toilet Room Door Signs: Acrylic plaques.
D. Maximum Occupancy Signs: Acrylic plaques.
E. Accessible Entry Identification Signs: Vinyl film.

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid color reinforced composite toilet compartments and screens.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 09 2216 “Non-Structural Metal Framing” for backing and blocking in walls.

D. Section 10 2800 “Toilet Accessories” for toilet compartment-mounted accessories and coordination of attachment.

1.4 REFERENCES


D. ASTM International:

1. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

D. Shop Drawings: Indicate layouts, swing of doors, elevations, anchorage and mounting details, components, hardware, finishes, and relevant dimensions.
   1. Furnish template drawings for anchorage locations in supporting members for attachment of compartments.
   2. Provide drawings showing locations for adequate steel reinforcements blocking and backing in walls to be provided by others for proper securing of the finished work.

E. Samples: Submit full range of color samples in manufacturer’s standard size of solid color reinforced composite materials.

F. Qualification Data: For Installer.

G. Sample Warranty: As specified.

H. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.
   2. Maintenance Data: For toilet compartments, to include in maintenance manual.
   3. Warranty: Submit executed warranty.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Acceptable to manufacturer with documented experience on at least 5 projects of similar nature in past 5 years.

B. Pre-Installation Conference: Conduct at Project site.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver and store products in manufacturer’s unopened packaging bearing the brand name and manufacturer’s identification until ready for installation.

B. Handle materials to avoid damage.
1.8 ENVIRONMENTAL REQUIREMENTS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

A. Refer to General Conditions for Contractor's General Guarantee requirements.

B. Manufacturer's Warranty: Provide manufacturer's standard limited warranty for panels, doors, and pilasters against breakage, corrosion, delamination, and defects in factory workmanship. Provide manufacturer's standard guarantee against defects in material and workmanship for stainless steel door hardware and mounting brackets.
   1. Warranty Period for Panels, Doors and Stiles: Twenty five (25) years from date of Substantial Completion.
   2. Guarantee Period for Stainless Steel Hardware and Mounting Brackets: One (1) year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

B. Regulatory Requirements: Comply with applicable provisions in the 2010 ADA Standards and CBC 11B for toilet compartments designated as accessible.

C. Flammability: Class B per ASTM E 84.

2.2 TOILET COMPARTMENTS


B. Design Type: Standard height.
   1. Door and Panel Height: 58 inches (147 cm).
   2. Floor Clearance: 12 inches (30 cm).
   3. Privacy Style Partitions: No sightlines with gap-free interlocking doors and stiles routed 0.300 inches (7.6 mm) from the edge to allow for 0.175 inch (4.4 mm) overlap to prevent line-of-sight into the toilet compartment. Privacy strips fastened or adhered onto the partition material are not acceptable.
C. Mounting Configuration: Floor-mounted and overhead-braced.
   1. Headrails: Extruded anodized aluminum headrails, 0.065 inch (1.65 mm) thick with anti-grip profile and satin finish.
   2. Stile Maximum Height: 83 inches (211 cm).

D. Compartment Material: Solidly fused plastic laminate with matte-finish melamine surfaces; integrally bonded colored face sheets and black phenolic-resin core.
   1. Edges: Black. Brown edges are not acceptable and will be rejected.
   2. Fire Resistance: Class B.
      a. Flame Spread Index: 30 for panels and stiles.
      b. Smoke Developed Index: 55 for panels, 20 for stiles.
   3. Finished Thickness:
      a. Stiles and Doors: 3/4 inch (19 mm).
      b. Panels and Screens: 1/2 inch (13 mm).

E. Stiles: Floor-anchored stiles furnished with expansion shields and threaded rods.
   1. Leveling Devices: 7 gauge, 3/16 inches (5 mm) thick, corrosion-resistant, chromate-treated, double zinc-plated steel angle leveling bar bolted to stile; furnished with 3/8 inch (10 mm) diameter threaded rods, hex nuts, lock washers, flat washers, spacer sleeves, expansion anchors, and shoe retainers.
   2. Stile Shoes: One-piece, 22 gauge (0.8 mm), 18-8, Type 304 stainless steel, 4 inch (102 mm) height; tops with 90 degree return to stile. One-piece shoe capable of being fastened (by clip) to stiles starting at wall line.

F. Anchors: Expansion shields and threaded rods at floor connections as applicable.

G. Hardware: All hardware to be concealed inside toilet compartment by use of factory installed threaded brass inserts that provide a metal to metal connection tested up to 1,500 pounds of pull force.
   1. Exposed hardware unacceptable.
      a. Exception: Outswinging doors.
   2. Operating Force: Less than 5 lb (2.25 kg).
   3. Emergency Access: Hinges, latch allow door to be lifted over keeper from outside compartment on inswing doors.
   4. Materials: ASTM A 666, 18-8, Type 304, heavy-gauge stainless steel with satin finish.
   5. Doorstops:
      a. Provide doorstops that prevent inswinging doors from swinging out beyond stile.
      b. Provide doorstops that prevent outswinging doors from swinging in beyond stile.
   6. Fastening: Hardware is secured to door and stile with pin-in-head Torx stainless steel machine screws.
      a. Hinges, latch and door stops secured to door with pin-in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts.
         1) Fasteners for hinges, latch and door stops secured directly into core not acceptable.
      b. Threaded Brass Inserts: Factory-installed; withstand direct pull force exceeding 1500 lb (680 kg) per insert.
   7. Clothes Hooks: Projecting no more than 1-1/8 inch (29 mm) from face of door.
8. Door Latch: Track of door latch prevents inswing doors from swinging out beyond stile; on outswing doors, door keeper prevents door from swinging in beyond stile; 16 gauge (1.6 mm) sliding door latch, 14 gauge (2 mm) keeper.

9. Locking: Door locked from inside by sliding door latch into keeper.

   a. Balanced, with field-adjustable cam to permit door to be fully closed or partially open when compartment is unoccupied.

11. Mounting Brackets: 18 gauge (1.2 mm) stainless steel and extending full height of panel.
   a. U-Channels: For securing panels to stiles.
   b. Angle Brackets: For securing stiles and panels to walls.

2.3 FABRICATION

A. Take field measurements prior to preparation of Shop Drawings and fabrication, where possible, to ensure proper fitting of work. However, allow for adjustments where taking of field measurements before fabrication might delay work.

B. Provide units with cutouts and drilled holes to receive compartment-mounted hardware, accessories, and grab bars, as indicated.

C. Provide compartment pilasters widths required by compartment sizes and spacing.

D. Compartment Doors Widths: 34 inch minimum clear door opening width at accessible compartments, and manufacturer’s standard width at other compartments.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions with Installer present for compliance with requirements, installation tolerances, and other conditions affecting performance of the work.

B. Examine conditions prior to proceeding with Work.
   1. Check areas scheduled to receive compartments for correct dimensions, plumbness of walls, soundness of wall surfaces, location of built-in anchorage/supporting devices, and other conditions that would affect proper installation of holding brackets and anchorage devices.
   2. Verify spacing of plumbing fixtures to ensure compatibility with compartment installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 INSTALLATION

A. Installation, General:
   1. Install in accordance with approved Shop Drawings and manufacturer’s printed instructions.
2. Install compartments rigid, straight and plumb.
3. No evidence of drilling, cutting, or patching to be visible in the finished work.
4. Rigidly attach compartments to supporting construction.
   a. Provide backing or blocking between studs for anchorage.

3.3 ADJUSTING

A. Adjust and lubricate hardware for proper operation after installation.
   1. Set hinges on inward swing doors to hold doors open approximately 30 degree angle from closed position when unlatched.
   2. Set hinges on outward swing doors to hold doors open approximately 10 degrees from closed position.
   3. Perform final adjustments to leveling devices and hardware.
   4. Adjust and align door hardware for uniform 3/16 inch clearance at vertical edges of doors.

B. Replace damaged material with new materials matching undamaged at no additional cost to Owner.

3.4 CLEANING AND PROTECTION

A. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage until date of Substantial Completion.

- END OF SECTION -
- SECTION 10 2600 -

WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes interior wall protection:
   1. Corner guards.
   2. Wall protection panels.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design Requirements.”

C. Section 05 5000 “Metal Fabrications” for bent metal plate guards not specified in this Section.

D. Section 08 7100 “Door Hardware” for door protection components.

E. Section 09 2216 “Non-Structural Metal Framing” for backing plates at wall framing.

F. Section 09 2900 “Gypsum Board” for substrate material.

G. Pertinent Sections specifying wall finishes.

1.4 REFERENCES


C. ASTM International:
D. Underwriters Laboratories Inc. (UL):
   1. UL (FRD) - Fire Resistance Directory.

1.5 DEFINITIONS
A. PETG: Polyethylene terephthalate, a fully-recyclable thermoplastic resin of the polyester family, injection molded or sheet extruded, and colored during processing.

1.6 ACTION SUBMITTALS
A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include construction details, material descriptions, impact strength, fire-test-response characteristics, dimensions of individual components and profiles, and finishes for each impact-resistant wall protection unit.
   2. Provide manufacturer’s technical data, installation instructions, setting drawings, templates, instructions, and directions for installation of anchorage devices in other work.

B. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives sealants, fillers, coatings and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

C. Shop Drawings: For each impact-resistant wall protection unit showing locations and extent. Include sections, details, and attachments to other work.

D. Samples: For each type of exposed finish required, prepared on Samples of size indicated below. Include Samples of accent strips to verify color selected where applicable.
   1. Corner Guards: 12 inches (300 mm) long. Include examples of joinery, corners, end caps, top caps, and field splices.
   2. Wall Protection Panels: 6 inches (150 mm) square.

1.7 INFORMATIONAL SUBMITTALS
A. Qualification Data: For qualified Installer

B. Material Certificates: For each impact-resistant plastic material, from manufacturer.

C. Material Test Reports: For each impact-resistant plastic material.

D. Sample Warranty: As specified.

E. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.
   2. Maintenance Data: For each impact-resistant wall protection unit to include in maintenance manuals.
      a. Include recommended methods and frequency of maintenance for maintaining optimum condition of plastic covers under anticipated traffic and use conditions.
b. Include precautions against using cleaning materials and methods that may be detrimental to plastic finishes and performance.

3. Warranty: Submit executed warranty.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wall Corner Guards: Full-size covers of maximum length equal to 2 percent of each type, color, and texture of units installed, but no fewer than two, 8 foot (2.4 m) long units.

2. Include mounting and accessory components. Provide replacement materials from the same production run as installed units.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain impact-resistant wall protection units from a single source and from a single manufacturer.

C. Pre-Installation Conference: Conduct conference at Project site.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver guards to site until rooms in which they are to be installed are ready to receive them.

B. Pack all parts individually in a manner to protect finish.

C. Store impact-resistant wall protection units in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1. Maintain room temperature within storage area at not less than 40 deg F (4 deg C) and not more than 100 deg F (38 deg C) during the period plastic materials are stored.

2. Keep plastic sheet material out of direct sunlight.

3. Store plastic wall protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F (21 deg C).

a. Store corner-guard covers in a vertical position.

b. Store handrail covers in a horizontal position.

D. Store wall protection panels flat.

E. Store packages to prevent physical damage or wetting.

F. Maintain protective covers on all units until final clean-up.
1.11 WARRANTY

A. Special Warranty: Work of this Section shall be jointly warrantied by the manufacturer and the installer for a period of one (1) year after Substantial Completion.
   1. Any material or workmanship that is judged defective during this period will be replaced at no cost to the Owner.

B. Manufacturer’s Warranty: Products are to be warranted by the manufacturer for a period of five (5) years after purchase.
   1. Any material or workmanship that is judged defective during this period will be replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers and coatings. Comply with limits specified in Section 01 6116.

B. Provide products free of PVC / PBT.

C. Fire Performance Characteristics: Provide engineered PETG wall protection system components with UL label indicating that they are identical to those tested in accordance with ASTM E 84 for Class A/1 characteristics listed below:
   1. Flame spread: 25 or less.
   2. Smoke developed: 450 or less.

2.2 MANUFACTURERS


B. Substitutions: Section 01 2500.

2.3 WALL PROTECTION CORNER GUARDS

A. Corner Guard at Staff Areas: Acrovyn® SM-20AN PETG Corner Guard.
   1. Type: 90 degree type with continuous aluminum retainer, 3 inch (76.1 mm) legs and 1/4 inch (6.4 mm) radius snap-on cover.
   2. Materials:
      a. Engineered extruded PETG, 0.078 inch (1.98 mm) thick.
      b. 6063-T6 extruded aluminum, 0.062 inch (1.57 mm) thick.
   3. Attachment: Non-corrosive fasteners by manufacturer compatible with aluminum retainers.
   4. Height: Partial or full-height as indicated on Drawings.
   5. Texture and Colors: Shadowgrain Texture, colors as indicated on Drawings.
   6. Provide color-matched end caps.
B. Corner Guard at Public Areas: Acrovyn® Model CO-8 Stainless Steel Corner Guard.
   1. Type: 90 degree type with custom 1 inch legs.
   2. Material: Stainless steel, Type 304, 16 gauge, No. 4 satin finish.
   3. Attachment: Screw attachment option by manufacturer.
   4. Height: Full height as indicated on Drawings.

2.4 WALL PROTECTION PANELS

A. Wall Protection Panel at Staff Areas: Acrovyn® 4000 0.060N Rigid Sheet High-Impact Wall Covering.
   1. Material: Engineered PETG.
   2. Nominal Thickness: 0.060 inch (1.52mm).
   3. Sheet Size: 4 feet (1.22 m) x full wall height, refer to Drawings.
   4. Texture and Colors: Suede Texture, colors as indicated on Drawings.

2.5 ACCESSORIES

A. Provide all appropriate mounting systems including all screws, bolts, brackets, end caps, base plates, metal trim and color-matched caulk as required for complete installation.

B. Fasteners: Nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

C. Adhesive: Provide adhesive recommended by manufacturer and complying with VOC limits in Section 01 6116.

2.6 FABRICATION

A. Fabricate impact-resistant wall protection units to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.

B. Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.

C. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.7 METAL FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Remove tool and die marks and stretch lines, or blend into finish.
   2. Grind and polish surfaces to produce uniform finish, free of cross scratches.
   3. Run grain of directional finishes with long dimension of each piece.
   4. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
B. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances, fire rating, and other conditions affecting performance of work.

B. Examine walls to which impact-resistant wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
   1. For impact-resistant wall protection units attached with adhesive or foam tape, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

A. Complete finishing operations, including painting, before installing impact-resistant wall protection system components.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

A. General: Install guards, rails, accessories, and items in accordance with manufacturer’s printed instructions.

B. Install true, plumb, and level, securely and rigidly anchored to substrate in accordance with manufacturer’s instructions for each item and each type of substrate construction.

C. Install impact-resistant wall protection units in locations and at mounting heights indicated on Drawings.

D. Provide mounting hardware, anchors, and other accessories required for a complete installation.

- END OF SECTION -
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Toilet room accessories.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements.”
C. Section 09 2216 "Non-Structural Metal Framing" for concealed backing required to support bathroom accessories.
D. Section 10 2113 “Toilet Compartments" for substrate to install accessories specified in this section.

1.4 REFERENCES


1.5 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Submit manufacturer’s catalog cut sheets, and data sheets.
B. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives sealants, fillers, coatings and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

C. Shop Drawings: Submit setting drawings, templates, instructions, and directions for installing anchorage devices and cut-out requirements in other work.

D. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required. Use designations indicated on Drawings.

E. Submit following Informational Submittals:
   1. Certifications specified in Quality Assurance article.
   2. Manufacturer’s installation instructions.

F. Sample Warranty: As specified.

G. Closeout Submittals:
   1. Submit under provisions of Division 01 7700.
   2. Maintenance Data: For toilet and bath accessories.
   3. Warranty: Submit executed warranty.

1.6 QUALITY ASSURANCE

A. Certification: Provide verification of grab bar strength and installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent Division 01 Sections specifying product handling requirements.

B. Pack accessories individually with protective wrappings.

1.8 KEYING

A. Keys: Provide universal keys for internal access to accessories for servicing and re-supplying. Provide minimum of six keys to Owner’s representative. Key “coin boxes” separately from dispensing units; furnish six separate keys.

