

August 26, 2016
Issued for Construction

Project Specifications
Vertex Pharmaceuticals
Annex PAT Lab

Vertex Pharmaceuticals
50 Northern Ave
Boston, MA 02210

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Project Number: 179.07.00

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Division Section Title

DIVISION 01 - GENERAL REQUIREMENTS

01 1000	SUMMARY
01 2200	UNIT PRICES
01 2500	SUBSTITUTION PROCEDURES
01 2600	CONTRACT MODIFICATION PROCEDURES
01 3100	PROJECT MANAGEMENT AND COORDINATION
01 3200	CONSTRUCTION PROGRESS DOCUMENTATION
01 3300	SUBMITTAL PROCEDURES
01 7300	EXECUTION
01 7419	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 7700	CLOSEOUT PROCEDURES
01 7823	OPERATION AND MAINTENANCE DATA
01 7839	PROJECT RECORD DOCUMENTS
01 7900	DEMONSTRATION AND TRAINING

DIVISION 02 - EXISTING CONDITIONS

02 4119	SELECTIVE STRUCTURE DEMOLITION
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DIVISION 05 - METALS

05 5000	METAL FABRICATIONS
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DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 1053	MISCELLANEOUS ROUGH CARPENTRY
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DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 8413	PENETRATION FIRESTOPPING
07 9200	JOINT SEALANTS

DIVISION 08 - OPENINGS

08 1213	HOLLOW METAL FRAMES
08 3113	ACCESS DOORS AND FRAMES
08 4243	MANUAL TELESCOPING ENTRANCES
08 7100	DOOR HARDWARE
08 8000	GLAZING

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DIVISION 09 - FINISHES

09 2216	NON-STRUCTURAL METAL FRAMING
09 2900	GYPSUM BOARD
09 5113	ACOUSTICAL PANEL CEILINGS
09 6513	RESILIENT BASE AND ACCESSORIES
09 9123	INTERIOR PAINTING

MEPFP Specifications included on drawings

END OF TABLE OF CONTENTS

SECTION 01 1000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Work under separate contracts.
5. Access to site.
6. Coordination with occupants.
7. Work restrictions.
8. Specification and drawing conventions.
9. Miscellaneous provisions.

1.2 PROJECT INFORMATION

A. Project Identification: Vertex Pharmaceuticals, Annex Building Level 1 PAT Lab

1. Project Location: 1 Harbor Street, Boston, MA

B. Owner: Vertex Pharmaceuticals, 50 Northern Avenue, Boston, MA 02210

1. Owner's Representative: Wayne McFarland

C. Architect: Isgenuity, LLC. 321 Summer Street, Suite 401, Boston MA, 02210

1.3 WORK COVERED BY CONTRACT DOCUMENTS

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

- B. Roughly 900 sf renovation of open warehouse area to create new laboratory space. The program includes a new open lab area with casework, and a downflow booth (booth provided and installed by others). The renovations will be constructed to meet current code requirements and to comply with the ADA. The scope of work includes new mechanical, electrical, plumbing and fire protection services, clean utilities, structural slab trenching and infill, interior partitions, doors, finishes, and lighting.

1.4 PHASED CONSTRUCTION

- A. The Work shall be conducted in a single phase, however portions of the work must occur after the downflow booth installation (booth provided and installed by others). This includes wiring

of power and data outlets within the downflow booth, installation of manual sliding doors, and final balancing of the project.

1.5 WORK UNDER SEPARATE CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

1.6 ACCESS TO SITE

- A. General: 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. Use of Site: Limit use of Project site to work in areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Take precautions to ensure no disturbance of manufacturing and testing facilities occur under any circumstances.
- 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.

1.7 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 - 2. Provide not less than 96 hours' notice to Owner of activities that will affect Owner's operations.

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, 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 four 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 Architect and Owner not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products and other controlled substances within the existing building and on Project site is not permitted.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 1000

SECTION 01 2200 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.2 DEFINITIONS

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

1.3 PROCEDURES

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price No. 1 – Penetration Fire Stopping

1. Description: Include a unit price for Penetration Fire Stopping to Fire Stop existing slab penetrations that are not fire stopped that are uncovered during construction according to Division 078413 Section Penetration Fire Stopping to provide 2 hour rating
2. Unit of Measurement: Will be for a single 8" diameter hole in 5" thick concrete floor slab with 4" diameter pipe penetration.

B. Unit Price No. 2 – Gypsum Board Wall Assemblies

1. Description: Include a unit price for Gypsum Board Wall Assemblies for standard Type "B" Partition including all beads, taping, corners, joint compound and finish level to receive paint finish according to Division 092900 Section Gypsum Board
2. Unit of Measurement: Will be Per Square Foot

C. Unit Price No. 3 – Gypsum Board Soffit Assemblies

1. Description: Include a unit price for Gypsum Board Soffit Assemblies for standard 1'-0" Wide Ceiling Soffit with a 6" exposed vertical face on two sides including all beads, taping, corners, joint compound and finish level to receive paint finish according to Division 092900 Section Gypsum Board
2. Unit of Measurement: Will be Per Square Foot

D. Unit Price No. 4 – Painting

1. Description: Include a unit price for Painting for standard gypsum wall Partition and ceiling soffit according to Division 099123 Section Interior Painting.
2. Unit of Measurement: Will be Per Square Foot

E. Unit Price No. 5 – Sheet Metal Access Doors

1. Description: Include a unit price for supply and installation of a 2'-0" x 2'-0" Duct Access Door to existing sheet metal duct for purposes of cleaning according to Division 233100 Section Sheet Metal Work and Accessories.
2. Unit of Measurement: Will be Per Access Door

F. Unit Price No. 6 – Temporary Construction Barriers

1. Description: Include a unit price for Temporary Construction Barrier for 3-5/8" Metal Stud and two layers of Type X gypsum Board. Include Taping and Painting of Partitions.
2. Unit of Measurement: Will be Per Square Foot

G. Unit Price No. 7 – Electrical Outlets

1. Description: Provide unit pricing for material and installation of individual electrical outlets according to Division 26 Section "Electrical."
2. Unit of Measurement: Single duplex and quad outlet.

H. Unit Price No. 8 - Additional Junction Box and Conduits

1. Description: Provide unit pricing for material and installation of additional junction boxes and conduit according to Division 26 Section "Electrical."
2. Unit of Measurement: Individual units.

END OF SECTION 01 2200

SECTION 01 2500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 DEFINITIONS

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

1.3 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.
 - 1. Substitution Request Form: Use CSI Form 13.1A facsimile of form provided in Project Manual.
 - 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.
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 through Construction Manager 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.
- a. Forms of Acceptance: Bulletin, Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 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.

PART 2 - PRODUCTS

2.1 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: Architect will consider Contractor's request for substitution when the following conditions are satisfied:

- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution will not adversely affect Contractor's construction schedule.
 - c. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - d. Requested substitution is compatible with other portions of the Work.
 - e. Requested substitution has been coordinated with other portions of the Work.
 - f. Requested substitution provides specified warranty.
 - g. 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 60 days after the Notice to Proceed.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
- a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Requested substitution provides sustainable design characteristics that specified product provided for achieving LEED prerequisites and credits.
 - 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 3 - EXECUTION (Not Used)

END OF SECTION 01 2500

SECTION 01 2600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections:
 - 1. Division 01 Section "Allowances" for procedural requirements for handling and processing allowances.
 - 2. Division 01 Section "Unit Prices" for administrative requirements for using unit prices.

1.2 BULLETINS

- A. Bulletins, General: The Architect may prepare and issue Bulletins to document clarification of Work or changes in the Work.
- B. Clarifications: For the purpose of clarifying the Contract Documents, the Architect will prepare and issue Bulletins containing supplemental instructions regarding the Work, not involving adjustment to the Contract Sum or Contract Time.
- C. Minor Changes in the Work: For the purpose of addressing minor changes to the Contract Documents, the Architect will prepare and issue Bulletins containing supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time.
- D. Owner-Initiated Proposal Requests. For any proposed change in the Work that will require adjustment to the Contract Sum and Contract Time, the Architect will issue a Bulletin containing a detailed description of the required changes. If necessary, the description will include supplemental or revised Drawing and Specifications. Bulletins of this type issued by the Architect are for information only unless specifically designated as Construction Change Directives.
 - 1. Work Change Bulletin issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 14 calendar days after receipt of Work Change Bulletin, 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. Contractor Response to Bulletins: Upon receipt of a Bulletin, the Contractor shall review it promptly.
 - 1. If the Contractor determines that the Bulletin represents a clarification to the Contract Documents or a minor change in the Work, the Contractor shall proceed with the work described in the Bulletin.
 - 2. If the Contractor determines that the Bulletin represents an adjustment to the Contract Sum and/or Contract Time, the Contractor shall not proceed with the work described in the Bulletin, unless specifically authorized to do so in writing. In this case, the Contractor shall submit to the Architect a detailed estimate for the Owner's review, in accordance with the following.
 - a. Include a list of quantities and products required and unit costs, with the total amount of purchased to be made. Where requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Indicate a statement indicated the effect the proposed change in the Work will have on the Contract Time.

1.3 CHANGE ORDER PROPOSAL REQUESTS

- A. Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect through Construction Manager or General Contractor.
 - 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 Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

- B. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

1.4 ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Unit-Price Adjustment: See Division 01 Section "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within 21 calendar days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 21 calendar days after such authorization.
 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.6 CHANGE ORDER PROCEDURES

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

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive via Bulletin. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2600

SECTION 01 3100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination drawings.
 - 2. Requests for Interpretation (RFIs).
 - 3. Project Web site.
 - 4. Project meetings.
- B. Related Requirements:
 - 1. See Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

- A. RFI: 'Request for Interpretation'. Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.
- B. Building Information Model (BIM): Digital data files containing a three-dimensional model based technology linked with a database of project information.

1.3 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

- A. Contract Documents are intended to be reviewed as a whole (Contracts, drawings, specifications, supplemental information). Since the Contract Documents are complementary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Drawings and other Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, any errors, inconsistencies, irregular quantities or sizes or omissions discovered by the Contractor shall be reported promptly to the Architect as a request for information (RFI).
- B. Where Drawings or Specifications do not conform with manufacturer's recommendations or to applicable codes and standards, submit RFI before proceeding with related portion of the Work.

- C. It is the intent of the Contract Documents to require provision of systems and components that are fully complete and operational and fully suitable for intended use. Where the Contract Documents do not contain information to precisely describe a certain component or subsystem, or the routing of a component or its coordination with other portions of the Work, provide the specific component or subsystem with all parts necessary for the intended use, fully complete and operational, coordinated with other portions of the Work, and installed either concealed or exposed in accordance with the design intent.
- D. When discrepancies over size, material, finishes or quantities occur within the overall Contract Documents, submit RFI to the Architect before proceeding with related portions of the work for clarification of discrepancy.

1.4 CONTRACT DOCUMENTS

- A. Listing of Drawings and Specification Sections shall not limit responsibility for performing full extent of work required by the Contract Documents. Refer to all Contract Documents for coordinating each portion of The Work.
- B. Except where modified by a specific notation to the contrary, it shall be understood that the indication or description of any item, in the Drawings or Specifications, or both, carries with it the instruction to furnish and install the item, regardless of whether or not this instruction is explicitly stated as part of the indication or description.
- C. Items referred to in singular number in Contract Documents shall be provided in quantities necessary to complete The Work.
- D. Drawings are diagrammatic and are not intended to be absolutely precise; they are not intended to show every detail view, alignment, physical location, configuration, offset, pull-box, junction box, fitting, flashing, sealant, blocking, accessory, and component. The purpose of the Drawings is to indicate a systems concept, the main components of the systems, and the approximate geometrical relationships. Based on the systems concept, the main components, and the approximate geometrical relationships, provide all other components and materials necessary to make the systems fully complete and operational.
- E. Work required by any one Drawing or by any one Specification Section, but not indicated on other Drawings or within other Specification Sections, shall be binding as if required by all.
- F. Exact location of receptacles, light fixtures, exit signs, fire alarm devices, and other devices shall be coordinated with the Architectural Drawings and shall not be scaled from locations indicated on the Mechanical and Electrical Drawings.

1.5 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. Use CSI Form 1.5A. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

1.6 GENERAL COORDINATION PROCEDURES

- A. Use of BIM: Coordination of all building systems and trades are required to be completed in BIM. Contractors are required to submit systems models for coordination including information regarding existing conditions and coordination with adjacent trades. All conflicts shall be resolved within BIM coordination before fabrication and installation.
- B. 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 with other contractors 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.
- C. 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.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors 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.

- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.7 COORDINATION DRAWINGS

- A. Provide Ceiling Coordination drawings for open office area, including MEPFP systems, existing structure to remain, and architectural ceiling systems (Decorative Acoustical Clouds and support framing).
- B. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, for maximum utilization of space, for efficient installation of different components, and where 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. Prepare plans, 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. Obtain information from Owner as necessary for coordination with work under separate contracts. Include relevant separate contract information obtained from Owner on coordination drawings.
 - d. 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.
 - e. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation
 - f. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - g. Show acoustical ceiling grid and locations of visible ceiling-mounted devices relative to acoustical ceiling grid.
 - 2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 - 3. Number of Copies: Submit Digital Copies of submittal to review. If this is not possible, Submit two opaque copies of each submittal. Architect will return one copy.
- C. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show existing items to remain after field verification of the existing conditions. Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to architectural ceiling systems.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
3. Mechanical and Plumbing Work: Show the following:
 - a. Items as specified in Division 22 section "Basic Plumbing Materials and Methods", Division 23 section "Basic Mechanical Materials and Methods", and Division 25 section "Basic Materials and Methods".
 - b. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - c. Dimensions and locations of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - d. Fire-rated enclosures around ductwork.
4. Electrical Work: Show the following:
 - a. Items as specified in Division 26 section "Basic Materials and Methods".
 - b. Runs of vertical and horizontal conduit 1-1/4 inch diameter and larger.
 - c. Light fixture, exit light, emergency battery pack, smoke detector, and other fire alarm locations.
 - d. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - e. Location of pull boxes and junction boxes dimensioned from column center lines.
5. Fire Protection System: Show the following:
 - a. Items as specified in Division 21 section "Basic Fire Protection Materials and Methods".
 - b. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
6. Exact locations and groupings of mechanical, electrical and fire protection fixtures, switches, heads and outlets shall be obtained from the Architect before the Work is roughed in. Work installed without such information from the Architect shall be relocated at the Contractor's expense if the Architect so requests.
7. Indicate required installation sequences.
8. Indicate dimensions, ceiling height elevations, and alignments shown on the Contract Drawings and make specific note of dimensions and elevations that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
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 the Contractor's responsibility. If the Architect determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Architect will so inform the Contractor, who shall make changes as directed and resubmit.

10. Coordination Drawing Prints: Prepare coordination drawing prints in accordance with requirements of Division 01 Section "Submittal Procedures."
 11. Coordination Drawing Digital data Files: Prepare coordination drawing digital data files in accordance with requirements of Division 01 Section "Submittal Procedures."
 12. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
- D. 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, on project web site, and by each temporary telephone. Keep list current at all times.

1.8 FIELD MEASUREMENTS

- A. Field Measurements: Verify measurements at the building prior to creating coordination drawings, ordering materials, or commencing work. No extra charge or compensation will be allowed because of differences between actual dimensions and measurements indicated on the Drawings. Differences which may be found shall be submitted to the Architect for decision before proceeding with the work.
- B. Field Measurements for Fixed Equipment: Dimensions for fixed equipment to be supplied under this Contract or separate contracts shall be determined by field measurements taken jointly by the Contractor and the equipment supplier involved. A record of the field measurements shall be kept until time of substantial completion of the project, or until the equipment has been fully installed and accepted by the Owner, whichever is later. Responsibility for fixed equipment fabricated accurately to field measurements for proper fit and operation shall be that of the Contractor. Contractor shall pay all costs involved in correcting any misfitting fixed equipment as fabricated.

1.9 MODIFICATIONS IN LAYOUT

- A. Drawings are diagrammatic. They indicate general arrangements of each portion of the Work. They do not show exact arrangements and configurations required, nor do they show the exact routings, physical locations, or alignments necessary for coordination with existing conditions and other portions of the Work. Contractor shall coordinate modifications in layout as necessary to complete the Work in accordance with the design intent.
- B. Review Contract Documents for locations of exposed components. Where not indicated, submit an RFI or include notes requesting clarification on Shop Drawings or Coordination Drawings.
- C. Maintain maximum headroom at all locations. Unless indicated otherwise, all mechanical and electrical systems and associated components are to be installed as tight to underside of structure as possible.

- D. Make modifications in layout and components necessary to prevent conflict between each portion of the Work. Submit RFI when modification alters design intent of The Work.

1.10 REQUESTS FOR INTERPRETATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, and if not possible to request interpretation at Project meetings, Contractor shall prepare and submit an RFI in the form specified.
 - 1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 - a. Subcontractor RFI's shall be submitted to the Contractor for review and comment. The Contractor shall make reasonable efforts to research and answer subcontractors RFI's. Subcontractor RFI's that cannot be answered by the Contractor may be submitted to the Architect, but must be re-prepared on the approved form and with the required content.
 - 2. RFI's that relate to work of the Architect's consultants may be forwarded directly to the appropriate consultant but shall also be concurrently submitted to the Architect. The Architect will subsequently issue the formal response.
 - 3. RFI's that relate to responsibilities of the Owner, the work of the Owner's consultants, or work under the Owner's Separate Contracts shall be forwarded directly to the Owner but shall also be concurrently submitted to the Architect. Upon receiving the information from the Owner, the Architect will subsequently issue the formal response.
 - 4. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
 - 5. Where required to be in writing and not repeating information already contained in the Contract Documents, interpretations provided at meetings or from other verbal communications may be submitted as a Confirming RFI.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect and Construction Manager.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - 10. Field dimensions and conditions, as appropriate.
 - 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractor's signature.

13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. RFI Forms: AIA Document G716 or Software-generated form with substantially the same content as indicated above, acceptable to Architect.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect or Construction Manager after 1:00 p.m. will be considered as received the following working day.
 1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals. Architect will provide interpretation of Architect's comments on submittals, but only where necessary for Contractor to adequately prepare resubmittal. Otherwise requests for clarification of Architect's submittal comments shall be made directly on resubmittal.
 - f. Incomplete RFIs or inaccurately prepared RFIs with numerous errors.
 - g. Request for approval of alternate construction methods.
 - h. Requests for information already indicated in the Contract Documents
 - i. RFI's that are not prepared on the approved form with every applicable field complete.
 - j. RFI's that only make statements and do not include any question.
 - k. RFI's that are not clear regarding the nature of the question or requested clarification.
 - l. RFI's that do not contain document references regarding information purported to be in conflict.
 - m. Requests related to coordination between trades.
 - n. Requests related to construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with The Work.
 - o. Requests that are repeating questions answered in previous RFI responses.
 - p. Requests to provide proprietary product selections for products specified as nonproprietary.
 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 or resubmitted RFI.
 3. Architect's action shall not constitute an approval, direction, or procedure related to the construction means, methods, techniques, sequences, construction site safety program, procedures, or methodology of the Contractor.