1.9 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.
1.10 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Manufacturer's Mirror Warranty: Written warranty, executed by mirror manufacturer agreeing to replace mirrors that develop visible silver spoilage defects within minimum warranty period indicated.

1. Other warranty periods are available from some manufacturers. Modify warranty period below to suit products selected.
   a. Minimum Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.


C. General:

1. Names or labels are not permitted on exposed faces of accessories. On interior surface not exposed to view or on back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.

2. Surface-Mounted Toilet Accessories: Unless otherwise indicated, fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge. Provide concealed anchorage where possible.

3. Recessed Toilet Accessories: Unless otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors and access panels with full-length, stainless-steel hinge. Provide anchorage that is fully concealed when unit is closed.

D. Structural Performance: Design accessories and fasteners to comply with the following requirements:

1. Grab Bars: Installed units are able to resist 250 lbf (1112 N) concentrated load applied in any direction and at any point.

2. Shower Seats: Installed units are able to resist 250 lbf (1112 N) applied in any direction and at any point.

2.2 MANUFACTURERS

A. Single Source Responsibility: Provide products of each type from a single manufacturer for entire Project.
B. Owner Standard Equipment: All products with SKU numbers are associated with Fishman Supply, https://www.fishmansupply.com/. Provide these items as specified, no substitutions. Contact direct for items not found on the website.

C. Washroom and Toilet Accessories – Other Manufacturers:
   1. Basis of Design Products: Subject to compliance with requirements, provide products by the specified manufacturers:
   2. Acceptable Alternate: Subject to compliance with requirements, equivalent products by one of the following may be provided with written acceptance of the Architect.
      a. American Specialties, Inc. (ASI); web: www.asigroup.us.
   3. Substitutions: Section 01 2500.

2.3 PAPER TOWEL DISPENSERS

A. LoCor Electronic Hard Wound Roll Towel Dispenser - SKU# 61262

2.4 SOAP DISPENSERS

A. Basis of Design - Surface-Mounted Soap Dispensers: - Buckeye Symmetry Stealth Prestige 1250 mL Dispenser SKU# 94864.

2.5 MIRRORS

A. Sheet Mirrors: Type specified in Section 08 8300.

B. Basis of Design - Stainless Steel, Welded, Angle Frame Mirrors: Bobrick Model B-290 183X, sizes as indicated on Drawings. If no size is shown, provide 24 x 36 inches.
   1. Angle Frame:
      a. Materials: Type 304 stainless steel angle 3/4 inch x 3/4 inch (19 x19mm), with satin finish with vertical grain on exposed surfaces.
      b. Construction: One-piece, roll-formed construction with continuous integral stiffener.
      c. Design: Beveled design on front of angle to hold mirror tightly against frame; prevents exposure to sharp edges.
      d. Corners: Heliarc welded, ground, and polished smooth.
   2. Mirror:
      a. No. 1 quality, 1/4 inch (6mm) float/plate glass.
      b. Edges: Protected with plastic filler strips.
      c. Back of Mirror: Protected by full-size, shock-absorbing, water-resistant, non-abrasive 3/16 inch (5mm) thick polyethylene padding.
   3. Mounting: Removable, galvanized steel back with integral horizontal hanging brackets located at top and bottom for mounting on Concealed one-piece rectangular wall hanger(s); galvanized steel back fastened to frame with Concealed screws to permit glass
replacement; attachment by rivets or tabs is not acceptable; Concealed Phillips head locking setscrews secure mirror to wall hanger in bottom of frame.

2.6 TOILET TISSUE DISPENSERS

A. ADA Compliant Toilet Tissue Dispenser: Unit shall be continuous flow type. Dispensers that control delivery shall not be used per CBC 1115.B.9.3.

B. Surface-Mounted Toilet Tissue Dispenser: Tork 3-Roll Bath Tissue Dispenser For OptiCore - Black SKU# 41386.

2.7 SANITARY NAPKIN DISPENSER

A. Aunt Flow Dispenser – SKU# 210339 (not available on website: call directly).

2.8 SANITARY NAPKIN DISPOSALS

A. Surface-Mounted Sanitary Napkin Disposal Units:
   2. Container: All-welded, 18-8, Type 304, 22 gauge (0.8mm) stainless steel with satin finish on exposed surfaces. Front of container shall have same degree of arc, radius on corners and edges as other Bobrick ConturaSeries washroom accessories.
   3. Cover: Drawn, one-piece, seamless, 18-8, Type 304, 22 gauge (0.8mm) stainless steel with satin finish, construction. Front of cover has same degree of arc, radius on corners and edges as other Bobrick ConturaSeries washroom accessories.

2.9 GRAB BARS

A. Basis-of-Design Product: Grab Bar with snap flange covers, satin finish, and in length as shown on drawings: Bobrick B-5806 Series.
   1. Compliance: Universal/accessibility design, including ADA-ABA and ICC/ANSI for structural strength.
      a. Capacity: Designed to support 900 lbs. (408 kg) in compliant installations.
   2. Description: Grab bar with 90 degree return to flange. Clearance between grab bar and finished wall is 1-1/2 inches (38mm).
   3. Grab Bar Materials: 18-8, Type 304, 18 gauge (1.2mm) stainless steel tubing with satin finish, ends of grab bar pass through flanges and are heliarc welded to flanges to form one structural unit, outside diameter 1-1/4 inches (32mm).
   4. Mounting Flanges: Concealed, 18-8, Type 304, 1/8 inch (3mm) thick, stainless steel plate.
      a. End Flanges: 2 inches x 3-1/8 inches (50mm x 80mm) with two holes for attachment to wall.
      b. Intermediate Flanges: 2-5/8 inches x 3-1/8 inches (65mm x 80mm) wide x 3-1/8 inch (80mm) diameter.
   5. Snap Flange Covers: 18-8, Type 304, 22 gauge (0.8mm) drawn stainless steel with satin finish, 3-1/4 inch (85mm) diameter x 5/8 inches (16mm) deep; snap over mounting flange to conceal mounting screws.
6. Mounting Accessories: Provide the following optional mounting accessories as scheduled and indicated on the Drawings and as required for complete installation.
   a. Mounting Kits: Provide optional Bobrick Part No. 252-30 Mounting Kit; 3 Type 304 stainless steel, Phillips round-head, sheet-metal screws for each flange.
   b. Grab Bar Fasteners: Provide optional Bobrick Part No. 251-4 WingIt Grab Bar Fastener; round-head, Phillips 18/8 stainless steel screws and grab bar fastener for each flange.
   c. Anchor Devices: Provide optional Bobrick Part No. 2586 Optional Mounting Kit; for 1/2 inch (13mm) panels for each flange.

2.10 CHILD CARE PRODUCTS

A. Baby Changing Stations - General: Provide products which comply with the following standards and requirements.
   1. Antimicrobial Treatment: Changing surfaces embedded with Microban®, with antibacterial claim substantiated by Kirby-Bauer test or other manufacturer approved equivalent standard industry test methodology.
   2. Americans with Disabilities Act (ADA).
   4. ANSI Z535.4 - Product Safety Signs and Labels.
   7. European Standards: EN 12221 Changing units for domestic use.
   8. CPSIA: Conformity with the U.S. Product Safety Commission product safety rules, bans, standards and regulations that include applicable chemical compliance requirements.

B. Horizontal Design Stainless Steel Changing Stations: as manufactured by Koala Kare Products, a Division of Bobrick.
   1. Provide type indicated on Drawings, if no type is noted, provide recessed-mounted.
      a. Recessed-Mounted, Model KB110-SSRE
      b. Surface-Mounted, Model KB110-SSWM
   2. Materials: FDA approved blow molded high-density polyethylene (HDPE) clad in 18 gauge Type 304 stainless steel, brushed finish. Includes flange in same material and finish.
   3. Operation: Concealed pneumatic cylinder providing controlled, slow opening and closing of the changing station bed.
   4. Stainless Steel Liquid Diversion Channel: Prevents liquids that may be present on the changing surface from draining into the wall.
   5. Hinge Mechanism: Reinforced full-length steel-on-steel hinge with integrated steel hook plate.
   6. Changing Surface: Contoured, concave and smooth, 442 sq. in.
   7. Safety Straps: Replaceable, snap-lock, nylon protective holding straps.
      a. Infants Only, up to 3.5 years, <50 lbs.
10. Features: No hinge structure exposed on interior or exterior surfaces; two bag hooks; built-in liner dispenser with 25 liner capacity.

2.11 UNDERLAVATORY GUARDS

A. Basis of Design Product: The design for underlavatory guards is based on products by one of the following:

B. Underlavatory Guard:
   1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping, and allow service access without removing coverings.

2.12 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.

B. Sheet Steel: ASTM A 366, 20 gage minimum cold rolled, commercial quality, 0.0359-inch (0.9-mm) minimum nominal thickness; surface preparation and metal pretreatment as required for applied finish:

C. Galvanized Steel Sheet: ASTM A 653, G60.


E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service), nickel plus chromium electrodeposited on base metal.

F. Glass: Conforming to ASTM C 1036.


I. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel complying with ASTM A123 where concealed; theft-proof design at exposed conditions.

J. Expansion Shields: Type as recommended by accessory manufacturer for component and substrate.

K. Sanitary Sealant: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
1. Single-component silicone, mildew resistant, acid curing, ASTM C 920, Type S, Grade NS, Class 25, Use NT.
2. Products: Subject to compliance with requirements, provide one of the following:
   a. Dow Corning Corporation; 786-M White.
   b. GE Construction Sealants; SCS1700 Sanitary.
   c. Substitutions: Per Division 01.

2.13 FABRICATION
   A. Weld and grind smooth joints of fabricated components.
   B. Form exposed surfaces from single sheet of stock, free of joints.
   C. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
   D. Back paint components where contact is made with building finishes to prevent electrolysis.
   E. Shop-assemble components and package complete with fasteners, anchors, and fittings.
   F. Provide anchor plates, adapters, and anchor components necessary for installation.

2.14 FACTORY FINISHING
   A. Galvanizing After Fabrication: ASTM A123, 1.25 ounce per square yard.
   B. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
   C. Stainless Steel: No. 4 satin luster finish.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine conditions and proceed with Work when substrates are ready.
   B. Verify that site conditions are ready to receive work and dimensions are as indicated on shop drawings and instructed by manufacturer.
   C. Check openings blocking and frames for plumb.
   D. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION
   A. Deliver inserts and rough-in frames to site at appropriate time for installation.
   B. Provide templates and rough-in measurements as required.
C. Verify exact location of accessories for installation. Conform to referenced standards and applicable codes.

D. Confirm that related sections have provided blocking, reinforcing plates, concealed anchors and electrical service in appropriate locations.

E. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings.

F. Protect adjacent or adjoining finished surfaces and work from damage during installation.

G. Coordinate work with placement of wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

H. Supply rough-in data in sufficient time to be built into other work.

I. Do not install accessories until room finishes are completed.

J. Supply rough-in data in sufficient time to be built into other work.

K. Do not install accessories until room finishes are completed.

3.3 INSTALLATION

A. Install accessories according to manufacturers’ written instructions, using bolts, plates, and approved type fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights as required by referenced accessibility regulations.

1. Mount toilet accessories at heights and in locations in accordance with California Building Code (CBC) Section 11B.

B. Locate accessories to avoid interference with door swings or use of fixtures. Install accessories after wall finishes have been completed.

C. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

1. Anchor grab bars to drywall with concealed 16 gage steel anchor plates, or 4x wood blocking with A-35 clips to new framing.

2. Grab bars may not project more than 3 inches into the required clear floor space per CBC Section 11B-609.

D. Toilet paper and feminine napkin dispensers located on the grab bar side of an accessible toilet room or stall shall not be located closer than 1-1/2 inches clear of the tangent point of the grab bar.

E. Shower Seats: Install to comply with specified structural-performance requirements.

F. Seal fastener holes with sanitary silicone sealant prior to mounting accessories and grab bars in showers. Set entire plate and perimeter trim in sealant to ensure watertight installation at penetrations to walls or partitions.

G. Adjust accessories for proper operation and smooth mechanical function.
H. Built-in Equipment: Securely anchor units rigidly in place to supporting construction, cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.

I. Ensure successful completion of all required jurisdictional and Health Department inspections.

3.4 ADJUSTING AND CLEANING

A. Verify that required accessories are furnished and installed in exact locations required.

B. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

C. Remove packing material and leave units in clean condition, ready for operation.

D. Clean and polish exposed surfaces after removal of protective coverings according to manufacturer's written instructions.

3.5 ACCESSORIES SCHEDULE

A. Refer to Drawings.

- END OF SECTION -
- SECTION 10 4413 -

FIRE EXTINGUISHER CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Fire protection cabinets for portable fire extinguishers.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements.”
C. Section 07 8413 “Penetration Firestopping” for firestopping materials.
D. Section 07 9200 “Joint Sealants” for sealing joints.
E. Section 10 1400 "Signage" for signage adjacent to fire extinguisher cabinets.
F. Section 10 4416 "Fire Extinguishers" for fire extinguishers mounted inside of cabinets.

1.4 REFERENCES

A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CAL-Green”.
D. ASTM International:
   1. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
1.5 SUBMITTALS

A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets.
   2. Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

B. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

C. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
   1. Size: 6 by 6 inches (150 by 150 mm) square.

E. Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

F. Maintenance Data: Manufacturer’s standard maintenance manuals.

1.6 DELIVERY, STORAGE AND HANDLING

A. Comply with pertinent Division 01 Sections specifying product handling requirements.

1.7 COORDINATION

A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.
2.2 FIRE EXTINGUISHER CABINETS

A. Fire Extinguisher Cabinets: Fire-rated, semi-recessed style with flush, stainless steel door, frame and trim.

   1. Refer to Drawings.

C. Subject to compliance with requirements, provide named product or an equivalent product by one of the following manufacturers:
   1. Potter Roemer LLC.
   3. Substitutions: Section 01 2500.

D. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.0428 inch (1.1 mm) thick, cold-rolled steel sheet lined with minimum 5/8 inch (16 mm) thick, fire-barrier material. Provide factory-drilled mounting holes.
   1. Provide fire-rated assemblies (1-hour and 2-hour) as required to meet rating of adjacent wall assembly construction.

E. Concealed Cabinet Material: Heavy gauge steel with white baked enamel finish.

F. Door Style: Vertical Duo.

G. Door Construction and Material: 1/2-inch thick hollow metal of stainless-steel sheet.
   1. Stainless Steel Sheet: ASTM A 666, Type 304, No. 4 finish.
   2. Glazing: Clear acrylic.

H. Cabinet Trim Material: Same material and finish as door.

I. Cabinet Trim Projection: 2-1/2 inches with rolled edges.

J. Door Hardware:
   1. Manufacturer's cam lock door-operating hardware of proper type for cabinet type, door and trim material and style indicated.
      a. Cam lock allows door to be opened during emergency by pulling sharply on door handle.
   2. Projecting pull handle with satin finish.
   3. Continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.

K. Accessories:
   1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.

L. Identification: Die cut lettering on door per manufacturer.
   1. Text: FIRE EXTINGUISHER
2. Orientation: Vertical.

2.3 FABRICATION

A. Fire Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
   1. Weld joints and grind smooth.
   2. Provide factory-drilled mounting holes.
   3. Prepare doors and frames to receive locks.
   4. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
   1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
   2. Fabricate door frames of one-piece construction with edges flanged.
   3. Miter and weld perimeter door frames.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 STAINLESS-STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
   1. Run grain of directional finishes with long dimension of each piece.
   2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
   3. Directional Satin Finish: No. 4.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where recessed cabinets will be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 PREPARATION

A. Prepare recesses for semi-recessed fire protection cabinets as required by type and size of cabinet and trim style.

B. Maintain continuous fire-rated construction where recessed cabinets occur in fire-rated walls.

3.3 INSTALLATION

A. General: Install fire protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights below and acceptable to authorities having jurisdiction.

   1. Fire Protection Cabinets: Install cabinets such that the door handle and fire extinguisher handles are no higher than 40 inches above finish floor.