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 Division 01 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 10 days of receipt of the RFI response.
 - b. If Architect believes the RFI response warrants change in the Contract Time or the Contract Sum, the Architect will issue documentation in accordance with Division 01 Section "Contract Modification Procedures." The documentation for contract modifications will be issued separately, but where possible Architect will make reference in RFI response to a pending contract modification.
 - E. 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 and Construction Manager.
 4. RFI number including RFIs that were dropped and not submitted.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's and Construction Manager's response was received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
 - F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven business days if Contractor disagrees with response.
 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
- 1.11 PROJECT MEETINGS
- A. General: Construction Manager will 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, Construction Manager, and Architect, within three days of the meeting.

- B. Preconstruction Conference: Construction Manager will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 business days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of record documents.
 - l. Use of the premises and existing building.
 - m. Work restrictions.
 - n. Working hours.
 - o. Owner's occupancy requirements.
 - p. Responsibility for temporary facilities and controls.
 - q. Procedures for moisture and mold control.
 - r. Procedures for disruptions and shutdowns.
 - s. Construction waste management and recycling.
 - t. Parking availability.
 - u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
 - z. Working hours.
 3. 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:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties who should have been present or requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at regular intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 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.
 - 21) Interface requirements.
 - 22) Sequence of operations.
 - 23) Status of submittals.
3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Commissioning Meetings: Commissioning (Cx) meetings will be held at several milestones during construction including a Kick-off meeting, Controls/ Balancing Coordination meeting, and Cx Progress Meetings. Cx Progress meetings will be held at varying intervals from

quarterly during the Construction Phase to monthly or bi-weekly during the Acceptance and Warranty Phase.

1. Attendees: In addition to representatives of Owner, Project Manager, and Architect (as needed), 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 conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda items for the meetings shall generally include:
 - a. Review of previous meeting minutes.
 - b. Schedule update.
 - c. Action Items.
 - d. Update Cx Record.
 - e. New Issues.
 - f. Coordination and look ahead until the next meeting.
3. Cx Agent shall document minutes of the meeting and distribute per the management protocols agreed to in the Cx Kick-Off meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 3100

SECTION 01 3200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Daily construction reports.
 - 4. Field condition reports.
 - 5. Photographic documentation
- B. Related Requirements:
 - 1. Division 01 Section "Payment Procedures" for submitting the Schedule of Values.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Float: The measure of leeway in starting and completing an activity.
- E. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- F. Major Area: A story of construction, a separate building, or a similar significant construction element.
- G. Milestone: A key or critical point in time for reference or measurement.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. PDF electronic file.
 - 3. Two paper copies.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article and in-house scheduling personnel to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for Architect's final release or approval.
- D. Preliminary Construction Schedule: Submit two printed copies.
- E. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- F. Preliminary Network Diagram: Submit two opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.
- G. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
- H. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.
- I. Construction Schedule Updating Reports: Submit with Applications for Payment.
- J. Daily Construction Reports: Submit at weekly intervals.
- K. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

- L. Site Condition Reports: Submit at time of discovery of differing conditions.
- M. Monthly Progress Reports: Submit two copies at monthly intervals.
- N. Material Location Reports: Submit two copies at monthly intervals.
- O. Special Reports: Submit two copies at time of unusual event.
- P. Qualification Data: For scheduling consultant or in-house CPM scheduler.

1.4 QUALITY ASSURANCE

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

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. General: The Contractor shall prepare and keep current, for the Architect's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Architect reasonable time to review submittals.
- B. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Indicate dates when final selection of products or systems described by an allowance must be provided to allow sufficient time for submittal preparation.
 - 3. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - 4. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.
 - a. Where warranted due to changes in submittal schedule, provide updates to submittal schedule with updates of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for commencement of the Work to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal 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. 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.
 - a. HVAC Equipment

3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 4. Startup and Testing Time: Include not less than 7 days for startup and testing.
 5. Commissioning (Cx): Include key milestones for Cx activities such as submission of key documentation and times and durations for functional testing of each major system.
 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.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work 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. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 5. Work Stages: Indicate important stages of construction for each major portion of the Work including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.
 6. Construction Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

- a. Structural completion.
 - b. Permanent space enclosure.
 - c. Completion of mechanical installation.
 - d. Completion of electrical installation.
 - e. Substantial Completion.
- D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.
- 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.
- F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and Contract Time.
- G. 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.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 15 days of date established for commencement of the Work. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was 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 (3) months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.5 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. CPM Schedule: Prepare Contractor's Construction Schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
 - 1. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 2. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
- C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and commissioning.
 - j. Punch list and final completion.
 - k. Activities occurring following final completion.
 - 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 - 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 - 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Principal events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
- G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

2.6 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.

7. Accidents.
8. Meetings and significant decisions.
9. Unusual events.
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

A. Monthly Progress Reports: Prepare a report including the following:

1. Written summary of project status.
2. Summary of percentage completion for project in both total cost and elapsed time.
3. Summary of status and progress of Trade Contracts.
4. Abbreviated copy of current construction schedule for total project duration.
5. Summary of change orders, budget, and cost control for project.
6. Summary of critical issues required to maintain construction schedule and budget.
7. Construction photographs.

B. Material Location Reports: At monthly intervals, prepare 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.

C. Field 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.

2.7 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: 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, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

2.8 DIGITAL PHOTOGRAPHIC RECORD

- A. The General Contractor shall maintain a digital photographic record of the progress of the work. Requirements as follows:
1. At the start of construction, record the condition of all spaces, just prior to the start of Selective Demolition. Make particular note of any spaces or conditions that are not as expected or as represented on the contract documents.
 2. When General Demolition is done or near done, take record photographs of the project perimeter walls, above the ceiling, taking care to cover the entire perimeter, with special attention to any noted perimeter fire walls, rated walls, or shaftwalls in the project area, and any existing penetrations of mechanical and electrical equipment that is not properly fire-safed.
 3. Take regular project progress photos on a minimum weekly basis, indicating general progress in all areas of the work.
 4. After all mechanical, electrical, and plumbing work has been done and all wall penetrations of same are properly fire-safed, take record photographs of project perimeter walls, above the ceiling, taking care to cover the entire perimeter, with special attention to any perimeter fire walls, rated walls, or shaftwalls in the project area, indicating that all existing penetrations have been properly fire-safed.
 5. Take interior photographs of project interior, at project completion.
- B. Photographic technique and digital photo naming techniques are as follows:
1. Use a digital camera with at least 6 megapixel resolution and the ability to save in '.jpg' format.
 2. Download photos to a PC and rename using the following:
 - a. Building name and floor
 - b. Project name
 - c. Date of photo
 - d. The photo number
 3. This will result in a photo name, for example, for the Jackson 7th floor Lab Renovation, taken on July 24, 2011, third photo, of: '**JK_07_Lab renovation_07_24_2011_03.jpg**.'
 4. All photos shall be named in this manner, and consistently in this format.
 5. Provide annotated project floor plans indicating where each photo was taken in the case of the perimeter photographs taken for the purposed of documenting fire-safing conditions. Annotated plans for general project progress documentation are not needed or required.
 6. Present photographs and annotated plans at project completion along with other as-built and record documents as a prerequisite to final completion.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

- B. Contractor's Construction Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule 3 days 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 Actual Completion percentage for each activity.
- C. 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.

END OF SECTION 01 3200

SECTION 01 3300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule.
 - 2. Division 01 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
 - 3. Division 01 Section "Closeout Procedures" for submitting warranties.
 - 4. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 5. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 6. Division 01 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Building Information Model (BIM): Digital data files containing a three-dimensional model based technology linked with a database of project information.
- E. Computer Aided Drafting (CAD): Digital data files containing two-dimensional drawings.
- F. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Architect's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals upon request and acceptance.
 - 1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record 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 CAD drawings will be formatted in Autodesk "AutoCAD 2008" release. The BIM drawings will be formatted in Autodesk "Revit Architecture 2011" release.
 - c. Contractor shall execute a data licensing agreement in the form of AIA Document C106, Digital Data Licensing Agreement or Agreement form acceptable to Owner and Architect. Contractor shall require all subcontractors, suppliers, and other entities receiving the data to execute the same data licensing agreement.
 - d. Plans, RCP and Elevations will be provided. Details will not be provided.
 - e. Digital Data files will be provided of the Contract Drawings issued at start of construction. Updates will be provided at major project milestones, and when the parties agree that significant updates have occurred to the files. Owner and Architect will determine level of revisions that constitute significant updates. Contractor, subcontractor, suppliers, and other entities shall not be entitled to receive file updates for all changes, clarifications, adjustments, and coordination. Contractors, subcontractors, suppliers, and other entities shall be responsible for maintaining and updating digital data files based on changes, clarifications, adjustments, coordination, and other revisions as required to complete submittals and as necessary to execute the Work.
- C. Digital data files will be furnished within 10 business days of receiving written request. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
- D. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect and Construction Manager reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received. Where withholding action Architect will provide written notification to Contractor. Architect's processing time will not start until receiving related submittals.
 - b. Where withholding action, Architect will provide written notification to Contractor within 7 days of Architect's receipt of submittal. Architect's processing time will not start until receiving related submittals.
- E. 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 Construction Manager and additional time for handling and reviewing submittals required by those corrections.
- F. Processing Time: Allow enough 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 14 calendar 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. Owner Review: Allow additional 7 calendar days for review by Owner and Owner's Facilities Department. Review by the Owner shall include review comments by the Design Team. Owner comments shall be returned to the Architect before being returned to the Contractor.
 3. Concurrent Review: Where concurrent review of submittals by Architect's consultants, Owner's consultants or other parties is required, transmit simultaneously to Architect and other parties. Allow 21 calendar days for initial review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
 - a. Submittal routing requirements for concurrent reviews will be reviewed at preconstruction meeting. Designation of submittals requiring concurrent review and instructions will be provided by Architect within 21 days after pre-construction meeting. Concurrent review requirements will be generally consistent with the following:
 - 1) Divisions 02, 26, 31, 32, and 33 civil engineering Specification sections are to be transmitted directly to the Architect's Civil Engineering Consultant.
 - 2) Divisions 03 & 05 Structural Specification sections are to be transmitted directly to the Structural Engineering Consultant.
 - 3) Divisions 21, & 22, Fire Protection & Plumbing specification sections are to be transmitted to the Architect's FP/P consultants.