B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.

   1. Provide inside latch and lock for break-glass panels.

   2. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.

3.4 FIRESTOP AND ACOUSTICAL SEALANT INSTALLATION

A. Coordinate with Section 07 8413 for installation of firestopping materials outside cabinet assemblies to meet fire rating of wall assembly where cabinet is located. Coordinate to ensure firestopping is concealed inside wall construction.

B. Coordinate with Section 07 9200 for installation of acoustical joint sealant outside cabinet assemblies to meet acoustic rating of wall assembly where cabinet is located. Coordinate to ensure sealant is concealed inside wall construction.

3.5 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturers written installation instructions.

B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.

E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

- END OF SECTION -
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes portable, hand-carried fire extinguishers.

1.3 RELATED REQUIREMENTS
A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements.”
C. Section 10 4413 "Fire Extinguisher Cabinets" for cabinets and mounting brackets.

1.4 REFERENCES
A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, “CALGreen.”

1.5 SUBMITTALS
A. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher
B. Product Schedule: For fire extinguishers. Coordinate final fire extinguisher schedule with fire protection cabinet schedule to ensure proper fit and function and local fire authority.
C. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

D. Warranty: Sample of special warranty.

1.6 QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE AND HANDLING

A. Comply with pertinent Division 01 Sections specifying product handling requirements.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure of hydrostatic test according to NFPA 10.
      b. Faulty operation of valves or release levers.
   2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire protection cabinet indicated.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Amerex Corporation.
      c. Larsen's Manufacturing Company.
   2. Valves: Stainless steel, or aluminum.
   3. Handles and Levers: Manufacturer’s standard.
   4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.

B. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 2-A:10-B:C, 5-lb (2.3-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.
   1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

- END OF SECTION -
## DIVISION 11 – EQUIPMENT

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PART 1 - GENERAL

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

1.2 SUMMARY
   A. This Section includes the following:

1.3 RELATED REQUIREMENTS
   A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
   B. Section 01 8113 “Sustainable Design Requirements.”

1.4 REFERENCES
   A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code,
      “CAL-Green.”
   B. California Code of Regulations, Title 24, Part 2, California Building Code (CBC), International
      Building Code, with California Amendments.
   C. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and
   D. 28 CFR 35.151 Standards for State and Local Government Facilities: Title II.

1.5 SUBMITTALS
   A. Product Data: For each type of product indicated, demonstrate compliance with specified
      attributes.
      1. Include construction details, material descriptions, dimensions of individual components
         and profiles, and finishes for each type of postal specialty.
B. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

C. Shop Drawings: For each type of specialty. Include plans, elevations, sections, details, and attachments to other work.

1.6 QUALITY ASSURANCE
A. Source Limitations: Obtain boxes through one source from a single manufacturer.
B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.7 DELIVERY, STORAGE, AND HANDLING
A. Deliver lock keys to Owner by registered mail or overnight package service with a record of each corresponding lock and key number.

1.8 WARRANTY
A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of book depositories that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
   2. Faulty Operation of Hardware and Door Locks: Entire lifetime of product.
   3. Deterioration of Metals, Metal Finishes, and Other Materials Beyond Normal Weathering: Entire lifetime of product.
   4. Rust, Corrosion or Leakage: Entire lifetime of product.
   5. Fabrication and Workmanship: Entire lifetime of product.

1.9 EXTRA MATERIALS
A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Keys: Furnish 10 operating keys for door lock installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.
2.2 THROUGH-WALL BOOK DEPOSITORIES

   1. Substitutions: Section 01 6000.

B. Description:
   1. Wide opening accepts most materials including standard size books, large children’s books, reference materials, audio books, and DVD’s. Can be installed on the front of a circulation desk or on an interior wall (not for exterior/outdoor use).
      a. Depository Opening: 19-5/8" W x 3-1/2" H [498.47 mm W x 88.9 mm H]
   2. Materials:
      a. Exterior: Heavy-duty stainless steel faceplate and depository door flap.
      b. Interior: 4-sided aircraft grade aluminum chute (extends 8").
   3. Theft Deterrence:
      a. The angle and length of chute prevent reaching inside through the depository door.
   4. Depository Door/Locking:
      a. Door opens upward and is gravity and weight balanced allowing it to automatically close after materials have passed through. Door locks from the inside with thumbscrews on either side.
   5. Exterior Graphics.
      b. Braille Tags: “Book Drop”.
   6. Accessories:
      a. Under-Counter Cart: Manufacturer’s standard type.

2.3 OUTDOOR DEPOSITORIES

   1. Substitutions: Section 01 6000.

B. Description:
   1. Fully sealed to prevent leaking in adverse weather conditions such as rain, ice, snow, and dust. Full ramped bottom is sloped to shed water from inside the depository. Sloped and radius hood helps shed water. Built-in door drip rail comes standard and helps deter water from entering at top of cart door. Chute is designed to prevent water from entering the collections area under normal circumstances.
      a. Easy 360 degree hood rotation.
      b. Depository Opening: 18" W x 2-1/2" H
   2. Materials:
      a. All component parts: 12 gauge aircraft grade aluminum for high strength and excellent dent resistance.
   3. Theft Deterrence:
      a. The angle and length of chute prevent reaching inside through the depository door.
b. Exclusive Kingsley theft deterrent chute design. Full-length stainless steel hinge on access door. No corner seams to pull apart.

4. Fire Suppression: Airtight design smothers most fires in less than 1 minute.

5. ADA Compliance: ADA compliant when properly installed.

6. Cart Access Door/Locking:
   a. Cart Access Door: 3-point locking (top, bottom, and opening side). Keyed paddle lock with weather sealed lock cover to prevent freezing and keep dirt out.

   b. Braille Tags: “Book Drop”.

8. Available Finishes: As selected by Architect from Black, Blue, Bronze, Graphite, Luster, Sandstone, or White. Includes Graffiti-X clear coat.

9. Accessories:
   a. Under-Counter Cart: Manufacturer's standard type.

**PART 3 - EXECUTION**

3.1 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances, clearances, and other conditions affecting performance of work.

B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install products according to manufacturers' written instructions, using bolts, plates, and approved type fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights as required by referenced accessibility regulations.

   1. Mount items at heights and in locations in accordance with California Building Code (CBC) Section 11B.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as book depositories are installed, unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of installation, clean interior and exterior surfaces as recommended by manufacturer.
D. Replace book depositories that have been damaged or have deteriorated beyond successful repair by minor repair procedures.

- END OF SECTION -
# DIVISION 12 – FURNISHINGS

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Manually operated roller window shades.

1.3 RELATED REQUIREMENTS

A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 8113 “Sustainable Design (LEED) Requirements.”

C. Section 09 2216 “Non-Structural Metal Framing” for mounting backing plates in metal framing.

1.4 REFERENCES


C. ASTM International:

D. National Fire Protection Association (NFPA):

E. Window Covering Manufacturers Association (WCMA):
1.5 SUBMITTALS

A. Product Data: For each type of product.

B. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 61 16.

C. LEED Submittals:
   1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
   2. Product Data for Credit IEQ 4.1: For adhesives, sealants and sealant primers used inside or outside the weatherproofing system, documentation including printed statement of VOC content.
   3. Product Data for Credit MR 5.1 and 5.2: Submit product data indicating location of material manufacturer and location of extraction, harvest or recovery for regional materials.
      a. Include statement indicating cost of material and distance from point of extraction, harvest or recovery and manufacture to Project site for each regional material.
      b. Include statement indicating the percentage by weight of the product or material which is regionally extracted, harvested, or recovered.

D. Shop Drawings: For roller window shades, include fabrication and installation details.

E. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
   1. Ceiling suspension system members and attachment to building structure.
   2. Ceiling-mounted or penetrating items including light fixtures, air outlets and inlets, speakers, sprinklers, recessed shades, and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
   3. Shade mounting assembly and attachment.
   4. Size and location of access to shade operator, motor, and adjustable components.

F. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.

G. Selection Samples: For each finish product specified, one set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.

H. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shade cloth sample and aluminum finish sample as selected. Mark face of material to indicate interior faces.

I. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

J. Product Certificates: For each type of roller shade, signed by product manufacturer.

K. Qualification Data: For Installer.
L. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for each type of roller shade.

M. Closeout Submittals:
   1. Maintenance Data: For roller window shades to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.
   1. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years of experience in installing products comparable to those specified in this section.

B. Manufactures Qualifications: Manufacturer with a minimum of five years of experience in manufacturing products comparable to those specified in this section.

C. Source Limitations: Obtain roller shades through one source from a single manufacturer.

D. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
   1. Flame-Resistance Ratings: Passes NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.

E. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

F. Product Standard: Provide roller shades complying with ANSI/WCMA A 100.1.

G. Mockup: Provide a mockup of one roller shade assembly for evaluation of mounting, appearance and accessories.
   1. Locate mockup in window designated by Architect.
   2. Do not proceed with remaining work until, mockup is accepted by Architect.
   3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install roller window shades until construction and wet-work and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
B. Field Measurements: Where roller window shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Construction Manager of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

**PART 2 - PRODUCTS**

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 ROLLER WINDOW SHADES


B. Subject to compliance with requirements, provide named product or an equivalent product by one of the following manufacturers:

1. Draper, Inc. Spiceland, IN; tel: (800) 238-7999; web: [www.draperinc.com](http://www.draperinc.com).
4. Substitutions: Section 01 2500.

2.3 ROLLER SHADE TYPES

A. Manually operated shades with metal bead chain-and-clutch operating mechanism.

1. Surface mounted with fascia closure.

2.4 MANUAL ROLLER SHADE OPERATION

A. Continuous-loop bead-chain, clutch, cord tensioner and bracket lift operator.

1. Pull: Manufacturer's standard hand-grip engaged pull.
2. Position of Clutch Operator: To be determined by Architect.
3. Clutch: Capacity to lift size and weight of shade; sized to fit roller or provide adaptor.
4. Lift-Assist Mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.
5. Loop Length: Full length of roller shade.
7. Cord Tensioner Mounting: To be determined by Architect.
8. Shade Coupler System: Designed for simultaneously operating two shade rollers with a single chain. Provide system for each group of shades where indicated.
9. Operating Function: Stop and hold shade at any position in ascending or descending travel.

2.5 SHADE BAND

A. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube.

B. Rollers: Electrogalvanized or epoxy primed steel or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with adhesive strip for attaching shade material. Provide capacity for two roller shade band(s) per roller, unless otherwise indicated on Drawings.

C. Direction of Roll: Regular, from back of roller and reverse, from front of roller.

D. Mounting:
1. Roller shade brackets provide symmetrical light gaps of 0.75 inch (20 mm) on each side of shade
2. Two-piece mounting bracket provides level, projection, and shade centering adjustments from mounting bracket.
3. System shall have a roller shade leveling adjustment that allows level adjustment while the roller shades are mounted to the brackets.
4. System shall allow a side-to-side adjustment of up to ±0.375 inch (9 mm) on each side while the shade is mounted to the bracket to properly center shade over the window.
5. System shall have a projection adjustment of up to 0.50 inch (12 mm) allowing the shade to clear the trim or move the shade closer to the window in order to have a tighter seal between the fabric and the window.

E. Fascia: For surface mounting on walls as indicated on Drawings.
1. L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as indicated on Drawings; removable design for access.
2. Provide end caps that match fascia material and finish.

F. Top/Back Cover: L-shaped; material and finish to match fascia; combining with fascia and end caps to form a six-sided headbox enclosure sized to fit shade roller and operating hardware inside.

G. Pocket-Style Headbox: For recessed mounting in acoustical panel ceilings or drywall ceilings as indicated on the Drawings.
1. U-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; with a bottom cover consisting of slot opening of minimum dimension to allow lowering and raising of shade and a removable or an openable, continuous metal access panel concealing shade roller, brackets, and operating hardware and operators within.

H. Bottom Bar: Steel or extruded aluminum, with plastic or metal capped ends. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.
2.6 SHADE CLOTH

A. Visually Translucent Shade Cloth: MechoShade ThermoVeil® Vertical Privacy Weave 0900 Series,
   1. Openness Factor: 1 percent.
   3. Content: 75 percent PVC (coating), 25 percent polyester (yarn).
   4. Flammability: Passes NFPA 701-2004
   5. Colors: As selected by Architect from manufacturer’s full range.

B. Blackout Shade Cloth: Classic Blackout; Series 0700 Opaque.
   1. Room Darkening Fabric, 4-ply, 12 mil laminated fiberglass; washable, flame retardant, white color outside.
   2. Flammability: Passes NFPA 701-2004
   3. Colors: As selected by Architect from manufacturer’s full range.

2.7 SHADE FABRICATION

A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.

B. Fabricate shade cloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shade cloth to roll true and straight without shifting sideways more than 1/8 inch (3.18 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design. Fabricate hem as follows:

C. Provide battens in standard shades as required assuring proper tracking and uniform rolling of the shade bands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shade cloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

D. For railroaded shade bands, provide seams in railroaded multi-width shade bands as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Seams shall be properly located. Furnish battens in place of plain seams when the width, height, or weight of the shade exceeds manufacturer's standards. In absence of such standards, assure proper use of seams or battens as required to, and assure the proper tracking of the railroaded multi-width shade bands.

E. Provide battens for railroaded shades when width-to-height (W:H) ratios meet or exceed manufacturer's standards. In absence of manufacturer's standards, be responsible for proper use and placement of battens to assure proper tracking and roll of shade bands.

F. Blackout shade bands, when used in side channels, shall have horizontally mounted roll-formed stainless steel or tempered-steel battens not more than 3 feet (115 mm) on center extending fully into the side channels. Battens shall be concealed in a integrally-colored fabric to match the inside and outside colors of the shadeband, in accordance with manufacturer's published standards for spacing and requirements.
1. Battens shall be roll formed of stainless steel or tempered steel and concave to match the contour of the roller tube.
2. Batten pockets shall be self-colored fabric front and back RF welded into the shade cloth. A self-color opaque liner shall be provided front and back to eliminate any see-through of the batten pocket that shall not exceed 1-1/2 inches (38.1 mm) high and be totally opaque. A see-through moire effect, which occurs with multiple layers of transparent fabrics, shall not be acceptable.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.
B. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates and surrounding conditions.

3.2 ROLLER SHADE INSTALLATION
A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer’s written instructions, and located so shade band is not closer than 2 inches (50 mm) to interior face of glass. Allow clearances for window operation hardware.

3.3 ADJUSTING
A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION
A. Clean roller shade surfaces after installation, according to manufacturer’s written instructions.
B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION
A. Engage a factory-authorized service representative to train Owner’s maintenance personnel to adjust, operate, and maintain roller shades. Refer to Division 1 Section “Demonstration and Training.”
3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.7 SCHEDULE

A. Manually Operated Shade **WN1**:
   2. Configuration: Solar shade cloth and Blackout Cloth.
      a. Shade Cloth: 1 percent openness factor.
      b. Blackout Cloth: Series 0700 Opaque.

B. Manually Operated Shade **WN2**:
   2. Configuration: Single solar shade cloth.
      a. Shade Cloth: 1 percent openness factor.

- END OF SECTION -
- SECTION 12 3661 -

SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section Includes:
   1. Shop fabrication of solid surfacing countertops, including integral sinks.

1.3 RELATED REQUIREMENTS
A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 8113 “Sustainable Design Requirements.”
C. Section 06 4100 “Architectural Cabinets” for cabinets receiving solid surfacing countertops.
D. Section 07 9200 “Joint Sealants” for sealing perimeter of solid surfing units to adjacent surfaces to produce a water tight attachment.
E. Section 09 2900 “Gypsum Board” for substrate material.
F. Section 12 3623 “Plastic Laminate Countertops.”

1.4 REFERENCES
C. ADA Standards – Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
D. American National Standards Institute (ANSI):
E. ASTM International:


G. National Electrical Manufacturers Association (NEMA):
   1. NEMA LD-3 - Performance Testing of High Pressure Decorative Paper Laminates.

H. National Fire Protection Association (NFPA):

I. Underwriters Laboratories, Inc. (UL):

J. University of Pittsburgh Test Protocol (Upitt):

1.5 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related Sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.
   1. Include product description, fabrication information and compliance with specified performance requirements.
C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

D. Shop Drawings: Indicate dimensions, component sizes, fabrication details, attachment provisions and coordination requirements with adjacent work.