- 4) Division 23 Heating, Ventilation and Air Conditioning specifications are to be transmitted to the Architect's HVAC consultant.
 - 5) Division 23 Electrical specifications are to be transmitted to the Architect's Electrical consultant.
 - 6) Division 23 Telecommunication and Data specifications are to be transmitted to the Architect's Tel/Data consultant.
4. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 5. Resubmittal Review: Allow 15 calendar days for review of each resubmittal.
 6. 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.
- G. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
- i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- H. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., 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.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Names of subcontractor, manufacturer, and supplier.
 - h. Category and type of submittal.
 - i. Submittal purpose and description.
 - j. Specification Section number and title.
 - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - l. Drawing number and detail references, as appropriate.
 - m. Location(s) where product is to be installed, as appropriate.
 - n. Related physical samples submitted directly.
 - o. Indication of full or partial submittal.
 - p. Transmittal number, numbered consecutively.
 - q. Submittal and transmittal distribution record.
 - r. Other necessary identification.
 - s. Remarks.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
 - a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
 - e. Resubmittal number added to original submission number.
- I. Options: Identify options requiring selection by Architect.
- J. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- K. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 1. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.

- L. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
 - 1. Transmittal Form: Use AIA Document G810.
- M. 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 "no exception taken" or "approved as noted."
- N. 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.
- O. Use for Construction: Use only final submittals with mark indicating "no exceptions taken or approved as noted" taken by Architect.
- P. Material Safety Data Sheets (MSDS):
 - 1. If required by the Owner, submit MSDSs directly to the Owner; do not submit to Architect.
 - a. Architect will not review submittals that include MSDSs and will return the entire submittal without review or discard.
 - b. Do not include MSDSs and remove MSDS sheets attached to product data or included with other submittals that require submission to the Architect.

1.4 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

- A. General: At Contractor's written request, copies of Architect's CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:
 - 1. The use of such files shall be limited to the preparation by the Construction Manager and its subcontractors of coordination drawings, shop drawings, and record drawings for this project.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements:
 - 1. Post electronic submittals as PDF electronic files directly to Project Web site specifically established for Project. Alert Architect and other consultants when available for review.

- a. Architect, through Construction Manager, will return annotated file. Annotate and retain one copy of file as an electronic Project record document file. Files for review by design consultants shall be returned through the architect to the Construction Manager.
2. Submit electronic submittals via email as PDF electronic files.
 - a. Architect, through Construction Manager, will return annotated file. Annotate and retain one copy of file as an electronic Project record document file. Files for review by design consultants shall be returned through the architect to the Construction Manager.
3. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect, through Construction Manager, will return two copies.
4. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect and Construction Manager will not return copies.
5. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

2.2 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's written recommendations.
 - c. Manufacturer's product specifications.
 - d. Manufacturer's installation instructions.
 - e. Standard color charts.
 - f. Standard product operation and maintenance manuals.
 - g. Statement of compliance with specified referenced standards.
 - h. Testing by recognized testing agency.
 - i. Application of testing agency labels and seals.
 - j. Notation of coordination requirements.
 - k. Availability and delivery time information.

1. Include additional items indicated in Division 1 section "Product Requirements" for items defined as or indicated to comply with requirements for 'Comparable Products'.
 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. Number of Copies: Submit three copies of Product Data, unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.
 6. Submit Product Data before or concurrent with Samples.
 7. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Notation of coordination requirements.
 - j. Notation of dimensions established by field measurement.
 - k. Relationship to adjoining construction clearly indicated.
 - l. Seal and signature of professional engineer if specified.
 - m. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 3. Number of Copies: Submit two opaque (bond) copies of each submittal. Architect will return one copy.
 4. BIM File Incorporation: Develop and incorporate Shop Drawing files into Building Information Model established for Project.

- a. Prepare Shop Drawings in the following format: Same digital data software program, version, and operating system as the original Drawings.
 - b. Refer to Division 01 Section "Project Management and Coordination" for requirements for coordination drawings.
 - c. Comply with BIM layering standards and other file management standards for project.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are 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 of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, through Construction Manager, will return one set with options selected.
 6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect and Construction Manager will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
7. Range samples: If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least four sets of units in quantity of units as required to show approximate limits of the variations.
8. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated.
9. Comply with requirements in Division 01 Section "Mockups" for mockups.
- 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. PDF electronic file.
 2. Number of Copies: Submit three copies of product schedule or list, unless otherwise indicated. Architect will return two copies.
- F. Submittals Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- G. Coordination Drawings Submittals: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- H. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- I. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."
- J. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- K. 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.
 1. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Architect will return two copies.
 2. Number and title of related Specification Section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.

2.3 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.

2. Certificates and Certifications: Provide a notarized 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.
 3. Test and Inspection Reports: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- C. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare 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.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- J. Material Test Reports: Prepare 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.
- K. Product Test Reports: Prepare written reports indicating 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.
- L. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

- M. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- N. Preconstruction Test Reports: Prepare 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.
- O. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, 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.
- P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Q. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- R. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.
 - 1. Preparation of substrates.
 - 2. Required substrate tolerances.
 - 3. Sequence of installation or erection.
 - 4. Required installation tolerances.
 - 5. Required adjustments.
 - 6. Recommendations for cleaning and protection.
- S. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
 - 1. Name, address, and telephone number of factory-authorized service 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.

- T. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- U. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.
 - 1. Architect will not review submittals that include MSDSs and will return them for resubmittal.

2.4 DELEGATED DESIGN

- 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 Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of 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.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect and Construction Manager.
 - 1. The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 - 1. No Exception Taken : Fabrication can proceed. Resubmittal not required and will be kept for project Record.
 - 2. Make Corrections Noted: Fabrication can proceed with noted corrections addressed . Resubmittal not required and will be kept for project Record.
 - 3. Revise and Resubmit: Resubmit submittal with noted corrections addressed. Fabrication should not proceed.
 - 4. Rejected: Resubmittal required with correct information.
 - 5. No Longer Required: Submittal returned as not reviewed.
- C. Informational Submittals: Architect and will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.
- D. Delegated Design Submittals: Architect will receive each submittal and will not return it, or will return the submittal with a letter it if it does not comply with requirements.
- E. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- F. Submittals not required by the Contract Documents may not be reviewed and may be discarded.
- G. Architect will review each submittal a maximum of three times. The contractor may be charged on a time and material basis for the Architect's review of all submittals after the third submission. In addition, the Contractor may be charged for review of out of sequence submittals as outlined on the approved submittal schedule.

END OF SECTION 01 3300

SECTION 01 7300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Markings and Identification
 - 6. General installation of products.
 - 7. Coordination of Owner-installed products.
 - 8. Progress cleaning.
 - 9. Starting and adjusting.
 - 10. Protection of installed construction.
 - 11. Correction of the Work.
- B. Related Requirements:
 - 1. Division 01 Section "Summary" for limits on use of Project site.
 - 2. Division 01 Section "Project Management and Coordination" for procedures for RFI's and coordinating field engineering with other construction activities.
 - 3. Division 01 Section "Submittal Procedures" for submitting surveys.
 - 4. Division 01 Section "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
 - 5. Division 01 Section "Closeout Procedures" for final cleaning.
 - 6. Division 01 Section "Project Record Documents" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels.
 - 7. Division 02 Section "Selective Structure Demolition" for demolition and removal of selected portions of the building.
 - 8. Division 07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.2 SUBMITTALS

- A. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.3 QUALITY ASSURANCE

- A. 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, notify Architect & Structural Engineer of locations and details of cutting and await directions from Architect & Structural Engineer before proceeding. Shore, brace, and support structural element 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.
 - 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.
 - 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.
- B. 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 requirements of Division 01 sustainable design requirements Section.
- 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.

PART 3 - EXECUTION

3.1 COORDINATION, GENERAL

A. Use of BIM:

1. Coordination of all building systems and trades are required to be completed in BIM. Contractors are required to submit systems models for coordination including information regarding existing conditions and coordination with adjacent trades. All conflicts shall be resolved within BIM coordination as required before fabrication and installation.

3.2 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of 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, 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

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

3.3 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a Request for Interpretation (RFI) to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.4 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Establish limits on use of Project site.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

3.5 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 clearances per applicable building codes in spaces without a suspended ceiling.
- 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 the best possible results. 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.
- 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: Do not use tools or equipment that produce harmful 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 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.
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. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 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 all work and adjacent areas 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: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- 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 minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. 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 Division 31 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. 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. 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.

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

3.7 MARKING AND IDENTIFICATION

- A. All Fire Walls, Fire Barriers, Fire Partitions, Smoke Barriers and Smoke Partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:
1. Be located in accessible concealed floor, floor-ceiling or attic spaces.
 2. Be repeated at intervals not exceeding 30 feet (914 mm) measured horizontally along the wall or partition.
 3. Include lettering not less than 0.5 inch (12.7 mm) in height, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER-PROTECT ALL OPENINGS," or other wording.

3.8 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction forces and Owner's Separate Contractors.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces and Owner's Separate Contractors.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Pre-installation Conferences: Include Owner's construction forces and Owner's Separate Contractors at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction forces and Owner's Separate Contractors if portions of the Work depend on Owner's construction.