E. Samples: Submit minimum 2 inches x 2 inches (50 mm x 50 mm) samples. Indicate full range of color and pattern variation. Approved samples will be retained as standards for work.

F. Qualification Data: For Fabricator and Installer.

G. Sample Warranty: As specified.

H. Closeout Submittals:
   1. Submit under provisions of Section 01 7700.
   2. Maintenance Data: For solid surfacing fabrications, to include in maintenance manual.
   3. Warranty: Submit executed warranty.

1.6 QUALITY ASSURANCE

A. Fabricator and Installer Qualifications: Acceptable to manufacturer with documented experience on at least 5 projects of similar nature in past 5 years.

B. Quality Standard: Unless otherwise indicated, comply with North American Architectural Woodwork Standards (NAAWS) for grades of solid surfacing countertops indicated for construction, finishes, installation, and other requirements.

C. Pre-Installation Conference: Conduct at Project site.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver fabricated units to project site when areas are ready for installation. Store components indoors prior to installation.

B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.8 WARRANTY

A. Refer to General Conditions for Contractor’s General Guarantee requirements.

B. Provide manufacturer’s ten (10) year warranty against defects in materials. Warranty provides material and labor to repair or replace defective materials. Damage caused by physical or chemical abuse, or damage from excessive heat, will not be warranted.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 SOLID POLYMER COUNTERTOPS

A. Basis of Design Product: Subject to compliance with requirements, provide product indicated on Drawings.
   1. Surface Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      a. Flame Spread Index: 25 or less.
      b. Smoke Developed Index: 25 or less.
      c. Integral Sink Bowls: Comply with CSA B45.5/IAPMO Z124.
   2. Colors and Patterns: As indicated on Drawings.
   3. Substitutions per Section 01 2500.

B. Subject to compliance with requirements, provide named product or an equivalent product by one of the following manufacturers:
   2. Avonite Surfaces; www.avonitesurfaces.com
   3. Wilsonart LLC, 051.
   4. Substitutions: Section 01 2500.

C. Material Description: Homogeneous solid polymer sheets of acrylic resin complying with ISSFA-2, meeting ANSI Z124.3 and .6, Type Six, and Federal Specification WW-P-541E/GEN.
   1. Superficial damage to a depth of 0.010 inch (0.25 mm) to be repairable by sanding and polishing.

D. Physical and Performance Properties:
   1. Material Thickness: 1/2 inch (12 mm). 3/4 inch (19 mm)
   2. Color, Pattern, and Finish: As indicated on Drawings.
   3. Tensile Strength: 6,000 psi per ASTM D 638.
   4. Tensile Modulus: 1.5 x 10^6 psi per ASTM D 638.
   5. Tensile Elongation: 0.4 percent minimum per ASTM D 638.
   6. Flexural Strength: 10,000 psi per ASTM D 790.
   7. Flexural Modulus: 1.2 x 10^6 psi per ASTM D 790.
   10. Thermal Expansion: 1.8 x 105 in/in/°F (3.02 x 105 in/in/°C) per ASTM D 696.
   11. Gloss: 5 (matte) - 75 (highly polished) per ANSI Z124.
   12. Light Resistance (Xenon Arc): No effect per NEMA LD 3, Method 3.3.
15. Fungus and Bacteria Resistance: Does not support microbial growth per ASTM G 21.
18. Izod Impact (Notched Specimen): 0.28 ft.-lbs/in of notch per ASTM D 256, Method A.
   a. 1/4 inch thick slab: 36 inch drop.
   b. 1/2 inch thick slab: 144 inch drop.
20. Specific Gravity: 1.7 per ASTM D 792.
   a. 1/4 Inch Thick Slab: 0.8 percent.
   b. 1/2 Inch Thick Slab: 0.6 percent.
   c. 3/4 Inch Thick Slab: 0.4 percent.
23. Flammability (All Colors): ASTM E 84.
   a. Class I and Class A per NFPA 255 and UL 723.
      1) Flame Spread Index: <25.
      2) Smoke Developed Index: <25.

E. Quality Standard: Unless otherwise indicated, comply with the "North American Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.
   1. NAAWS Grade: Premium.

F. Backsplashes: Provide at wet areas and where indicated on Drawings.

G. Integral Lavatories: ADA-Compliant.
   1. Dimensions: 18 inches (457 mm) long x 12-3/4 inches (324 mm) wide x 5 inches (127 mm) deep.
   2. Attachment: Seamed undermount.

2.3 AUXILIARY MATERIALS

A. Joint Adhesive: Provide adhesive system as recommended by solid surfacing manufacturer for material, and complying with Section 01 6116, to create inconspicuous, non-porous joint with a chemical bond.

2.4 FABRICATION

A. General:
   1. Fabricate units in shop to greatest extent practical in accordance with approved Shop Drawings.
   2. Fabricate units in one piece, unless otherwise indicated. Comply with solid surfacing material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.
a. Exposed surfaces to be free of tool marks, scratches and blemishes.

B. Countertop Fabrication:
   1. Fabricate tops with shop-applied edges of materials and configuration indicated.
   2. Fabricate tops with shop-applied coved backsplashes where indicated on Drawings.
   3. Install integral sink bowls in countertops in shop.
   4. Drill holes in countertops for plumbing fittings in shop.

C. Rout and finish component edges to a smooth, uniform finish. Rout all cutouts, and then sand all edges smooth. Repair or reject defective or inaccurate work.

D. Finish: Provide uniform finish on all surfaces of each solid surfacing unit.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions with Installer present for compliance with requirements, installation tolerances, and other conditions affecting performance of the work.

B. Verify preparatory work by other trades is complete.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates.

3.2 INSTALLATION

A. Countertop Installation: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
   1. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Keep components and hands clean when making joints.
      a. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
   2. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
   3. Seal space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

3.3 CLEANING AND PROTECTION

A. Remove excess adhesive with product recommended by solid surfacing material manufacturer.

B. Protect surfaces from damage until date of Substantial Completion. Repair or replace damaged work that cannot be repaired to Owner’s Representative’s satisfaction.
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- SECTION 21 0000 -

FIRE PROTECTION GENERAL

PART 1 - GENERAL

1.1 GENERAL

A. The General Conditions and Supplementary General Conditions are hereby a part of this Section as fully as if repeated herein.

1.2 SCOPE

A. The work includes, but is not necessarily limited to, the furnishing of all labor, materials, equipment, and services necessary for, and reasonably incidental to, providing and installing complete fire protection systems, and other work as shown or indicated in the Fire Protection Drawings and Specifications.

B. Consult all other Sections to determine the extent and character of this work specified elsewhere.

C. Specifically refer to the following:
   1. Section 21 0500 Overhead Fire Protection
   2. Section 21 1000 Underground Fire Service

D. Make all connections to equipment requiring service from systems installed under this Section.

1.3 COORDINATION

A. Before submitting a bid for the fire protection work the Contractor shall visit the site and become familiar with all the work on other related Drawings and Specifications, and plan the work to provide the best possible assembly of the combined work of all trades. No additional costs will be considered for work which has to be relocated due to conflicts with other trades.

B. If, after examination of the bidding documents relating to the work, the Contractor has queries concerning the nature and scope of the work or intent of the Specifications, he/she shall promptly request clarification from the Architect. After contract award, claims of ignorance of the intent and scope of the contract shall not be allowed.

C. Contractor is responsible for coordinating the schedule of inspections by Engineer at appropriate stages of construction such as rough-in, pre-final, and final, and at other times required by the Specifications or by the construction. Notify Architect and Engineer seven (7) days in advance of proposed site visit. Notification constitutes certification that construction is, or will be, complete and ready for inspection.
D. Coordination Drawings: All work of this section must be coordinated to clear all work of other sections. Provide coordination drawings for all work of this section/division; see Division 01. For site utilities, see architectural drawings for additional coordination requirements.

1.4 COORDINATION DRAWINGS

A. The contractor shall prepare and submit, for review, large scale (minimum 1/8" = 1'-0") coordination drawings showing location and elevations of all equipment, ducts, piping, cable trays, conduits, structural, and other items in the area. These shall be fully coordinated with all other trades and Owner supplied items. Check routing and elevations of all piping, ductwork, conduit and equipment before fabricating. Report any conflicts that cannot be solved in the field to the Architect/Engineer. Extra charges shall not be allowed due to lack of coordination prior to, or during, construction. These drawings shall be distributed to, and coordinated with, all other trades that are affected.

1. In addition to plan view, indicate heights to clarify clearances from structure and from other trades. Use partial sections where necessary.
2. Provide proper clearances for access to and service of all equipment and items requiring adjustment including shutoff valves.
3. Coordinate the location of access panels in the hard ceiling areas to insure all equipment and devices have proper access for servicing and adjusting.
4. The coordination drawings shall be reviewed and checked for completeness by the general contractor. Review by the architect and engineer is to assist the contractor and to attempt to point out obvious errors. Responsibility for proper coordination shall remain with the contractor.

B. Differences or disputes concerning coordination, interference, or extent of work between sections shall be decided by general contractor.

C. Extra charges shall not be allowed due to lack of coordination (or lack of coordination drawings) prior to or during construction.

D. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work. Indicate the proposed locations of ductwork, piping, conduit, equipment, and materials. Include the following:

1. Clearances for installing and maintaining insulation, including clearances for servicing and maintaining equipment, and space for equipment disassembly required for periodic maintenance.
2. Clearances for electrical and control components and panels.
3. Equipment connections and support details.
4. Exterior wall and foundation penetrations.
5. Interior floor penetrations.
6. Fire rated wall and floor penetrations.
7. Sizes and location of required concrete pads and bases.
8. Support, bracing and anchor locations for equipment and conduit.

E. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
F. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.

G. Prepare reflected ceiling plans to coordinate and integrate installations, access panel and door locations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling mounted items where ceilings are to be installed.

1.5 SAFETY

A. Contractors must conduct a weekly safety meeting with their employees and provide documentation as to attendance and topics of discussion. Engineer's construction support services do not constitute review or approval of Contractor's safety procedures. Contractor shall comply with all OSHA regulations. Contractor is required to obtain and pay for insurance required to cover all activities within Contractor's Scope of Work.

1.6 BUILDING LAWS

A. Fire Protection work shall conform to all requirements prescribed by governmental bodies having jurisdiction and is to be in accordance with the California Building Code; all federal, state, and local codes and ordinances; all OSHA requirements; California Plumbing Code, California Mechanical Code, California Fire Code, and National Fire Protection Association; California State Code Title 8, Title 21, Title 24; and the Energy Conservation Standards.

B. Should any part of the design fail to comply with such requirements, the discrepancy shall be called to the attention of the Architect prior to submitting bid.

C. Should there be any direct conflict between the Drawings and/or Specifications and the above rules and regulations, the rules and regulations shall take precedence. However, when the indicated material, workmanship, arrangement, or construction is of a superior quality or capacity to that required by above rules and regulations, the Drawings and/or Specifications shall take precedence. Rulings and interpretations of enforcing agencies shall be considered as part of the regulations.

D. After a Contract is awarded, if minor changes or additions are required by the aforementioned authorities, even though such work is not shown on Drawings or overtly covered in the Specifications, they must be included at the Contractor's expense.

E. The Contractor is responsible to coordinate and make adjustments in his/her work with the full set of Contract Drawings and Specifications.

F. All piping, and equipment shall be securely anchored to building structure as required herein and by the California Building Code and NFPA 13.

1.7 UNDERGROUND CONNECTIONS

A. See Section 21 10 00 for Underground Fire Service connection requirements.
1.8 TEMPORARY CONSTRUCTION WATER

A. The Contractor shall make all arrangements and provide necessary facilities for the temporary construction water from the Owner’s source. Costs for the temporary construction water shall be paid for by Owner.

1.9 PAINTING

A. See Section 09 for painting of piping, equipment, etc.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials used shall be new as listed in subheadings and indicated on Drawings. Inspect all materials and immediately remove defective materials from the site.

B. All electrical materials shall bear the label of, or be listed by, the Underwriters’ Laboratories (UL), unless the material is of a type for which label or listing service is not provided.

C. Substitution:
   1. No substitute materials or equipment may be installed without the written approval of the Architect.
   2. Use of substitute materials or equipment may require changes in associated materials and equipment. Contractor shall submit detailed Shop Drawings and installation instructions of substitute materials and equipment to Architect for approval. Such submittals shall address all changes required in other items.
   3. All additional costs incurred by the substitution of material or equipment, or the installation thereof whether Architectural, Structural, Mechanical, Plumbing, or Electrical shall be borne by the Contractor who substitutes the materials or equipment in place of the items specified.

D. Quality of Materials: Pipe fittings and equipment may be taken from stock but the Contractor will be required to submit manufacturer’s certificates identifying the material and equipment furnished as conforming with these Specifications and such codes and standards as apply to the equipment specified. Any material on the site which cannot be identified by manufacturer’s mark shall be removed from the site at Architect’s request.

2.2 SUBMITTALS

A. The review of submittals and approval thereof by the Architect does not relieve the Contractor from compliance with the requirements and intentions of the Drawings and Specifications to which the submittals pertain. The contractor acknowledges its responsibility to submit complete shop drawings and other required submittals. Incomplete submittals will be returned to the contractor unreviewed.

B. Material List: An itemized list of material and equipment which the Contractor proposes to use shall be submitted to the Architect with number of copies indicated and within time indicated.
C. Shop Drawings and Product Data:
   1. Submit all required Shop Drawings, product data, etc. at one time. Submittals shall be bound, tabbed, and properly indexed by Specification Section.
   2. Each item shall be identified by manufacturer, brand, and trade name; model number, size, rating, and whatever other data is necessary to properly identify and verify the materials and equipment. The words "AS SPECIFIED" will not be considered sufficient information.
   3. Each submittal shall bear the Contractor’s stamp and mark indicating the Contractor has reviewed and approved the submittal.
   4. Each submitted item shall refer to the Specification Section and paragraph in which the item is specified.
   5. Accessories, controls, finish, etc. not required to be submitted or identified with the submitted equipment shall be furnished and installed as specified.
   6. Submittals shall be all inclusive with all items requiring submittals being submitted at the same time; individual submittals will not be accepted.
   7. Place orders for all equipment in time to prevent any delay in construction schedule or completion of project. If any materials or equipment are not ordered in time, additional charges made by equipment manufacturers to complete their equipment in time to meet construction schedule, together with any special handling charges, shall be borne by Contractor.

PART 3 - EXECUTION

3.1 DRAWINGS
   A. The Contract Drawings show the general arrangement and location of the piping and equipment. Work shall be installed in accordance with the Drawings, except for changes required by conflicts with the work of other trades. The Contractor shall provide for the support, expansion, and pitch of any rearranged piping in conformance with the intent of the Drawings, Specifications, and codes.

   B. Note that certain fire protection work is shown, wholly or in part, on Architectural Drawings.

   C. The contractor shall field verify existing conditions and provide accurate shop coordination drawings for coordination with other trades in accordance with Division 1.

   D. Fire Protection Drawings are diagrammatic and are intended to show the approximate location of equipment and piping. Dimensions shown on Drawings shall take precedence over scaled dimensions on Drawings. All dimensions shall be verified in the field by the Contractor.

   E. The exact location of apparatus, equipment, and piping shall be ascertained from the Architect or the Architect’s representative in the field, and work shall be laid out accordingly. Should the Contractor fail to ascertain such locations the work shall be changed at Contractor's own expense when so ordered by the Architect. The Architect reserves the right to make minor changes in the location of piping and equipment up to the time of installation without additional cost.
F. It is the intention of the Drawings and Specifications that, where certain items such as unions, expansion joints, and other mechanical components are not shown, but where such items are required by the nature of the work, shall be furnished and installed.

G. The Fire Protection Drawings and Specifications are intended to supplement each other. Any material or labor called for in one shall be furnished even though not specifically mentioned in the other.

H. Pipe sizes shown are the minimum allowable and shall be increased in size if required by code or wherever necessary to meet unusual conditions.