3.9 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas and adjacent areas that are used as contractor pass-thru during off hours. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris. Remove all material and equipment from off hours staging areas.
- C. Adjacent Areas: All adjacent areas and worker pass through areas shall be cleaned daily prior to occupants and users start of operation.
- D. 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.
- E. 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.
- F. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- G. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- H. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
 - 1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.
- I. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- J. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

- K. 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.
- L. 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.
- M. 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.
- N. Pest Control: Engage an experienced, licensed exterminator to rid and control Project of rodents, insects, and other pests. Use of any pest control must be reviewed and approved by the Owner's Environmental Health and Safety department before commencing. Prepare a report for submission to Owner.
 - 1. As part of the construction set-up, Contractor shall implement all preventive methods for pest control.

3.10 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section "Quality Requirements."

3.11 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.12 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 7300

SECTION 01 7419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Division 02 Section "Selective Structure Demolition" for disposition of waste resulting from demolition of buildings, structures, and site improvements, and for disposition of hazardous waste.

1.2 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.

1.3 PERFORMANCE REQUIREMENTS

- A. General: 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, including the following:

1. Demolition Waste:
 - a. Asphaltic concrete paving.
 - b. Concrete.
 - c. Concrete reinforcing steel.
 - d. Brick.
 - e. Concrete masonry units.
 - f. Wood studs.
 - g. Wood joists.
 - h. Plywood and oriented strand board.
 - i. Wood paneling.
 - j. Wood trim.
 - k. Structural and miscellaneous steel.
 - l. Rough hardware.
 - m. Roofing.
 - n. Insulation.
 - o. Doors and frames.
 - p. Door hardware.
 - q. Windows.
 - r. Glazing.
 - s. Metal studs.
 - t. Gypsum board.
 - u. Acoustical tile and panels.
 - v. Carpet.
 - w. Carpet pad.
 - x. Demountable partitions.
 - y. Equipment.
 - z. Cabinets.
 - aa. Plumbing fixtures.
 - bb. Piping.
 - cc. Supports and hangers.
 - dd. Valves.
 - ee. Sprinklers.
 - ff. Mechanical equipment.
 - gg. Refrigerants.
 - hh. Electrical conduit.
 - ii. Copper wiring.
 - jj. Lighting fixtures.
 - kk. Lamps.
 - ll. Ballasts.
 - mm. Electrical devices.
 - nn. Switchgear and panelboards.
 - oo. Transformers.
2. Construction Waste:
 - a. Site-clearing waste.
 - b. Masonry and CMU.
 - c. Lumber.
 - d. Wood sheet materials.
 - e. Wood trim.
 - f. Metals.

- g. Roofing.
- h. Insulation.
- i. Carpet and pad.
- j. Gypsum board.
- k. Piping.
- l. Electrical conduit.
- m. Packaging: Regardless of salvage/recycle goal indicated in paragraph above,
- n. salvage or recycle 100 percent of the following uncontaminated packaging
- o. materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.

1.4 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 30 days of date established for the Notice to Proceed.
- B. Monthly Updates: Waste Hauler must submit monthly documentation of types and quantities of materials which have been hauled to date.

1.5 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.
 - 5. Quantity of waste recycled, both estimated and actual in tons.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
 - 8. Provide the average diversion rates for each material, for each month, for each facility.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Recycling Facility Qualification Data: For each recycling facility. Include the following:
 - 1. Letter signed by responsible party at recycling facility and on facility letterhead.
 - a. State qualifications including number of years in recycling business.
 - b. State end use of recycled materials.
 - c. State recycling rate of the recycling facility.
- H. Qualification Data: For waste management coordinator and refrigerant recovery technician.
- I. 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.

1.6 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of Projects with similar requirements, that employs a LEED Accredited Professional, certified by USGBC, as waste management coordinator.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan including responsibilities of waste management coordinator.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.

5. Review waste management requirements for Contractor, each Trade Contractor, and other parties that will be involved with disposal, recycling, and salvage of construction and demolition waste.

1.7 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
 1. Provide the total diversion rate from the recycling and processing facility(s) for the previous year as part of the Waste Management Plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
 1. Total quantity of waste.
 2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
 3. Total cost of disposal (with no waste management).
 4. Revenue from salvaged materials.
 5. Revenue from recycled materials.
 6. Savings in hauling and tipping fees by donating materials.

7. Savings in hauling and tipping fees that are avoided.
8. Handling and transportation costs. Include cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with Division 01 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.
- C. Training: Train workers, Trade Contractors, subcontractors, suppliers, Owner's construction forces, and Owner's Separate Contractors 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.
 3. Provide proper signage to ensure proper collection of recyclables.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, 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.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work:
 1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

C. Salvaged Items for Owner's Use:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

F. Plumbing Fixtures: Separate by type and size.

G. Lighting Fixtures: Separate lamps by type and protect from breakage.

H. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Owner.

C. 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.

D. 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 from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Asphalt Paving: Grind asphalt to maximum 1-1/2-inch (38-mm) size.
- B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 1. Pulverize concrete to maximum 1-1/2-inch (38-mm) size.
 2. Crush concrete and screen to comply with requirements in Division 31 Section "Earthwork" for use as satisfactory soil for fill or subbase.
- D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 1. Pulverize masonry to maximum 1-1/2-inch (38-mm) size.
 2. Crush masonry and screen to comply with requirements in Division 31 Section "Earthwork" for use as satisfactory soil for fill or subbase.
- E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- F. Metals: Separate metals by type.
 1. Structural Steel: Stack members according to size, type of member, and length.
 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

- J. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- K. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 - 1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- L. Carpet Tile: Remove debris, trash, and adhesive.
 - 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- N. Lighting Fixture Lamps: Separate lamps by type and protect from breakage.
- O. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Site-Clearing Wastes: Chip brush, branches, and trees on-site or at landfill facility.
- C. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- D. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
 - 1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials from Owner's property and legally dispose of them.
- D. Use of building owner & occupants' dumpsters is prohibited.

END OF SECTION 01 7419

SECTION 01 7700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection Procedures
 - 2. Substantial Completion procedures.
 - 3. Final completion procedures.
 - 4. Warranties.
 - 5. Final cleaning.
 - 6. Repair of the Work.
- B. Related Requirements:
 - 1. Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
 - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Division 01 Section "Execution" for progress cleaning of Project site.
 - 4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 5. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 ACTION SUBMITTALS

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

1.3 CLOSEOUT SUBMITTALS

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

1.4 MAINTENANCE MATERIAL SUBMITTALS

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

1.5 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. 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.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs and photographic negatives, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 8. Complete startup testing of systems.
 - 9. Submit test/adjust/balance records.
 - 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 11. Advise Owner of changeover in heat and other utilities.
 - 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 - 13. Complete final cleaning requirements, including touchup painting.
 - 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- C. 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 Divisions 02 through 49 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Divisions 02 through 49 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. 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 Owner's signature for receipt of submittals.
 5. Submit test/adjust/balance records.
 6. Submit sustainable design submittals required in Division 01 sustainable design requirements Section and in individual Division 02 through 49 Sections.
 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- D. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section "Demonstration and Training."
 6. Advise Owner of changeover in heat and other utilities.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements, including touchup painting.
 10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
 11. Submit test/adjust/balance records.
 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 13. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs and photographic negatives, damage or settlement surveys, property surveys, and similar final record information.

- E. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.6 FINAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 - 1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
 - 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Submit pest-control final inspection report and warranty.
 - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 - 6. Submit a copy of the Functional Acceptance Letter from the Commissioning Agent which documents that the building has successfully passed functional testing and the Endurance Period.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order,.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

3. Submit list of incomplete items in the following format.
 - a. Include the following information at the top of each page:
 - 1) Project name.
 - 2) Date.
 - 3) Name of Architect.
 - 4) Name of Contractor.
 - 5) Page number.
 - b. MS Excel electronic file. Architect will return annotated copy.
 - c. PDF electronic file. Architect will return annotated copy.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Submittal Time: 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.
- 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 the Project Manual.
 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch 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. Minimize use of added fragrances in cleaning products.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Final cleaning to include scrape and clean of previous tenant graphics from glazing on door lites.
- C. Cleaning: Employ 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 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. Remove snow and ice to provide safe access to building.
 - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - f. Ensure that cleaning agents and methods do not remove finishes and permanent protective coatings on surfaces being cleaned. Follow manufacturer's printed maintenance requirements for cleaning.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - j. Wash, Wax and finish appropriate floor surfaces to level acceptable to the owner. Level of finish shall be that of move in and operational level equal to Owner's standard. (Minimum of 8 coats of wax where applicable.)
 - k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - l. Remove labels that are not permanent.

- m. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - n. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - o. Replace parts subject to unusual operating conditions as determined by owner or architect's review.
 - p. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - q. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - s. Leave Project clean and ready for occupancy.
- D. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report for submission to Owner.
- E. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

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 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 01 7700

SECTION 01 7823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. This 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. Maintenance manuals for the care and maintenance of products, materials, and finishes systems and equipment.
- B. Related Requirements:
 - 1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Division 01 Section "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.
 - 3. Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.2 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.

1.3 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

- a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect, through Construction Manager, will return two copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Submit copy to Architect and concurrent reviewers including Architect's consultants and Commissioning Agent. Architect will collate and return comments 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. Organization: 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. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.
- B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain a title page, table of contents, and manual contents.
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- C. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Construction Manager.
 - 7. Name and contact information for Architect.
 - 8. Name and contact information for Commissioning Authority.
 - 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 - 10. Cross-reference to related systems in other operation and maintenance manuals.
- D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

- G. Manual Contents, Paper Copy: 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.
1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
 4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for type of emergency, emergency instructions, and emergency procedures.
1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.

- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor is delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
 - 1. Product name and model number.
 - 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 start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.
 - 3. Routine and normal operating instructions.

4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

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

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

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

END OF SECTION 01 7823

SECTION 01 7839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Division 01 Section "Closeout Procedures" for general closeout procedures.
 - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints.
 - 3) Submit .DWG electronic files updated to include changes to the work.
 - 4) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit .dwg electronic files updated to include changes to the work and including comments received from Architect and Owner.
 - 2) Submit one set of drawings in PDF format, plotted from .DWG files.
 - 3) Submit one printed paper-copy. Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy and annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

- C. Record Product Data: Submit one paper copy and annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
 - 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 prepare the 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.
 - f. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
 - 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. Clarifications provided with Architect's response to RFI's.
 - m. Changes made by Architect's Supplemental Instructions.
 - n. Minor changes in the work or clarifications provided in writing by Architect.
 - o. Details not on the original Contract Drawings.
 - p. Field records for variable and concealed conditions.
 - q. 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
 6. from original Drawings.
 7. Note Construction Change Directive numbers, RFI numbers, alternate numbers, Bulletin 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 and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: DWG.
 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 through Construction Manager for resolution.
 - a. Architect makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings.
 - b. Software Programs: The Contract Drawings are available in Autocad 2014.
 4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. 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 and Construction Manager.
 - e. Name of Contractor.

2.2 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. Note related Change Orders, Record Product Data, and Record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy and annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. 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.
- B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

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

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project

Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION 01 7839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

1.3 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training.

1.4 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

- B. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

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

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

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner with at least 7 days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

END OF SECTION 017900

SECTION 02 4119 - SELECTIVE INTERIOR DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse or reinstall where indicated on drawings.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 PREINSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site with Owner's Project Manager.
 1. Identify items to be salvaged at request of owner.

1.4 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
- C. Predemolition photographs or video: Show existing conditions of egress, adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations.

1.5 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.

1.6 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- A. Owner assumes no responsibility for actual condition of buildings to be selectively demolished.
 - 1. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. 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.
- D. 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.
- E. Arrange demolition schedule so as not to interfere with operations of adjacent occupied spaces.
- F. Before start of work, obtain and pay for permits required by authorities having jurisdiction and notify interested utilities companies.

1.7 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

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 ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- F. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations.
- G. Return adjacent areas to condition existing prior to start of work.

3.2 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 indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. The General Contractor, in close coordination with the client and the building owner will arrange to shut off indicated services/systems when requested by Contractor.
2. Arrange to shut off indicated 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 to be removed.
5. Utility Requirements: Refer to Division 21 through 27 Sections for shutting off, disconnecting, removing, and sealing or capping utility services. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.
 - 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.
 - 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.

3.3 PREPARATION

- A. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
- B. 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.
- C. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- D. Temporary Shoring: 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.

- E. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
 - 1. Erect temporary protection where required by authorities having jurisdiction.
 - 2. Protect walls, ceilings, floors and other existing finish work that are to remain and area exposed during selective demolition operations.

3.4 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. 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, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 5. Dispose of demolished items and materials promptly.
- B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.
- C. 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.
- D. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - 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.
- E. 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 cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, surrounding finished spaces and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
- C. Temporary Protection: Erect temporary protection where required by authorities having jurisdiction and as indicated. Comply with requirements in Division 01 Section "Temporary Facilities And Controls."
 1. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 2. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent spaces.
 3. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
 4. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent spaces.
- D. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.
 1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.

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

3.7 PATCHING AND REPAIRS

- A. Promptly patch and repair holes and damages surfaces caused to adjacent construction by selective demolition activities
- B. Patching is specified in Division 1 Section "Cutting and Patching"

3.8 CLEANING

- A. Remove demolition waste materials from Project site and legally dispose of them in an EPA-approved landfill acceptable to authorities having jurisdiction.
- B. 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.
- C. Change filters on air-handling equipment on completion of selective demolition operations.

END OF SECTION 02 4119

SECTION 05 5000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous steel framing and supports.

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.

1.2 PERFORMANCE REQUIREMENTS

A. 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.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Paint products.
2. Grout.

B. 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.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide [Type 304] [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.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
 - 2. Provide stainless-steel fasteners for fastening stainless steel.
 - 3. Provide stainless-steel fasteners for fastening nickel silver.
 - 4. Provide bronze fasteners for fastening bronze.
- B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
- C. Post-Installed Anchors: Torque-controlled expansion 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.
 - 2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 1 (A1) Group 2 (A4) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
- D. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches (41 by 22 mm) by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches (200 mm) o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

- A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Shop Primers: Provide primers that comply with Division 09 painting Sections.
- C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

- D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- F. 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.
- G. 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)**.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- C. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.
- E. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 24 inches (600 mm) o.c.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

- C. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.
 - 1. Where wood nailers are attached to girders with bolts or lag screws, drill or punch holes at 24 inches (600 mm) o.c.
- D. Loose Bearing and Leveling Plates: Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts.
- A. Miscellaneous Steel Trim: Fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

2.7 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.

2.8 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize exterior items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with universal shop primer indicated.
- C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
 - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with

edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05 5000

SECTION 06 1053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood blocking and nailers.
2. Wood furring.
3. Plywood backing panels.

1.2 ACTION SUBMITTALS

- ##### A. Product Data:
- For each type of process and factory-fabricated product.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- ##### A. Lumber:
- DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
- ##### B. Maximum Moisture Content of Lumber:
- 19 percent for 2-inch nominal (38-mm actual) thickness or less; no limit for more than 2-inch nominal (38-mm actual) thickness unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- ##### A. Preservative Treatment by Pressure Process:
- AWPA U1; Use Category UC2
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- ##### B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- ##### C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. 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, and 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. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.

C. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Framing for raised platforms.
2. Concealed blocking.
3. Roof framing and blocking.
4. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
5. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Rooftop equipment bases and support curbs.
 - 4. Cants.
 - 5. Furring.
 - 6. Grounds.
 - 7. Utility shelving.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species.
- C. Utility Shelving: Lumber with 19 percent maximum moisture content of eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; Premium or No. 2 Common (Sterling) grade; NeLMA, NLGA, WCLIB, or WWPA.

2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C Exterior, C-C Plugged Exposure 1, C-D Plugged, or fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.6 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. Screws for Fastening to Metal Framing: ASTM C 1002 or ASTM C 954, length as recommended by screw manufacturer for material being fastened.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

2.7 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. Adhesives shall have a VOC content of 70 g/L or less.

- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber] or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 - 3. ICC-ES evaluation report for fastener.

3.2 PROTECTION

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

END OF SECTION 061053

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.
1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.

1.5 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:

1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."
 - 2) Intertek Group in its "Directory of Listed Building Products."
 - 3) FM Global in its "Building Materials Approval Guide."

2.2 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. 3M Fire Protection Products.
 - b. A/D Fire Protection Systems Inc.
 - c. Construction Solutions.
 - d. Hilti, Inc.
 - e. Specified Technologies, Inc.
 - f. Tremco, Inc.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems 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. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems 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. F-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated.
 - 2. T-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
 - 3. W-Rating: Provide penetration firestopping systems showing no evidence of water leakage when tested according to UL 1479.
- D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined per UL 1479, based on testing at a positive pressure differential of 0.30-inch wg (74.7 Pa).
 - 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at and no more than 50-cfm (0.024-cu. m/s) cumulative total for any 100 sq. ft. (9.3 sq. m) at both ambient and elevated temperatures.
- E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, 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 system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- C. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- D. Install fill materials by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.2 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches (76 mm) high and with minimum 0.375-inch (9.5-mm) strokes.
 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet (4.57 m) from end of wall and at intervals not exceeding 30 feet (9.14 m).
- B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 2. Contractor's name, address, and phone number.
 3. Designation of applicable testing and inspecting agency.
 4. Date of installation.
 5. Manufacturer's name.
 6. Installer's name.

3.3 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E 2174.
- B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

END OF SECTION 078413

SECTION 07 9200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes joint sealants for the following applications, including those specified by reference to this Section. Refer to Related Sections for additional requirements for joint sealants specified in this Section. Joints receiving sealants specified in this section include:
 - 1. Interior joints in the following vertical surfaces and horizontal surfaces:
 - a. Perimeter joints between interior wall surfaces and frames of interior doors, windows and other frames.
 - b. Other joints as indicated.
 - c. Urethane joint sealants.
 - d. Latex joint sealants.
 - e. Acoustical joint sealants.

1.2 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water resistant continuous joint seals without staining or deteriorating joint substrates.

1.3 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers samples of materials that will contact or affect joint sealants. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

- A. Product test reports. Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.
- B. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- B. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.
- C. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- D. Pre-installation Conference: Participate in preconstruction conference at Project site to review methods and procedures related to joint sealants

1.7 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (5 deg C).
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
- B. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory.

1.8 WARRANTY

- A. General Warranty: 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. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five (5) years from date of Substantial Completion.
- C. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five (5) years from date of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect materials in transit and stored materials from damage due to exposure to moisture, excess heat, sparks, flame, or any other cause.
- B. Replace damaged materials.
- C. All materials to be new. Handle all materials to prevent damage.
- D. Protect all materials in original unopened labeled containers and packaging and in compliance with manufacturer's directions. Comply with manufacturer's recommendations for minimum and maximum time and temperature limits for storage.
- E. Promptly remove from the site all materials rejected by the Architect during transportation, storage, handling, and installation.
- F. Use waterproof tarpaulins to cover all stored materials top to bottom. Store flammable materials in a cool, dry, protected area away from sparks and open flames.
- G. Materials shall be marked with the date of manufacture and shelf life. Do not use products beyond the expiration of their shelf life.
- H. Do not stockpile materials or equipment to overload any building or site component.
- I. The Contractor is responsible for protecting all materials and equipment stored on the site.
- J. Protect liquid components (including sealants) and all other materials from damage due to freezing or other damage due to extreme temperatures.