3.2 RECORD DRAWINGS

A. Record Drawings shall be maintained at all times showing the exact location of piping mains, branches, valves, drains, etc. installed under all Sections. Obtain from the Architect, at cost, a complete set of prints. On these prints systematically and accurately keep a dimensional record of all work installed different from those shown on Drawings. Have these Drawings readily available for reference.

B. Record Set: When above information is complete and acceptable to the Architect transfer this information accurately to reproducible tracings, purchased at cost from the Architect for this purpose, and deliver to the Architect for final review.

C. Upon completion of the Architect's review of the Record Set the Contractor shall incorporate changes, as noted on the record set, including dimensions such as elevations, valves, etc. Deliver transparencies with one (1) set of prints to the Architect. Deliver one (1) complete set of prints to building Owner within ninety (90) days of issuance of final occupancy report.

D. Inspector's Approval: Where a full-time inspector is employed by the Owner, the Record Drawing information shall be reviewed by the inspector during the course of construction and shall have the inspector's approval before submission to the Architect.

3.3 ACCEPTANCE TESTS

A. Documentation on standard NFPA Acceptance forms and inspection documents shall be submitted to the Architect.

B. The required acceptance documents shall be signed by a licensed C-16 Contractor.

3.4 DAMAGE

A. Repair any damage to the building, premises, and equipment occasioned by the work under this Section.

B. Repair all damage to any part of the building or premises caused by leaks or breaks in pipe, or malfunctions of equipment furnished or installed under this Section until the warranty period expiration date.
3.5 COMPLETE WORKING INSTALLATION
A. The Drawings and Specifications do not attempt to list every item that must be installed. When an item is necessary for the satisfactory operation of equipment, is required by the equipment manufacturer, or accepted as good practice, furnish without change in Contract cost.

3.6 STORAGE
A. Provide proper protection and storage of all items and tools required for this work.

3.7 QUALITY OF WORK
A. The quality of work shall be of a standard generally accepted in the respective trade. Use only experienced, competent, and properly equipped workers. Replace work falling below this standard as directed by the Architect.
B. Systems shall be worked into a complete and integrated arrangement with like elements arranged to make a neat appearing and finished piece of work, with adequate head room and passageway free from obstructions. Such systems shall be installed by laborers experienced in the respective trades involved.

3.8 CONCRETE WALLS AND CONCRETE FOOTINGS
A. Where pipes must pass through concrete walls and footings, they shall pass through Schedule 40 galvanized pipe sleeves set in place at time of construction. The sleeves shall provide clearance in accordance with NFPA 13
B. Coordinate core drilled openings with Architect and General Contractor. Coordination shall include location, size, and spacing of openings. No slot openings will be allowed. Coordinate openings to avoid critical structural items such as reinforcing bars, tensioning tendons, etc.
C. Also see Paragraph 3.15.

3.9 ELECTRICAL REQUIREMENTS - CONTROLS AND COORDINATION WITH ELECTRICAL CONTRACTOR
A. The Fire Protection Contractor shall coordinate with the Electrical Contractor on furnishing and installing of controls, motors, starters, etc. Coordinate means informing Electrical Contractor of items requiring electrical connection, providing copies of submittal data, installation data, scheduling work to insure efficient progress, and promptly supplying those items to be installed by Electrical Contractor.
B. The specific requirements for electrical power and/or devices for each and every piece of fire protection equipment requiring electrical service, supplied and/or installed under this Contract, shall be coordinated and verified with the Fire Protection Drawings, Fire Protection Sections of these Specifications, and with the manufacturers of the equipment supplied. This shall include the voltage, phase, and ampacity; conduit requirements; and exact location and type of disconnect, control, and/or connection required. Any changes from the Drawings and Specifications required as a result of this coordination shall be part of this Contract.
C. Electrical Contractor shall furnish and install the following for all mechanical equipment:
1. Conduit and wiring for line voltage power to the equipment.
2. Disconnect switches.
4. Magnetic motor starters when part of a motor control center. See Division 16 and Drawings for further information.

D. The work under this Section shall include furnishing and installing all controls on low and manual line voltage, including thermostats, auxiliary switches, relay wiring, interlock wiring; equipment control panels and transformers; and controls conduit unless specifically indicated as part of other work. Materials and methods of the control installation shall be in accordance with the Electrical Specifications.

E. The Fire Protection Contractor shall review all wiring connections which have any influence on this equipment or work and verify that these connections are correct before permitting any equipment to be operated which is furnished, installed, or modified under this Contract.

3.10 ELECTRICAL REQUIREMENTS - MOTORS AND EQUIPMENT FURNISHED UNDER THIS SECTION

A. Motors and motor control equipment shall conform to the standards of the National Electrical Manufacturer's Association (NEMA). Motors and motor control equipment shall be as specified below. The work under this Section shall include:

1. Furnishing all motors, magnetic starters and automatic control devices for equipment furnished and installed by this Contractor. Electrical Contractor shall provide magnetic starters at motor control center where indicated.
2. Installation of the above motors and control devices. Manual motor starters shall be furnished and installed by Electrical Contractor in accordance with Electrical Specifications.
3. Furnishing and installing line and/or low voltage interlock wiring shall be by the Mechanical Contractor. Installation of wire includes the connection of devices. All work shall be in accordance with the materials and methods specified in the Electrical Specifications.
4. Furnishing and installing completely wired equipment control panels with complete controls for automatic operation where indicated or when supplied with equipment.
5. Furnishing and installing all control and interlock wiring from equipment control panels to related remote devices, fans, motors, heaters, and controls.
6. Wire mounted on heat producing appliances shall be Type RHH or THHN (90°C).
7. Except as noted above, disconnect switches, power circuits from electrical panelboard to disconnect switch, starters, and motors shall be furnished and installed under the Electrical Specifications.

3.11 ELECTRICAL EQUIPMENT ROOM PRECAUTIONS

A. Piping shall not be installed in any switchgear room, transformer vault, telephone room or electric closet except as indicated. In any case, no piping shall be installed in the space equal to the width and depth of any electrical service equipment, switchboards, panel boards, or motor control centers and extending from the floor to a height of six feet above the equipment or to the structural ceiling, whichever is lower. Only sprinkler piping serving the room may be installed in those rooms.
3.12 CUTTING AND REPAIRING

A. No cutting shall be done except with Architect’s approval. Cutting of structural members or footings is prohibited without the prior written consent of the Structural Engineer.

B. Where cutting of paving, walls, ceilings, etc. is necessary for the installation of the mechanical work, it shall be done under the direction of this Section. Damage caused by this cutting shall be repaired to match original and adjacent surfaces without additional expense to the Owner. Cutting of new construction shall be by the installing Contractor of that construction as directed by this Contractor.

3.13 PIPE AND VALVE IDENTIFICATION

A. Identify all piping contents with letter legend on color background identifying hazard or use of material.

B. The pipe marker system shall conform completely with "The Scheme for Identification of Piping Systems" (ANSI A13.1). More specifically, the pipe marker must possess the following:
   1. ANSI specified color coded background.
   2. ANSI specified color of legend in relation to background color.
   3. ANSI specified legend letter size.
   4. ANSI specified length of color field (marker length).

C. The following tables will serve to clarify the above mentioned requirements:

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<thead>
<tr>
<th>Outside Diameter of Pipe or Covering</th>
<th>Length of Color Field</th>
<th>Size of Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4” to 1 1/4”</td>
<td>8”</td>
<td>1/2”</td>
</tr>
<tr>
<td>1 1/2” to 2”</td>
<td>8”</td>
<td>3/4”</td>
</tr>
<tr>
<td>2 1/2” to 6”</td>
<td>12”</td>
<td>1 1/4”</td>
</tr>
<tr>
<td>8” to 10”</td>
<td>24”</td>
<td>2 1/2”</td>
</tr>
<tr>
<td>Over 10”</td>
<td>32”</td>
<td>3 1/2”</td>
</tr>
</tbody>
</table>

D. All pipes 3/4” I.D. and smaller shall be marked with 1 1/2” brass tags equivalent to valve tags.

E. Provide flow markers consisting of labels similar to pipe markers with a large black arrow printed on same background color to indicate direction of flow.

F. Place pipe marker and flow marker on each pipe on both sides of walls or floors through which pipes pass. Place markers adjacent to valves and fittings or branch take-off and for exposed piping locate markers to be clearly visible to person standing on floor, and at not over 30’ 0” intervals on all straight runs of pipe.
G. All valves under 3/4” I.D.: 18 gauge brass identification tags 1 1/2” in diameter with depressed 1/2” high black filled letters above 1/2” black filled numbers. Tags shall be fastened securely at specified locations. Valve tags shall show valve number, purpose, and normal condition (open or closed).

H. Tag Locations:
1. Adjacent to each valve and fitting except on plumbing fixtures and equipment.
2. At each branch and riser take-off.
3. At each pipe passage through wall, floor, and ceiling construction.
4. At each pipe passage to underground.
5. On all horizontal pipe runs, marked every 25’ 0”.

3.14 VALVE TAGS AND CHART
A. Furnish and install in each mechanical room a single typed valve chart identifying all valves with their respective tag numbers, size, manufacturer, model number, service, and indicating whether each valve is normally open or normally closed. Chart shall be mounted in a neat sheetmetal frame with glass front. The frame shall be arranged so that valve chart is removable. Provide three (3) additional copies of valve chart in maintenance manuals.

3.15 SLEEVES AND SEALING
A. Provide sleeves for all pipes passing through new floors, walls, partitions, and any other building construction, of adequate diameter to allow minimum clearance all around between sleeve and pipe as required by NFPA 13.

B. Lay out work prior to concrete forming. Reinforce sleeves to prevent collapse during forming and curing.

C. All floor sleeves required shall extend 1” above finished floor except through mechanical equipment room floors and shafts where sleeves shall extend 2” above finished floor level. Sleeves through roof shall extend 8” above roof. Wall sleeves shall be flush with face of wall unless otherwise indicated. Waste stacks using carriers shall have sleeves flush with floor and sealed.

D. Sleeves shall permit free thermal expansion of pipe without binding or contact with structure.

E. Do not support pipes by resting pipe clamps on floor sleeves. Supplementary members shall be provided so pipes are floor supported.

F. Special sleeves detailed on Drawings shall take precedence over this Section.

G. Pipe sleeves as scheduled below unless otherwise indicated:
1. Plaster or Drywall:
   Schedule 40 galvanized steel pipe.
2. Concrete or Masonry Walls and Concrete Bases:
   See Paragraph 3.8.
3. Waterproof membraned floors, walls, concrete pits, foundation walls, etc. as detailed or specified in other Sections.
3.16 SUPPORTS

A. All supports and bracing shall comply with NFPA 13.

B. All equipment and piping shall be mounted on, or suspended from, foundations and supports as specified and indicated, and seismically braced to structure.

C. Seismic restraints shall be provided in accordance with NFPA 13.

D. All piping and equipment shall be securely anchored to building structure as required by the Specifications, California Title 24, the California Building Code, and NFPA 13.

E. Earthquake restraints shall be capable of resisting the gravity lateral loads required by NFPA 13.

F. Supplemental Supports: Provide supplemental supports to span building structural elements as necessary for equipment foundations and supports. Provide Shop Drawings to Mechanical and Structural Engineers for approval prior to installation.

3.17 ACCESSIBILITY

A. General: Valves, pressure gauges, and indicating equipment or specialties requiring reading, adjusting, inspection, repairing, removal, or replacement shall be conveniently and accessibly located with reference to finished building. Gauges shall be installed to be easily read from floor.

B. Panels: No unions, flanges, valves, controls, or equipment shall be placed in a location that will be inaccessible after the system is complete. Access panels or doors shall be provided where required whether or not shown on Drawings.

C. Access Panels in Walls or Ceilings:
   1. Provide access panels in walls or ceilings where indicated and where required to provide access to valves, dampers, and other appurtenances. Panels shall be style as selected by Architect and as directed by wall or ceiling construction. Panel size shall be 24" x 24" unless indicated otherwise. Panels in acoustical barriers shall have same transmission loss as barrier. Panels in rated construction shall have same rating as construction in which installed.
   2. Door panels shall be no lighter than 14 gauge steel. Doors shall be equipped with concealed spring hinges and flush, screwdriver operated locks, except that key operated locks shall be used for all access doors in walls where door is within 6' 0" of floor. Locks for all key operated doors shall be keyed alike.
   3. Doors in ceramic tile surfaces shall be stainless steel or chrome plated. Doors in other finished surfaces shall be prime coated.

D. Equipment Spaces: Provide aisles between equipment and piping, electrical gear, etc. for complete service and inspection of equipment. Maintain minimum 6' 6" headroom in all access aisles. Maintain minimum 36" clearance at all service panels. Provide minimum clearances at electrical equipment per NEC. Provide 36" wide, 3/4" thick plywood covered catwalks in attics from access door to equipment.
3.18 TESTING

A. Test all piping, equipment, and systems as called for in the Specifications. Notify Architect and inspection authorities prior to testing so that they may be witnessed. Protect all personnel and equipment during testing. Where Specifications do not cover specific points or methods, conform to manufacturer's specifications.

3.19 EQUIPMENT

A. All equipment shall be accurately set and leveled. Supports shall be neatly placed and properly fastened. All equipment shall be fastened in place with bolts.

B. Keep all openings closed with plugs or caps to prevent entrance of foreign matter. Protect all piping, ductwork, fixtures, and equipment against dirt, water, chemical, or mechanical damage both before and after installation. Any equipment or apparatus damaged prior to final acceptance shall be restored to original condition or replaced at the Architect's discretion and at no additional cost to the Owner.

C. Start-Up: Equipment shall be adjusted, lubricated, aligned, etc. prior to start-up. Inspect each piece of equipment prior to start-up. Start each piece of equipment in accordance with manufacturer's directions and warranty requirements.

D. Finish: Protect all equipment and materials until in use. Any visible rust or corrosion shall be removed as directed prior to installation. All damaged factory painted finishes shall be cleaned and painted with manufacturer provided paint.

3.20 MANUFACTURER'S DIRECTIONS

A. Materials and equipment shall be installed in accordance with manufacturer's application and recommendations, requirements, and instructions, and in accordance with Contract Documents. Where manufacturer's instructions differ from those indicated or specified, they shall be brought to Architect's attention for resolution prior to equipment ordering and installation.

B. Where requirements indicated in Contract Documents exceed manufacturer's requirements, Contract Documents shall govern.

3.21 FURRING AND PIPE SPACES

A. Spaces provided in the design of the building shall be utilized and the work shall be kept within the furring lines established on the Drawings.

B. Layout: Maintain maximum head room under piping and equipment. Contractor to coordinate line locations with beams, windows, etc. to provide maximum clearance. From Drawings, ascertain heights of suspended ceilings and size of pipe shafts in which piping is concealed, and location and size of structural members in and adjacent to pipe shafts. Coordinate piping installation with ductwork, lighting, and other equipment. Ensure necessary clearances on trim plates at exposed penetrations of walls and floors. If sufficient room is not available above suspended ceiling or vertical shafts obtain clarification from Architect before work is started.
3.22 SEISMIC RERAINTS

A. General: All work, materials and methods used shall conform to the Drawings and Specifications. NFPA 13 Guidelines shall be followed when specific details are not shown on the Drawings. Anchorage of equipment for which specific details are not shown on the Drawings shall be adequate to resist the forces based on the required "CP" factor. Such anchorage shall be approved by the Architect, Structural Engineer.