- K. Do not dilute primers, cleaners, or sealants. Keep containers closed, except when removing materials.
- L. Dispose of debris as required by Owner and all state and local ordinances.
- M. Do not allow construction debris or other miscellaneous materials to be included in the system.

1.10 SEQUENCING

- A. Coordinate with requirements of material and personnel hoists. Defer installation at obstructed areas, and install materials when obstructions are removed.
- B. Coordinate schedule, work, and installation procedure with other trades to ensure construction of conditions shown in Contract Documents and to ensure protection of building and interior from weather and damage.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- C. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. 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.

- E. 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.
- F. 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.
- G. Colors of Exposed Joint Sealants: As indicated by manufacturer's designations or as selected by Architect from manufacturer's full range.

2.2 URETHANE JOINT SEALANTS

- A. Urethane Joint Sealant: ASTM C 920.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Lymtal, International, Inc.
 - d. May National Associates, Inc.
 - e. Pacific Polymers International, Inc.
 - f. Pecora Corporation.
 - g. Polymeric Systems, Inc.
 - h. Schnee-Morehead, Inc.
 - i. Sika Corporation; Construction Products Division.
 - j. Tremco Incorporated.
 - 2. Type: Single component (S).
 - 3. Grade: Nonsag (NS).
 - 4. Class: 100/50.

2.3 LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. May National Associates, Inc.
 - d. Pecora Corporation.
 - e. Schnee-Morehead, Inc.
 - f. Tremco Incorporated.

2.4 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Joint Sealant : Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Pecora Corporation.
 - b. USG Corporation.

2.5 JOINT SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type O (open-cell material) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.6 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.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.

- G. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.
- H. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.4 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes hollow-metal doors and frames.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include elevations, frame profiles, metal thicknesses, preparations for hardware, and other details.
- C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Ceco Door; ASSA ABLOY.
 - 2. Curries Company; ASSA ABLOY.
 - 3. DE LA FONTAINE.
 - 4. Mesker Door Inc.
 - 5. Stiles Custom Metal, Inc.

2.2 INTERIOR DOORS AND FRAMES

- A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. Typical throughout project unless otherwise indicated.
 - 1. Physical Performance: Level B according to SDI A250.4.
 - 2. Doors:

- a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Uncoated, Metallic-coated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Mineral board.
3. Frames:
- a. Materials: Metallic-coated, steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - b. Construction: Knocked down or Face welded.
4. Exposed Finish: Prime.

2.3 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
4. Postinstalled 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.

- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

2.4 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).
- I. Glazing: Comply with requirements in Section 088000 "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat.

2.5 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 - 2. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Sidelite Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 - 4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 5. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing.
 - b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c.

- c. Compression Type: Not less than two anchors in each frame.
 - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
- 6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
- D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce frames to receive nontemplated, mortised, and surface-mounted hardware.
 - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
 - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior frames.
 - 4. Provide loose stops and moldings on inside of hollow-metal work.
 - 5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.6 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: SDI A250.10.

2.7 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable stops located on secure side of opening.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 4. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
 5. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
 - b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
 - c. At Bottom of Door: [3/4 inch (19.1 mm)] [5/8 inch (15.8 mm)] plus or minus 1/32 inch (0.8 mm).
 - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.

- C. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
 - 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 1113

SECTION 08 3113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes access doors and frames for walls and ceilings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product, including fabrication and installation details of access doors and frames. Include plans, elevations, sections, details, and attachments to other work.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES

- A. Flush Access Doors with Exposed Flanges:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Acudor Products, Inc.
 - b. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - c. Nystrom, Inc.
 - 2. Description: Face of door flush with frame, with exposed flange and concealed hinge.
 - 3. Locations: Wall.
 - 4. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch (1.63 mm), 16 gage, factory primed.
 - 5. Frame Material: Same material, thickness, and finish as door.
 - 6. Latch and Lock: Cam latch, key operated.

2.2 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

- D. Frame Anchors: Same material as door face.
- E. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.3 FABRICATION

- A. 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.
- B. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.
- C. Latch and Lock Hardware:
 - 1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
 - 2. Keys: Furnish two keys per lock and key all locks alike.

2.4 FINISHES

- A. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 08 3113

SECTION 08 4243 MANUAL TELESCOPING ENTRANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following types of intensive care unit/critical care unit (ICU/CCU) entrances:
 - 1. Interior, 3-panel telescoping manual sliding ICU/CCU entrances without track.

1.3 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- C. International Organization for Standardization (ISO):
 - 1. ISO 9001 - Quality Management Systems
- D. National Association of Architectural Metal Manufacturers (NAAMM):
 - 1. Metal Finishes Manual for Architectural and Metal Products.
- E. American Architectural Manufacturers Association (AAMA):
 - 1. AAMA 607.1 - Clear Anodic Finishes for Architectural Aluminum.
 - 2. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.
 - 3. AAMA 701 Voluntary Specification for Pole Weatherstripping and Replaceable Fenestration Weatherseals.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide ICU/CCU entrances capable of withstanding structural loads and thermal movements based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Operating Range: Minus 30 deg F (Minus 34 deg C) to 130 deg F (54 deg C).
- C. Opening-Force Requirements for Egress Doors: Force shall be adjustable; but, not more than 50 lbf (222 N) required to manually set swinging egress door panel(s) in motion.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware mounting heights, and attachments to other work.
- C. Color Samples for selection of factory-applied color finishes.
- D. Closeout Submittals:
 - 1. Owner's Manual.
 - 2. Warranties.

1.6 QUALITY ASSURANCE

- A. Manufacturer shall have in place a national service dispatch center providing 24 hours a day, 7 days a week, emergency call back service.
- B. Source Limitations: Obtain ICU/CCU entrances through one source from a single manufacturer.
- C. Product Options: Drawings indicate sizes, profiles, and dimensional requirements of ICU/CCU entrances and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
- D. Emergency-Exit Door Requirements: Comply with requirements of authorities having jurisdiction for ICU/CCU entrances serving as a required means of egress.

1.7 PROJECT CONDITIONS

- A. Field Measurements: General Contractor shall verify openings to receive ICU/CCU entrances by field measurements before fabrication and indicate measurements on Shop Drawings.
- B. Mounting Surfaces: General Contractor shall verify all surfaces to be plumb, straight and secure; substrates to be of proper dimension and material.
- C. Other trades: General Contract shall advise of any inadequate conditions or equipment.

1.8 COORDINATION

- A. Templates: Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing ICU/CCU entrances to comply with indicated requirements.
- B. Electrical System Roughing-in: Coordinate layout and installation of ICU/CCU entrances with connections to facility grounding system.
- C. Install only when downflow booth manufacturer has completed their installation.

1.9 WARRANTY

- A. ICU/CCU entrances shall be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.
- B. During the warranty period the Owner shall engage a factory-trained technician to perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.
- C. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal working hours.

PART 2 - PRODUCTS

2.1 ICU/CCU ENTRANCES

- A. Basis of Design Manufacturer: Stanley Access Technologies; Dura-Care™ 7500TL Series manual sliding ICU/CCU entrances.
- B. Substitutions: See Division 1, Section 01 25 00 Substitution Procedures.

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Headers, stiles, rails, and frames 6063-T6
 - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
 - 3. Sheet and Plate: ASTM B 209.
- B. Sealants and Joint Fillers: Performed under Division 7 Section "Joint Sealants".

2.3 ICU/CCU ENTRANCE ASSEMBLIES

- A. General: Provide manufacturer's standard ICU/CCU entrance assemblies including doors, sidelights, framing, headers, carrier assemblies, roller tracks, pivots, and accessories required for a complete installation.

- B. ICU/CCU Entrances:
 - 1. Configuration: Two sliding panels and one full sidelight.
 - 2. Traffic Pattern: Two-way.
 - 3. Emergency Breakaway Capability: Lead sliding panel only.
 - 4. Mounting: Between jambs
 - 5. Track: None, trackless.
- C. Telescopic Operation: ICU/CCU entrances shall be designed for coordinated movement of sliding panels such that the movement of the lead sliding panel initiates and controls movement of the trailing sliding panel.

2.4 COMPONENTS

- A. Framing Members: Manufacturer's standard extruded aluminum reinforced as required to support imposed loads.
 - 1. Nominal Size: 1 ¾ inch by 6 inch (45 by 152 mm)
 - 2. Concealed Fastening: Framing shall incorporate a concealed fastening pocket, and continuous flush insert cover, extending full length of each framing member.
- B. Stile and Rail Doors and Sidelights: Manufacturer's standard 1 ¾ inch (45 mm) thick glazed doors with extruded-aluminum tubular stile and rail members. Incorporate concealed tie-rods that span full length of top and bottom rails.
 - 1. Glazing Stops and Gaskets: Snap-on, extruded-security aluminum stops and preformed gaskets.
 - 2. Stile Design: Narrow stile; 2 inch (51 mm) nominal width.
 - 3. Bottom Rail Design: Minimum 4 inch (102 mm) nominal height.
 - 4. Muntin Bars: Horizontal tubular rail member for each door; 2 inch (51 mm) nominal width.
- C. Glazing: Furnished under Division 8 Section Glazing. All Glazing furnished under separate section shall be 1/4 inch (6 mm) tempered.
- D. Headers: Fabricated from extruded aluminum and extending full width of ICU/CCU entrance units to conceal carrier assemblies, and roller tracks. Provide hinged or removable access panels for service and adjustment of door carrier assemblies. Secure panels to prevent unauthorized access. Mounting shall be concealed, with one side of header flush with framing.
- E. Carrier Assemblies and Overhead Roller Tracks: Manufacturer's standard carrier assembly that allows vertical adjustment of at least 1/8 inch (3 mm); consisting of urethane with precision steel lubricated ball-bearing wheels, operating on a continuous roller track. Support panels from carrier assembly with load wheels and factory adjusted cantilever and pivot assembly and integrated anti-riser mechanism. Minimum two ball-bearing load wheels for each active leaf. Minimum load wheel diameter shall be 1 3/8 inch (35 mm).
- F. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.