B. All supports shall be in accordance with NFPA 13 and 2016 CBC.

C. Piping:
   1. Pipe bracing system shall conform to the Drawings and to Specification requirements hereinafter listed, or shall be a pre-approved manufacturer’s system such as Tolco Seismic Bracing System, or approved equal.
   2. The Contractor shall submit Shop Drawings indicating the location of all seismic braces and provide a legend giving load information and model specifications prior to installation. Such prearranged system shall conform to requirements of the Specifications.
   3. Brace all pipes with 2 1/2" I.D. and larger in accordance with NFPA 13.
   4. Transverse bracings at 40' 0" on center maximum (minimum of one brace per direction of run).
   5. Longitudinal bracings at 80' 0" on center maximum (minimum of one brace per direction of run).
   6. Transverse bracing for one pipe section may also act as longitudinal bracing for the pipe section connected perpendicular to it, if the bracing is installed within 24" of the elbow or tee and is connected to the largest pipe.
   7. Do not use branch lines to brace main lines.
   8. Provide flexibility in joints where pipes pass through building seismic or expansion joints or where rigidly supported pipes connect to equipment with vibration isolators.
   9. At vertical pipe risers, support the weight of the riser at a point or points above the center of gravity of the riser wherever possible. Provide lateral guides at the top and bottom of the riser and at intermediate points not to exceed 30' 0" on center.
  10. Provide large enough pipe sleeves through walls or floors to allow for anticipated differential movements.
  11. Do not fasten one rigid piping system to two dissimilar parts of the building that may respond in a different mode during an earthquake (e.g., a wall and a roof).
  12. Cast iron piping systems are included in these requirements.
  13. All trapeze hangers shall be braced.

3.23 CLEAN-UP

A. During the course of work under this Section, all rubbish, debris, surplus materials, tools, etc. resulting from this work shall be removed from work area and shall be disposed of off-site at the end of each working day. The Owner’s premises shall be left clean and in a condition acceptable to the Architect.

B. Clean all work installed under this Contract to satisfaction of Owner and submit documentation that each system has been cleaned and results witnessed by the Architect’s representative.
3.24 ENGRAVED NAMEPLATES
A. Furnish and install plastic laminated engraved nameplates in accordance with NFPA 13, the local Fire Marshal.

3.25 FINAL INSPECTION
A. The Contractor shall furnish the Architect with certificates of final inspection and approval from the inspection authorities having jurisdiction.

3.26 GUARANTEE
A. The Contractor shall guarantee the quality of all work and the quality of equipment and materials in accordance with the provisions of the General Conditions and Special Conditions. Should any defects occur during this period, the Contractor shall promptly repair or replace defective items as directed by the Architect, without cost to the Owner.

3.27 SITE VISITS BY ENGINEER
A. Engineer's responsibility is limited to normal construction support services only, consisting of office consultation, site visits, and reports to the Architect at appropriate stages of construction such as rough-in, pre-final, and final. All costs incurred by the Engineer for additional site visits or office work required to complete the project as the result of incomplete coordination or supervision by the Contractor or the Mechanical Sub-Contractor shall be paid for by the Contractor.

3.28 OPERATING AND MAINTENANCE MANUALS
A. Complete sets of bound instructions containing the manufacturer's operating and maintenance instructions in accordance with specification section 21 05 00 Overhead Fire Protection System:

B. Field Instructions: Upon completion of the work and at a time designated by the Owner the services of one or more competent Engineers shall be provided by the Contractor to instruct a representative of the Owner in the operation and maintenance of the systems. These field instructions shall cover all the items contained in the bound instructions and shall be of a sufficient length and detailed nature, in the Engineer's judgment, to insure safe and efficient operation.

- END OF SECTION -
PART 1 - GENERAL

1.1 GENERAL

A. The General Conditions, any Supplementary Conditions, Section 21 0000, Fire Protection General, and Division 1 are hereby a part of this Section as fully as if repeated herein.

1.2 SCOPE

A. Furnish all labor, materials, equipment and services required for and/or reasonably incidental to the completion of the complete hydraulic calculated sprinkler system per NFPA 13 and other governing agencies.

1.3 WORK INCLUDED IN THIS SECTION

A. Furnish all labor, materials, equipment and services required for and/or reasonably incidental to the completion of the following work:

1. Sprinkler riser sized by hydraulic calculation complete as detailed on the contract drawings.
2. Complete hydraulically calculated wet-pipe automatic fire sprinkler system through all portions of Roseland Library. The building is calculated with a Light Hazard, design area plus 100 gpm total combined hose flow.
3. Sprinkler heads and piping are required at all areas shown on Architectural and/or Structural Drawings.
4. Furnish and install alarm bell flow switch riser. See Drawing for location of riser. Alarm bell shall be located a minimum of 7'-0" above the ground.
5. Prime and finish painting of portions of the fire protection system as required by the Architect or Rating Agency. See also Division 09, Painting.
6. Conformance to all design requirements of the local Fire Marshal and the Rating Agency. Preparation of all required Shop Drawings and details for the approval and installation of the system.
7. Coordination of installation of electrical conduit for supervisory systems. Provide all contacts required.
8. Arranging for all required inspections by the local official and by the Rating Agency. Cost of all testing and of special inspections required by them.
1.4 RELATED WORK UNDER OTHER SECTIONS
A. The following work is not in the work under this Section, but is covered in other Sections.
   1. Installation and connection of the electrical conduit for supervisory systems as shown on the Electrical drawings.
   2. Installation of the fire alarm systems as shown on the Electrical drawings.
   3. Installation of the underground fire service.

1.5 CODE REQUIREMENTS
A. All work shall conform to the requirements of the applicable Federal, State and local building and safety codes, ordinances and regulations.
B. Special attention shall be given to local fire regulations and the regulations of the local fire department and building department.
C. Special attention shall be given to local rulings of the Rating Agency.
D. Nothing in this Specification or on the Drawings shall be construed as permitting a departure from any applicable Federal, State or local building and safety code, ordinance or regulation, or from any requirements of the local fire department, building department and/or Rating Agency.

1.6 RATING AGENCY
A. Whenever the words "Rating Agency" are used in this Specification, they shall mean the insurance underwriters.

1.7 SUB-CONTRACTOR QUALIFICATIONS
A. This Contractor must be a C 16 Contractor, licensed by the State of California Contractor's Licensing Board. No portion of the fire protection system (performed on the job site) shall be subcontracted.
B. All fire sprinkler installers shall be certified and registered in accordance with the Automatic Fire Extinguishing Systems Certification requirements of CCR, Title 19, Division 1, Chapter 5.5.

1.8 SUBMITTALS
A. Submit for review, within fifteen (15) days after signing contract, the required number of copies of a complete list of materials proposed for use, including sizes, capacities, etc. See Division 1 for requirements. This list includes:
   1. Sprinklers.
   2. Piping.
   3. Fittings.
   4. Hangers and Bracing.
   5. Pressure Gauges.
   6. Sprinkler Head Cabinet.
   7. Valves.
8. Check Valves.
10. Expansion Plate

B. Shop Coordination Drawings shall show all details and information required by NFPA 13, NFPA 14 and/or NFPA 24. In addition, all earthquake bracing (longitudinal and lateral) shall be shown. If unnecessary deviation from Drawings are made by Contractor which cause additional cost to the Owner, Contractor shall submit the changes to the Architect for compliance verification and the additional cost shall be borne by the Contractor.

C. Final Record Drawings shall be submitted in accordance with Paragraph A above and paragraph Record Drawings of this Section, showing exact dimensional locations of all underground piping and of all risers, mains and cross-mains.

D. On completion of the job, furnish the Architect with a copy of the "Contractor's Material and Test Certificate" (Part A and/or B), signed by the local Fire Marshal, and a copy of the Transmittal Letter sending the certificate to the Rating Agency.

1.9 DESIGN OF SYSTEM

A. The riser locations are shown on the Drawings. Any request for changes must be submitted to the Architect 48 hours prior to bid times for consideration.

B. All work shall be designed in accordance with the requirements of the Rating Agency, the latest editions of NFPA 13, 14, and 24 and the appropriate edition of the California Building Code and the California Fire Code (as modified by local ordinance or ruling).

C. Each building’s sprinkler system shall be hydraulically calculated for the hazards or commodity indicated in Section 1.4.

D. Calculations shall be based upon the water supply available at the connection with the City water main.

E. Calculations shall demonstrate the system has a design cushion of at least ten percent of the available static pressure, or as required by local authority if greater.

F. The Sprinkler Contractor shall refer to the Architectural, Structural, Mechanical, and Electrical Drawings and coordinate the system layout to not interfere with the arrangement of lighting fixtures, grilles, diffusers, ductwork, equipment and piping in the Building.

G. All piping shall be installed for routing as shown on Drawings, including cross-mains, if shown. Also, piping shall be installed as close as practical to the roof structure so as to provide the maximum possible clear height. Cross-mains shall follow the roof line (tight to the bottom of the beams, purlins or joints) so as to remain at an approximately constant distance from the roof throughout.

H. Fire protection system lines shall be designed so as to avoid all other utility lines, conduit and structural components shown on the Drawings. Fire protection system lines must give way to all gravity lines. Notify Architect if conflicts cannot be coordinated in the field.

I. Cutting structural members shall not be allowed, unless otherwise approved by the Structural Engineer or the Architect.
PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials shall be new and currently listed in the Underwriters’ Laboratories, Inc. Fire Protection Equipment List and shall be acceptable to Local Fire Marshal. Material that is pending approval shall not be acceptable.

B. Underground piping shall be installed in strict accordance with the manufacturer's installation guide.

C. Cast or ductile iron shall be installed to within 5’ 0” of building and under all footings and slabs.

D. Above ground piping to be ANSI/ASTM A135 electric resistance welded and seamless carbon steel pipe. 1 1/2 in. and smaller use Schedule 40 with threaded fittings, 2” and greater shall be welded or roll grooved, minimum wall thickness for 300 psi in accordance with Schedule 10 up to 5 in., 0.134 in. wall for 6 in. pipe, and 0.188 in. wall for 8 in. and 10 in. pipe.

E. Backfill shall be accomplished in strict accordance with the manufacturer's installation guide and the "Backfill" Section of these Specifications.

F. Overhead piping, fittings and hanger material shall conform to the requirements outlined in NFPA 13.

G. Chrome plated escutcheon plates shall be provided where sprinkler piping passes through walls, floors or ceilings.

H. The escutcheons shall be the same size throughout the building and shall match ceiling decor.

I. A metal box containing replacement sprinkler heads shall be mounted near the riser inside the building and shall contain at least 6 heads and at least 2 of each type of head installed in the building. Also included shall be one wrench for each type of head used in the building.

J. Bushings shall not be used unless specifically approved by the Architect.

K. Provide and install head guards on sprinkler heads in areas where they could be damaged (stairwells, mechanical rooms, electrical rooms, emergency generator rooms, etc.).

L. Water flow switches shall be furnished and installed where indicated on the Drawings. Flow switch shall be UL rated by Notifier or approved equal. Flow switches shall be CSFM approved. Each switch shall have minimum of two poles for 120 V operation.

M. Tamper-proof switches shall be 120 V tamper switches for each isolation and control valve in each area. Electrical wiring and annunciating. Tamper switches shall be CSFM approved.

N. Remote inspector’s Test station to be per NFPA 13, at location shown on Drawings. Test station to be provided with isolation valve and orifice equal to one sprinkler head flow, with drain to sanitary sewer.
2.2 HANGERS, INSERTS, AND SUPPORT

A. General: Provide hangers, brackets, supports, anchors and related appurtenances as required to support all piping and equipment provided under this Section. Piping and equipment supports shall conform to Local Fire Marshal approved drawings.

B. Piping supports shall conform to hanger details on Local Fire Marshal approved drawings and NFPA 13.

C. Manufacturers: Superstrut, Elden, Fee and Mason, Grinnell or approved equal.

D. Floor Supports: Provide, where required, necessary floor supports for piping and equipment. Supports shall be fabricated from structural members or shall be masonry piers.

E. Sway Bracing: Per NFPA 13, Local Fire Marshal approved drawings and details.

2.3 SPRINKLER VALVES

A. Manufacturer: Selection based on Stockham. Stockham, Kennedy, Walworth or Lunkenheimer, only, unless otherwise noted. All valves must be submitted and meet rating as scheduled below. No foreign manufactured valves shall be used.

B. Valve pressure not less than 175 PSIG, except drain valves.

C. Main Drain Valves: 2" Nibco T-301-W, bronze body and trip, UL

D. Riser Check Valve: Tyco CV-1 riser swing check valve.

E. Riser Control Valve: Tyco BFV-N indicating butterfly valve with two sets of factory spot (single pole double throw) switches.

F. Inspectors Test Valve: Tyco 1 1/4" model F350 test and drain valve with 5.6K test orifice, shut-off valve and visual flow indicator.

G. Gauges: 3 1/2", 0-300psi, Ashcroft type 1005P, XUL fire protection sprinkler service -gauge fitted with gauge valve shut-off, UL, FM approved.

2.4 HOSE VALVES

A. Hose Valve: FPPI Angled Hose Valve, 300 psi rated, 2 1/2"FNPT Inlet X 2 1/2" MNST hose thread outlet, with brass chain and cap or approved equal.

B. Hose Rack Assembly: Complete UL listed hose rack assembly complete with 75 feet of poly lined hose, 1 1/2" cast brass coupling, 1 1/2" UL listed industrial fog nozzle, 1 1/2" cadmium plated escutcheon, red enamel UL listed pin rack, and 1 1/2" cast brass nipple, Croker series 3000 hose rack assembly or approved equal.

2.5 SPRINKLER HEADS

A. Exposed Ceiling Construction: Exposed upright automatic glass bulb type, plain brass finish, equal to Tyco, TY-FRB.
B. Finished Ceiling: Contractor to check with Architect on color to have manufacturer paint cover plates.
   1. Concealed: Concealed pendent automatic glass bulb type, equal to Tyco, “Royal Flush II”.
   2. Recessed: Recessed pendent automatic glass bulb type, equal to Tyco, TY-FRB.
   4. Cooler/Freezer: Dry pendent, quick response, standard coverage, equal to Tyco, DS-1.

C. Sidewall Heads: Contractor to check with Architect on color to have manufacturer paint cover plates.
   1. Recessed horizontal sidewall automatic glass bulb type equal to Tyco, TY-FRB.

D. Special Heads, Combustible Concealed Space: Upright automatic glass bulb type, plain brass finish, equal to Tyco, CC3.

E. All heads, except as noted, to have temperature rating at 155°F. Set head at and around heating devices suitable under normal operation to eliminate false alarm by generated heat.

F. Submittal: Submit 2 of each type of sprinkler head, complete with canopy, for Architect’s review prior to ordering heads.

2.6 ALARM RELATED COMPONENTS

A. Electric Bell: Potter 10” PBA1210, UL, FM approved CSFM listed.

B. Horn Strobe: Potter SH-120 series strobe/horn, UL, weatherproof rated for outdoor use.

C. Flow Switch: Potter VSR vane type water flow alarm switch with retard, UL, FM approved, CSFM listed, with (2) single pole adjustable switches.

2.7 ACCESSORIES

A. Sprinkler Cabinet: Tyco 12 head cabinet part number P/N 1124.

B. Access Panel: 24” x 24” Croker FRPWB1865 fire rated access panel with 16 gauge steel door, continuous hinge and dry wall bead frame.

C. PRESSURE GAUGE

D. 3 1/2” 0-300psi Ashcroft type 1005P, XUL fire protection sprinkler service gauge fitted with gauge valve shut-off, UL, FM approved.

2.8 SEISMIC JOINT

A. Seismic Joint: Metraflex fire loop seismic loop joint MLUG80XX series sized as shown on the plans. Seismic joint shall allow for a minimum of +/- 4” of seismic movement.

B. EXPANSION PLATE
PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Prior to bid, visit the job site and familiarize with local conditions, including verification of the location of the existing utilities.

B. The contractor shall field verify existing conditions and provide accurate shop coordination drawings for coordination with other trades in accordance with Division 1.

C. All piping shall be installed in a manner acceptable to Local Fire Marshal.

D. All piping shall be pressure tested and flushed according to the procedures set forth in NFPA 13, NFPA 14, and NFPA 24, and witnessed by the General Contractor, and the Inspector of Record.

E. All equipment installed under this Contract shall be properly thrust blocked and earthquake braced. This Contractor shall be responsible for the proper design and installation of the equipment and for satisfying CSFM and the Architect that these requirements have been met. Drawings shall show locations of earthquake bracing, both lateral and longitudinal.

F. All equipment installed under this Contract shall be protected from external damage. This Contractor shall be responsible for the proper design and installation of the equipment, and for satisfying CFSM and the Architect that these requirements have been met. Shop Drawings shall show details of protective equipment.

G. The Contractor shall furnish and install all sleeves required for his/her work where it passes through concrete. If sleeves are not installed, all penetrations shall be core drilled. All penetrations shall be approved by the Architect before drilling.

H. This Contractor shall be responsible for any damage to other work caused by this installation or by leaks in the fire protection lines.

I. This Contractor shall be responsible for coordinating his/her work with the General, Electrical, Mechanical, and Plumbing Contractors, and with other trades.

J. All work shall be done in a neat and workmanlike manner. All heads to be located as shown in the fire protection ceiling plans, on center or quarter points of ceiling tiles unless otherwise noted. Location of sprinkler heads shall take note of obstructions.

K. Escutcheons shall not be permitted closer than 6" to T bar ceiling members if conflicts with lights or grilles do not permit the centering of the heads in the tiles. Architect shall have final approval on exact location of sprinkler heads. Escutcheons shall not be mounted closer than 6" to any other ceiling mounted device.
3.2 **TOOLS**

A. All special tools for proper operation and maintenance of the equipment provided under this Section shall be delivered to the Owner’s representative and a receipt requested for same.

3.3 **IDENTIFICATION**

A. Valves:
   1. Riser control valve and floor control valves shall be clearly identified in the Riser Room.

B. Piping Identification:
   1. Apply color-coded polyvinyl chloride pipe bands identifying service per Section 21 00 00.
   2. On exposed piping, apply bands at 20' 0" on centers at straight runs, at valve locations, and at points where piping enters and leaves a partition, wall, floor, or ceiling.
   3. On concealed piping installed above removable ceiling construction, apply bands in manner described for exposed piping.
   4. On concealed piping installed above non-removable ceiling construction, or in pipe shafts, apply bands at valves or other devices that are made accessible by means of access doors or panels.
   5. Apply bands at exit and entrance points at each piece of equipment.
   6. Band widths shall be 8" for pipes up to 10" diameter, and 16" for larger diameter piping. Letter heights stating service shall be pre-printed on band, 3/4" high for 8" bands and 1 1/4" high for 16" bands.
   8. Tags and bands shall be approved for this service.
   9. Where flexible sprinkler hose fittings are installed and supported by suspended ceilings, the ceiling shall meet ASTM C 635 and ASTM C 636. Additionally, a label limiting relocation of the sprinkler shall be provided on the anchoring component. (NFPA 13-10, 9.2.1.3.3.2 & 9.2.1.3.3.4).

3.4 **SPRINKLER DRAINS AND TEST CONNECTION**

A. Provide all necessary drain valves, drain risers, capped nipples, auxiliary piping, etc. as required to drain the system risers and mains, and all trapped portions of the system. Drain valves which are not connected to drain pipes leading to floor drains shall be hose end type.

B. Main drains and test connections shall be piped to sanitary sewer. Provide air gap at discharge location shown on the plans.

C. Provide all piping required to spill the drains and test connections to the floor, funnel or other drainage connections provided under the plumbing contract, or arrange with the plumbing trade to provide additional drainage facilities, in which case pay all charges related to the additional plumbing construction work.

3.5 **TAGS**

A. Provide all designated signs on shut-off valves, control valves, alarms, etc. as required by the agencies having jurisdiction.
3.6 TESTING

A. All sprinkler system piping must be hydrostatically tested for a period of two (2) hours in the presence of the Owner or his/her designee, and the Inspector of Record.

B. Hydrostatic tests shall be made not less than 200psi for 2 hours or 50psi above static pressure in excess of 150psi.

C. Leakage from any fittings may be corrected by tightening or replacement of defective materials only. Use of sealant materials is expressly prohibited and unacceptable to the Owner as a corrective measure.

D. Gauges used in testing shall be identified as to accuracy, or provided by Owner, at his/her option.

E. Blind flanges or inserts used for testing shall be placed in the system and removed from the system in the presence of the Owner or his/her designee. These devices shall be clearly marked and vividly painted to permit casual observance of their addition to the system.

3.7 RECORD DRAWINGS

A. Keep a current set of Record Drawings on the job at all times. These Drawings shall be updated as changes are made and shall be kept in the Construction Office. Also, see Special Conditions and Fire Protection General, Section 21 0000.

B. Keep a current set of Specifications and material lists, with catalog cuts, in the Construction Office at all times.

3.8 CLEAN-UP

A. Perform the work under this Section so as to keep affected portions of the site neat, clean and orderly at all times. Upon completion of the work under this Section, immediately remove all surplus materials, rubbish and equipment associated with or used in the performance of this work. Failure to perform such clean-up operations within 24 hours of notice by the Architect or General Contractor shall be considered adequate grounds for the work to be done by others at this Sub-Contractor's expense.

3.9 OPERATIONAL AND MAINTENANCE MANUALS

A. Four (4) complete sets of operational and maintenance (O&M) booklets shall be supplied to the Architect with Record Drawings. One (1) set shall be retained by the engineer of record.

B. O&M booklets shall be complete and include:
   1. System operation and maintenance instruction.
   2. Inspection and Testing Log.

- END OF SECTION -
PART 1 - GENERAL

1.1 GENERAL
A. The General Conditions, any Supplementary Conditions, Section 21 0000, Fire Protection General, and Division 1 are hereby a part of this Section as fully as if repeated herein.
B. Section Includes: Description of requirements for materials and installation of site utilities and related work as shown on Drawings and necessary to provide a complete and proper installation.
C. The work includes under this section consists essentially of, but not necessarily limited to installing new site utilities in areas indicated on Drawings.
D. Related work:
   1. Section 21 0000   Fire Protection General
   2. Section 21 0500   Overhead Fire Protection

1.2 SCOPE
A. Furnish all labor, materials, equipment and services required for and/or reasonably incidental to the completion of the following work:
   1. Connection to existing municipal main with minimum 6" diameter fire main.
   2. Minimum 6" fire main as shown on the drawings
B. Underground fire sprinkler mains from five feet outside of new buildings, minimum 6" diameter, complete with in-building riser ending at a flange 12" above finish floor, with a blank flange bolted on top. Risers shall be located as shown on the fire protection drawings.
C. Trenching and backfill for underground piping as shown on the fire protection drawings.
D. Backflow assembly, gate valves, post indicators, and fire department connections, and In-building riser located as shown on the fire protection drawings.

1.3 SUBMITTALS
A. Submit for review, within fifteen (15) days after signing Contract, the required number of copies of a complete list of materials proposed for use, including sizes, capacities, etc. See Division 1 for requirements. This list includes:
   1. Piping.
2. Fittings.
3. Valves
4. Tracer wire.
5. Warning tape.
6. In-Building Riser.
7. Polyethylene Wrap.
8. Mechanical Joint Restraint.
9. Backflow Assembly
10. Fire Department Connections
11. Fire Hydrants

1.4 COORDINATION

A. Before submitting a bid for the mechanical work the Contractor shall visit the site and become familiar with all the work on other related Drawings and Specifications, and plan his/her work to provide the best possible assembly of the combined work of all trades. No additional costs will be considered for work which has to be relocated due to conflicts with other trades.

1.5 BUILDING LAWS

A. Mechanical work shall conform to all requirements prescribed by governmental bodies having jurisdiction and is to be in accordance with the California Plumbing Code, California Mechanical Code, California Fire Code, National Fire Protection Association; California State Code Title 8, Title 21, and Title 24; and the Energy Conservation Standards.

B. Should any part of the design fail to comply with such requirements, the discrepancy shall be called to the attention of the Architect prior to submitting a bid.

C. Should there be any direct conflict between the Drawings and/or Specifications and the above rules and regulations, the rules and regulations shall take precedence. However, when the indicated material, workmanship, arrangement or construction is of a superior quality or capacity to that required by above rules and regulations, the Drawings and/or Specifications shall take precedence. Rulings and interpretations of enforcing agencies shall be considered a part of the regulations.

D. After a Contract is awarded, if minor changes or additions are required by the aforementioned authorities, even though such work is not shown on Drawings or overtly covered in the Specifications, they must be included at the Contractor’s expense.

E. The Contractor is responsible to coordinate and make adjustments in his/her work with the full set of Contract Drawings and Specifications.

1.6 PERMITS, FEES AND UTILITIES

A. The Contractor shall obtain and pay for all permits and fees. The Contractor shall arrange for all required inspections.
1.7 UTILITY CONNECTIONS

A. The Contractor shall route site utilities to approximately 5’ 0” outside of building, or as shown on Drawings.

1.8 MATERIALS AND WORKMANSHIP

A. All equipment provided shall deliver full rated capacity at efficiency for which designed. All equipment shall meet requirements indicated and be suitable for installation shown. Notify Architect of any shortcomings found at least ten (10) days prior to bid date. Equipment not meeting all specified requirements will not be accepted even though specified by name along with other manufacturers.

B. Where two or more units of the same class of equipment are furnished in the same Section of the Specification, provide each from the same manufacturer. Furnish all equipment and materials new and free from defects.

C. Capacities, dimensions or sizes specified or indicated are minimum. Tolerances used in rating or testing standards specified not allowed in determining capacities of equipment.

D. Materials and equipment shall be installed in accordance with the manufacturer’s application recommendations, requirements, and instructions, and in accordance with Contract Documents. Where manufacturer’s instructions differ from those indicated or specified, they shall be brought to Architect’s attention for resolution prior to equipment ordering and installation. Where requirements indicated in Contract Documents exceed manufacturer’s requirements, Contract Documents shall govern.

E. All non-metallic piping below grade shall have tracer wire and warning tape installed as part of this scope of work.

1.9 SITE CONDITIONS

A. Information on Drawings relative to existing conditions is approximate. During progress of construction, deviations found necessary to conform to actual conditions shall be reported to Architect for determination of procedure to be followed. Contractor is responsible for any damage caused to existing systems. Promptly notify Architect if utilities are found which are not indicated.

B. Existing equipment, piping, wiring, construction of City sidewalk, street, etc. which interferes with work of this Section shall be removed and promptly returned to service. Replace damaged items with new material to match existing. The City of Salinas and private utilities must be informed of property owned by them that has been damaged and replaced.

C. Remove materials not required for present or future use of facility and not claimed by Owner shall become the property of the Contractor and shall be removed from the premises. Consult Owner before removing any material from the premises. Materials claimed by the Owner shall be removed carefully to prevent damage and delivered on-site where directed.

D. Existing piping and wiring not reused and concealed in building construction may be abandoned in place, but all such piping and wiring which is exposed or indicated to be removed shall become the property of the Contractor and shall be removed from the premises.
E. Verify all dimensions, lines, and levels at the site for all work specified herein. All inverts, slopes, and elevations shall be established by instrument working from established datum. Provide elevation markers and lines for Owner's use in determining that slopes and elevations are in accordance with contract requirements. Accurately locate trenches in relation to building and boundary lines as indicated.

PART 2 - PRODUCTS

2.1 PIPING AND MATERIALS

A. Fire and sprinkler mains to 5'-0" from the building shall be Manville “Blue Brute” PVC, FM Class 200, DR14, “Certainteed” C900, or approved equal, with ringtite joint for 4” or larger. Lubricate per manufacturer's recommendations (see Thrust Block detail). For 3” and smaller, Schedule 40 PVC pipe with solvent joints (rated at 200 PSI fittings).

B. Tracer wire for all non-metallic piping shall be minimum size #10 AWG copper wire with U.L. approval for direct-burial with an insulating jacket of Yellow Color. Piping shall have a contiguous trace wire strapped to the pipe every 5 lineal feet and shall be accessible at every riser and in-grade valve box. Contractor shall provide both warning tape and trace wire for all underground piping.

C. All fire and sprinkler service materials shall be new and currently listed in the Underwriters’ laboratories, Inc. Fire Protection Equipment List and shall be acceptable to Local Fire Marshal. Material that is pending approval shall not be acceptable.

D. All underground piping shall be installed in strict accordance with the manufacturer’s installation guide.

E. Sprinkler mains shall be cast or ductile iron when installed to within 5'-0" of building and under all footings and slabs.

F. All metallic piping fittings shall be coated and wrapped. Metallic piping and fittings shall be polyethylene encased for corrosive soil conditions.

G. All bolt-up sets (nuts, bolts, and washers) and tie rods for valves, fittings and buries shall be stainless steel, ASTM A-276 Type 316.

H. Backfill shall be accomplished in strict accordance with the manufacturer’s installation guide and the “Backfill” Section of these Specifications.

I. Fire department connection shall be as follows:
   1. Body: 2 way Croker 6407.
   2. Inlet: 2-way – (2) 2 1/2”.
   3. Bottom Outlet: (1) 4”.

J. Finish: Rough Brass.

K. Identification: Branded, “AUTO-SPKR-STAND-PIPE”, or as required by fire department.

L. Provide check valve between fire main and fire department connection.

N. Double Check Detector Assembly: Ames 3000 SS standard orientation in accordance with City of Santa Rosa standards, complete with 5/8” x 3/4” bypass meter and trim. Size as indicated on the Drawings. The double check detector assembly shall have a maximum pressure drop of 3 psi at a 300 gpm flow rate.

O. Indicator Post: Kennedy style 2945A UL/ FM approved.

P. Tamper-proof witches shall be 120 V tamper switches for each isolation and control valve in each area. Electrical wiring and annunciating. Tamper switches shall be CSFM approved.

Q. In-Building Riser: Ames series IBR, 304 stainless steel, UL/FM approved.

R. Polyethylene Wrap: Minimum 8 mil polyethylene encasement in accordance with AWWA C105/A21.5-10. Christy’s Polyethylene Fitting Wrap 26 or approved equal.

2.2 VALVE BOXES

A. Valve boxes shall be of cast iron, screw adjustable type with loose cast iron cover as manufactured by M&H, Mueller, Iowa or Pacific States Cast Iron. Covers shall be lettered "Water" or as detailed and specified on Drawings.

2.3 THRUST BLOCKS

A. Provide concrete thrust blocks at all changes in direction of fire and fire sprinkler main. Minimum face area against undisturbed soil shall be 6 ft2 on water mains, or as indicated; 1/2” diameter rods shall be bent around pipe and anchored into 2000 lb strength concrete. Thrust blocks shall be provided in addition to mechanical joint restraint.

2.4 MECHANICAL JOINT RESTRAINT

A. Provide mechanical joint restraint at all changes in direction of the fire and fire sprinkler mains. Mechanical joint restraint for C900 PVC pipe shall be EBAA Iron Megalug series 2000PV or approved equal. Mechanical joint restraint for ductile iron pipe shall be EBAA Iron Meglug series 1100 or approved equal.

2.5 VALVES

A. All valves shall be the product of a single manufacturer, Mueller, Stockham, Kennedy or Clow. Valves shall be mechanical joint and be AWWA approved.

2.6 CHECK VALVES

A. Check valves shall be used when installing a fire department connection on the main.

2.7 FIRE HYDRANTS

A. The fire hydrants shall be Clow 865 wet barrel type with one two 4 ½” pumper and 1 2 ½” outlets in accordance with local standards.
PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Prior to bid, visit the job site and familiarize with local conditions, including verification of the location of the existing utilities.

B. All fire and sprinkler piping shall be installed in a manner acceptable to the local CFSM and the Rating Agency.

C. All fire and sprinkler piping shall be pressure tested and flushed according to the procedures set forth in NFPA 13, NFPA 14, and NFPA 24, and witnessed by the General Contractor and the Inspector of Record.

D. This Contractor shall be responsible for any damage to other work caused by this installation or by leaks in the fire protection lines.

E. This contractor shall be responsible for coordinating his/her work with the General, Electrical, Mechanical, and Plumbing Contractors, and with other trades.

F. EXCAVATION AND BACKFILL

G. Perform all necessary excavation and backfill required for installation of mechanical work. Any work damaged during excavation and backfilling shall be repaired at Contractor's expense.

H. Trenches are to be excavated to necessary depth and width. Provide additional excavation to facilitate crossovers, additional offsets, etc. as required. Excavation material is unclassified. Width of trench adequate for proper installation of piping.

I. Bedding shall be on minimum 6" deep layer of sand placed on leveled trench bottom. Sand removed to necessary depth for piping bells and couplings to maintain contact of pipe on sand for entire length. All other piping laid on smooth level trench bottom to maintain contact for entire length.

J. All backfill shall be bank run sand and/or gravel to 6" above piping up to slab on interior piping below slabs. All backfill placed in layers not exceeding 8" deep and compacted to 95% of maximum density at optimum moisture content per AASHO Standard T 99.

K. During progress of work, Owner may have compaction tests made under direction of testing laboratory for all compacted fill. If found not to meet Specification, Contractor shall excavate and recompact fill at no additional cost to Owner.

L. Following backfilling, grade all trenches to level of surrounding subgrade. All excess soil shall be located per Owner's instructions.

3.2 SETTING OF FIRE HYDRANTS, VALVES AND VALVE BOXES

A. Fire hydrants shall be located where indicated and installed as shown. Each hydrant shall be connected to the main with a 6" branch line with at least much cover as the distribution main. Hydrants shall be set plumb with the pumper nozzle facing the roadway or fire departments access route. The center of the lowest outlet shall be not less than 18" above the finished
surrounding grade, and the operating nut not more than 48" above the finished surrounding grade. Except where otherwise approved, the backfill around hydrants shall be thoroughly compacted to the finished grade line immediately after installation to obtain beneficial use of hydrant as soon as practicable. Provide thrust blocks in direction of flow. The hydrant shall be set upon a slab of concrete not less than 4" thick and 15 square inches (see thrust block detail).

B. Valves, after delivery, shall be drained to prevent freezing and shall have the interiors cleaned of all foreign matter before installation. Stuffing boxes shall be tightened and the hydrant or valve shall be fully opened and carefully closed to insure that all parts are in working conditions.

C. Thrust Blocks: Plugs, caps, tees, and bends deflecting 22 1/2° or more, either vertically or horizontally, on water lines 4" in diameter or larger and fire hydrants shall be provided with thrust blocking. Thrust blocking shall be concrete of a mix not leaner than 2 parts cement; 2 1/2 parts sand; 5 parts gravel; and having a compressive strength of not less than 2,000 PSI at 28 days. Blocking shall be placed between solid ground and the hydrant or fitting to be anchored. Unless otherwise indicated or directed, the base and thrust bearing sides of thrust blocks shall be poured directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be poured against forms. The area of bearing shall be as shown or as directed. Blocking shall be placed so that the fitting joints will be accessible for repair.

3.3 REQUIREMENTS OF REGULATORY AGENCIES

A. In addition to requirements shown or specified, comply in general with applicable portions of latest current local and/or State ordinances and codes.

B. Include all items of labor and material required to comply with such standards and codes. Where quantities, sizes or other requirements indicated are in excess of standard or code requirements, specified requirements shall govern.

3.4 COORDINATION

A. Do all work to receive or joint with work of all trades; cut new service into existing mains; extend piping; and make necessary connections as required to prevent interruption of service. All work shall be coordinated with work of other trades to provide clearances for installation and maintenance of all mechanical equipment. Drawings and Specifications are arranged for convenience only and do not necessarily determine which trades perform various portions of the work.

B. Before shutdown of any utility service for new connections, coordinate with and notify Owner, County, and utility company(s). Contractor to verify with Architect for approval for areas of interference with existing facilities and operation of departments before doing any work. Contractor to work out schedule of construction and get approval by Architect before starting any work.
3.5 DRAWINGS

3.6 Drawings are diagrammatic and do not show all offsets, bends, elbows, etc. which may be required for proper installation of work. Such work shall be verified by Contractor at building site. Provide additional bends and offsets as required by riser and main locations, or other conditions, to complete work at no additional cost to Owner.

3.7 Drawings and Specifications are complementary and what is called for by one shall be as binding as if called for by both. Items indicated are not necessarily included in Specifications. Specifications shall supersede Drawings in case of conflict.

3.8 TESTING

3.9 Test all piping, valves, clean-outs, etc. as listed below and provide the Architect with certified copies of test results. The inspection authority having jurisdiction and the supervising Architect shall be notified at least 24 hours prior to performance of all tests so that they may be witnessed.

3.10 All new fire main piping shall be hydrostatically tested to 200 PSI for 2 hours in the presence of the Local Fire Marshall and Inspector of Record.

- END OF SECTION -
DIVISION 22 – PLUMBING

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PART 1 - GENERAL

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

1.2 SUMMARY
A. Extent of Plumbing Work is shown on Drawings.

1.3 RELATED REQUIREMENTS
A. Section 01 5000 "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities, and temporary erosion and sedimentation control measures.
B. Section 01 7300 "Execution" for field engineering and surveying.
C. Plumbing Drawings.
D. Section 01 7419 "Construction Waste Management and Disposal."

1.4 REFERENCES

1.5 DEFINITIONS
A. Refer to Plumbing Drawings.

1.6 SUBMITTALS
A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.
B. Product Data: For each type of the following manufactured products required:
   1. Materials specific to scope of work including, but not limited to the following:
      a. Piping:
1) Pipe and fittings.
2) Joints and couplings.
3) Technical data and tested physical and performance properties.

2. All Other Products: Submit manufacturer’s standard drawings or catalog cuts.

C. CAL-GREEN Submittals:
   1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

D. Shop Drawings:
   1. Refer to Plumbing Drawings.

1.7 INFORMATIONAL SUBMITTALS

A. Material Certificates:
   1. Refer to Plumbing Drawings.
   2. Piping and appurtenances.

B. Coordination Drawings:
   1. Rainwater Leader Piping:
      a. Show pipe sizes, locations, and elevations.
      1) Refer also to Plumbing Drawings.

1.8 DELIVERY, STORAGE AND HANDLING

A. Refer to Plumbing Drawings.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS

A. Refer to Plumbing Drawings

2.3 MATERIALS

A. Refer to Plumbing Drawings.
PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine areas within scope of work for compliance with requirements and conditions affecting installation and performance.

3.2 PREPARATION
   A. Refer to Plumbing Drawings.

3.3 INSTALLATION
   A. Install Plumbing Work as indicated on Drawings and to comply with referenced codes and standards.

3.4 CLEANING AND CLEANUP
   A. Clean interior of piping of dirt and superfluous materials.
      1. Flush with water.

3.5 PROTECTION
   A. Protect completed Plumbing Work as indicated on Drawings and as required to prevent damage until acceptance.

3.6 WASTE MATERIALS AND HANDLING
   A. Remove surplus material and legally dispose off Owner’s property.
      1. Handle waste material according to approved waste management plan.
      2. Refer to Section 01 7419 “Construction Waste Management and Disposal.”

- END OF SECTION -
DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING

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PART 1 - GENERAL

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

1.2 SUMMARY
A. Extent of Heating, Ventilating and Air Conditioning is shown on Drawings.

1.3 RELATED REQUIREMENTS
A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

1.4 REFERENCES
C. Standards and Codes referenced on the Drawings.

1.5 DEFINITIONS
A. Refer to Mechanical Drawings.

1.6 SUBMITTALS
A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.
B. Product Data: For each product required, demonstrate compliance with specified attributes:
   1. Technical data and tested physical and performance properties.
C. CAL-GREEN Submittals:
1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

D. Samples for Selection: For the following products:
   1. Materials requiring color or texture selection: Full range of available colors and textures.

E. Samples for Verification: For the following products, in sizes indicated below:
   1. Materials Requiring Color or Texture Selection: One unit or module in selected color / texture, or size as approved by Architect.

**PART 2 - PRODUCTS**

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS

A. Refer to Drawings.

2.3 MATERIALS

A. Provide materials as indicated on Drawings.

**PART 3 - EXECUTION**

3.1 INSTALLATION

A. Install mechanical improvements as indicated on Drawings and to comply with referenced codes and standards.

3.2 PROTECTION

A. Protect completed mechanical improvements as indicated on Drawings and as required to prevent damage until acceptance.

3.3 WASTE MATERIALS AND HANDLING

A. Remove surplus material and legally dispose off Owner’s property.
   1. Handle waste material according to approved waste management plan.
   2. Refer to Section 01 7419 “Construction Waste Management and Disposal.”
## DIVISION 26 – ELECTRICAL

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DTR Consulting Services, Inc.

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PART 1 - GENERAL

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

1.2 SUMMARY
A. Extent of Electrical is shown on Drawings.

1.3 RELATED REQUIREMENTS
A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

1.4 REFERENCES
A. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green."
C. Standards and Codes referenced on the Drawings.

1.5 DEFINITIONS
A. Refer to Electrical Drawings.

1.6 SUBMITTALS
A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.
B. Product Data: For each product required, demonstrate compliance with specified attributes:
   1. Technical data and tested physical and performance properties.
C. CAL-GREEN Submittals:
1. Product Data – VOC Limits: For adhesives, sealants, fillers and primers, documentation including printed statement of VOC contents, comply with limits specified in Section 01 6116.

D. Samples for Selection: For the following products:
   1. Materials requiring color or texture selection: Full range of available colors and textures.

E. Samples for Verification: For the following products, in sizes indicated below.
   1. Materials Requiring Color or Texture Selection: One unit or module in selected color / texture, or size as approved by Architect.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
   A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS
   A. Refer to Drawings.

2.3 MATERIALS
   A. Provide materials as indicated on Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION
   A. Install electrical improvements as indicated on Drawings and to comply with referenced codes and standards.

3.2 PROTECTION
   A. Protect completed Electrical Work as indicated on Drawings and as required to prevent damage until acceptance.

3.3 WASTE MATERIALS AND HANDLING
   A. Remove surplus material and legally dispose off Owner’s property.
      1. Handle waste material according to approved waste management plan.
      2. Refer to Section 01 7419 “Construction Waste Management and Disposal.”
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GENERAL PROVISIONS FOR EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Extent of Earthwork Improvements is shown on Drawings.

1.3 RELATED REQUIREMENTS

A. Section 01 5000 "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities

B. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.

C. Section 01 7300 "Execution" for field engineering and surveying.

D. Division 01 Section pertaining to construction site cleaning.

E. Section 01 7419 "Construction Waste Management and Disposal."

F. Section 01 8113 “Sustainable Design Requirements.”

G. Section 32 0200 “General Provisions for Exterior Improvements.”

H. Section 32 1316 “Decorative Cement Concrete Paving” for integral colored site concrete.

I. Section 33 0200 “General Provisions for Utilities.”

1.4 REFERENCES


D. Standards and Codes references on the Drawings.

E. Geotechnical Report, refer to Section 02 3200 "Subsurface Investigation."

1.5 DEFINITIONS

A. Refer to Civil Drawings.

1.6 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.

B. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

C. Product Data: For each product required, demonstrate compliance with specified attributes:
   1. Technical data and tested physical and performance properties.

D. Shop Drawings: Dewatering plans, sections, elevations, etc.

E. Samples for Selection: For the following products.
   1. Materials Requiring Color or Texture Selection: Full range of available colors and textures.

F. Samples for Verification: For the following products, in sizes indicated below.
   1. Materials Requiring Color or Texture Selection: One unit or module in selected color / texture, or size as approved by Architect.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
   1. Classification.
   2. Laboratory compaction curve.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Earth Moving operations.
   1. Submit before earth moving begins.

D. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
   1. Use sufficiently detailed photographs or videotape.

GENERAL PROVISIONS FOR EARTHWORK

31 0200 - 2
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

E. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.8 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner’s property, cleared materials shall become Contractor’s property and shall be removed from Project site.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 016116.

2.2 MANUFACTURERS

A. Refer to Drawings.

2.3 MATERIALS

A. Provide materials as indicated on Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install Exterior Improvements as indicated on Drawings and to comply with referenced codes and standards.

3.2 PROTECTION

A. Protect completed Exterior Improvements as indicated on Drawings and as required to prevent damage until acceptance.

3.3 WASTE MATERIALS AND HANDLING

A. Remove surplus material and legally dispose off Owner’s property.

1. Handle waste material according to approved waste management plan.

2. Refer to Section 01 7419 “Construction Waste Management and Disposal.”
# DIVISION 32 – EXTERIOR IMPROVEMENTS

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EXTERIOR IMPROVEMENTS

DIVISION 32
PART 1 - GENERAL

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

1.2 SUMMARY
   A. Extent of Exterior Improvements is shown on Drawings.

1.3 RELATED REQUIREMENTS
   A. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
   B. Section 01 7300 "Execution" for field engineering and surveying.
   C. Division 01 Section pertaining to construction site cleaning.
   D. Section 01 7419 "Construction Waste Management and Disposal."
   E. Section 31 0200 “General Provisions for Earthwork.”
   F. Section 33 0200 “General Provisions for Utilities.”

1.4 REFERENCES
   D. Standards and Codes references on the Drawings.
1.5 **DEFINITIONS**

A. Refer to Civil and Landscape Drawings.

1.6 **SUBMITTALS**

A. General: Submit in accordance with Section 01 3300.

B. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

C. Product Data: For each product required, demonstrate compliance with specified attributes:
   1. Technical data and tested physical and performance properties.

D. Samples for Selection: For the following products.
   1. Materials Requiring Color or Texture Selection: Full range of available colors and textures.

E. Samples for Verification: For the following products, in sizes indicated below:
   1. Materials Requiring Color or Texture Selection: One unit or module in selected color / texture, or size as approved by Architect.

**PART 2 - PRODUCTS**

2.1 **PERFORMANCE REQUIREMENTS**

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in Section 01 6116.

2.2 **MANUFACTURERS**

A. Refer to Drawings.

2.3 **MATERIALS**

A. Provide materials as indicated on Drawings.

**PART 3 - EXECUTION**

3.1 **INSTALLATION**

A. Install Exterior Improvements as indicated on Drawings and to comply with referenced codes and standards.
3.2 PROTECTION

A. Protect completed Exterior Improvements as indicated on Drawings and as required to prevent damage until acceptance.

3.3 WASTE MATERIALS AND HANDLING

A. Remove surplus material and legally dispose off Owner’s property.
   1. Handle waste material according to approved waste management plan.
   2. Refer to Section 01 7419 “Construction Waste Management and Disposal.”

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- SECTION 33 0200 -

GENERAL PROVISIONS FOR UTILITIES

PART 1 - GENERAL

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

1.2 SUMMARY
   A. Extent of Utilities Work is shown on Drawings.

1.3 RELATED REQUIREMENTS
   A. Section 01 5000 "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities.
   B. Pertinent Sections specifying Volatile Organic Compound (VOC) Content Restrictions.
   C. Section 01 7300 "Execution" for field engineering and surveying.
   D. Division 01 Section pertaining to construction site cleaning.
   E. Section 01 7419 "Construction Waste Management and Disposal."
   F. Section 02 3200 “Subsurface Investigation”.
   G. Pertinent sections specifying Fire Suppression.
   H. Section 31 0200 “General Provisions for Earthwork.”
   I. Section 32 0200 “General Provisions for Exterior Improvements.”

1.4 REFERENCES

D. Standards and Codes references on the Drawings.

1.5 DEFINITIONS

A. Refer to Civil Drawings.

1.6 SUBMITTALS

A. Provide complete submittals at the same time as submittals for work in related sections to permit review of complete and integrated systems and assemblies.

B. Product Data: For each product required, demonstrate compliance with specified attributes:
   1. Technical data and tested physical and performance properties.

C. Samples for Selection: For the following products:
   1. Materials Requiring Color or Texture Selection: Full range of available colors and textures.

D. Samples for Verification: For the following products, in sizes indicated below:
   1. Materials Requiring Color or Texture Selection: One unit or module in selected color / texture, or size as approved by Architect.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. VOC limits for adhesives, sealants, fillers, primers, and coatings. Comply with limits specified in related Section.

2.2 MANUFACTURERS

A. Refer to Drawings.

2.3 MATERIALS

A. Provide materials as indicated on Drawings.
PART 3 - EXECUTION

3.1 INSTALLATION
   A. Install Utilities Work as indicated on Drawings and to comply with referenced codes and standards.

3.2 PROTECTION
   A. Protect completed Utilities Work as indicated on Drawings and as required to prevent damage until acceptance.

3.3 WASTE MATERIALS AND HANDLING
   A. Remove surplus material and legally dispose off Owner’s property.
      1. Handle waste material according to approved waste management plan.
      2. Refer to Section 01 7419 “Construction Waste Management and Disposal.”

- END OF SECTION -