2.5 HARDWARE

- A. General: Provide units in sizes and types recommended by ICU/CCU entrance and hardware manufacturers for entrances and uses indicated.
- B. Emergency Breakaway Feature: Provide release hardware that allows panel(s) to swing out in direction of egress to full 90 degrees from any position in sliding mode. Maximum force to open panel shall be 50 lbf (222 N).
 - 1. Emergency breakaway feature shall include at least one adjustable detent device mounted in the top of each breakaway panel to control panel breakaway force.
 - 2. Limit Arms: Limit arms shall be provided to control swing of sliding panels on break-out; swing shall not exceed 90 degrees. Limit arms shall be spring loaded to prevent shock, and include adjustable friction damping.
- C. Positive Latch: Manufacturer's standard non-keyed, spring loaded, latch and strike that can secure sliding door panels to adjacent panels or jambs. Strike shall mount flush to surface of framing. Latch shall engage by closing action of door.
- D. Sliding Weather Stripping: Manufacturer's standard replaceable components complying with AAMA 701; vinyl or rubber.
- E. Pulls: Provide manufacturer's standard flush cup pulls.

2.6 FABRICATION

- A. General: Factory fabricate ICU/CCU entrance components to designs, sizes, and thickness indicated and to comply with indicated standards.
 - 1. Form aluminum shapes before finishing.
 - 2. Use concealed fasteners to greatest extent possible.
 - a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - b. Reinforce members as required to receive fastener threads.
- B. Framing: Provide ICU/CCU entrances as prefabricated assemblies.
 - 1. Fabricate tubular and channel frame assemblies with manufacturer's standard mechanical or welded joints. Provide sub-frames and reinforcement as required for a complete system to support required loads.
 - 2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
 - 3. Form profiles that are sharp, straight, and free of defects or deformations.
 - 4. Prepare components to receive concealed fasteners and anchor and connection devices.
 - 5. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
- C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.
- D. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated.

- E. Hardware: Factory install hardware to the greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site.

2.7 ALUMINUM FINISHES

- A. General: Comply with NAAMM Metal Finishes Manual for Architectural and Metal Products for recommendations for applying and designing finishes. Finish designations prefixed by AA comply with system established by Aluminum Association for designing finishes.
- B. Class II, Clear Anodic Finish: AA-M12C22A31 Mechanical Finish: as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.40 mils minimum complying with AAMA 611-98, and the following:
 - 1. AAMA 607.1
 - 2. Applicator must be fully compliant with all applicable environmental regulations and permits, including wastewater and heavy metal discharge.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of ICU/CCU entrances. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Do not install damaged components. Fit frame joints to produce joints free of burrs and distortion. Rigidly secure non-movement joints.
- B. Entrances: Install ICU/CCU entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
 - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.
- C. Grounding: Connect ICU/CCU entrances to building grounding system as specified in Division 26 Sections.
- D. Glazing: Performed under Division 8 Section "Glazing" in accordance with ICU/CCU entrance manufacture's instructions.
- E. Sealants: Comply with requirements specified in Division 7 Section "Joint Sealants".

3.3 FIELD QUALITY CONTROL

- A. Testing Services: Factory Trained Installer shall test and inspect each ICU/CCU entrance to determine compliance of installed systems with applicable standards.

3.4 ADJUSTING

- A. Adjust ICU/CCU entrances, and hardware for smooth and safe operation.

3.5 CLEANING AND PROTECTION

- A. Clean glass and aluminum surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish. Comply with requirements in Division 8 Section "Glazing", for cleaning and maintaining glass.

END OF SECTION 08 4243

SECTION 08 7100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Mechanical door hardware for the following:

a. Swinging doors.

B. Products furnished, but not installed, under this Section include the products listed below. Coordinating and scheduling the purchase and delivery of these products remain requirements of this Section.

1. Permanent lock cores to be installed by Owner.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each exposed product and for each color and texture specified.

C. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.

b. Content: Include the following information:

- 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
- 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
- 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
- 4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.

1.3 QUALITY ASSURANCE

- A. **Installer Qualifications:** Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
- B. **Architectural Hardware Consultant Qualifications:** A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as follows:
 - 1. For door hardware, an Architectural Hardware Consultant (AHC).
- C. **Accessibility Requirements:** For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and the Massachusetts Architectural Access Board, 521 CMR.
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
 - 2. Comply with the following maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - b. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - 3. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- D. **Keying Conference:** Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.4 WARRANTY

- A. **Special Warranty:** Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. **Warranty Period:** five (5) years from date of Substantial Completion, unless otherwise indicated.
 - a. Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
 1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
 2. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.

2.2 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on solid core wood doors and hollow-metal frames.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hager Companies.
 - b. McKinney Products Company; an ASSA ABLOY Group company.
 - c. Stanley Commercial Hardware; Div. of The Stanley Works.

2.3 MECHANICAL LOCKS AND LATCHES

- A. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
- B. Mortise Locksets: BHMA A156.13.
 1. Manufacturers: Subject to verification (by GC) of currently installed hardware in existing building, provide:
 - a. Sargent an ASSA ABLOY Group company
 - 1) 8200 Series Mortised lockset

2.4 SURFACE CLOSERS

- A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers Subject to verification (by GC) of currently installed hardware in existing building, provide:
 - a. Rixson; an ASSA ABLOY Group company.

2.5 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: BHMA A156.16; stainless steel base metal.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Burns Manufacturing Incorporated.
 - b. Hager Companies.
 - c. Rockwood Manufacturing Company.

2.6 AUXILIARY DOOR HARDWARE

- A. Auxiliary Hardware: BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Baldwin Hardware Corporation.
 - b. Cal-Royal Products, Inc.
 - c. Don-Jo Mfg., Inc.
 - d. Hager Companies.
 - e. Rockwood Manufacturing Company.
 - f. Stanley Commercial Hardware; Div. of The Stanley Works.
 - g. Trimco.

2.7 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 2. Fire-Rated Applications:
 - a. Wood or Machine Screws: For the following:

- 1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors.
 - 2) Strike plates to frames.
 - 3) Closers to doors and frames.
- b. Steel Through Bolts: For the following unless door blocking is provided:
- 1) Closers to doors and frames.
3. Spacers or Hex Bolts: For through bolting of hollow-metal doors.
 4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
 5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.8 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Hardware Finish: Provide satin stainless steel, US32D, unless otherwise noted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
- C. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- D. Install each door hardware item to comply with manufacturer's 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 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- E. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- F. Lock Cylinders: Install construction cores to secure building and areas during construction period.
1. Replace construction cores with permanent cores as directed by Owner.
 2. Furnish permanent cores to Owner for installation.
- G. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- H. Thresholds: Set thresholds for doors indicated in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- I. Stops: Provide wall stops for doors unless floor or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- J. 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.
1. Door Closers: Unless otherwise required by authorities having jurisdiction, adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
 2. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make a final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- K. Clean adjacent surfaces soiled by hardware installation.
- L. Instruct Owner's personnel in the proper adjustment, lubrication, and maintenance of door hardware and hardware finishes.

3.2 FIELD QUALITY CONTROL

- A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

- B. Prior to Substantial Completion, the installer, accompanied by representatives of the manufacturers of locks, exit devices, closer, and any electrified hardware, shall perform the following work:

1. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.
2. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures.
3. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.
4. Prepare a written report of current and predictable problems of substantial nature in the performance of the hardware.

3.3 PROTECTION

- A. Provide for the proper protection of complete items of hardware until the Owner accepts the project as complete. Damaged or disfigured hardware shall be replaced or repaired by the responsible party.

3.4 DOOR HARDWARE SCHEDULE

HW-1 GOWNING ENTRY: UNEQUAL PAIR, CARD READER, FIRE RATED

Continuous Hinge	HG-305 EL-12 ETAP SS Bearings
Continuous Hinge	HG-305 SS Bearings
Flush Bolt Set	2845
Dust Proof Strike	570
Fail Secure Electric Lock	RX SG 72 8271-24V CRMI
SFIC Core	SFIC to match existing
Door Closer	421 CTB/PCTB
Closer Mounting plate	1413J
Door Closer	1331 JO 1331B
Concealed Overhead Stop	1-X36
Armor Plate (2)	K1050 34" 4BE CSK F
Edge Guard (2)	306B X Dr Height, cutout for hardware
Door Stop (2)	409 32D
Coordinator	2670 Series w/ filler mounting brackets
Head & Jamb Seal	S773D
Astragal	S771C (clear)
Wiring Harness	QC-Cxxx (hinge to device)
Wiring Harness	QC-CxxxP (hinge/strike to junction box)

HW-2 LAB ENTRY: UNEQUAL PAIR, CARD READER

Continuous Hinge	HG-305 EL-12 ETAP SS Bearings
Continuous Hinge	HG-305 SS Bearings
Flush Bolt Set	555
Dust Proof Strike	570
Fail Secure Electric Lock	RX SG 72 8271-24V CRMI
SFIC Core	SFIC to match existing
Door Closer	421 CTB/PCTB
Armor Plate (2)	K1050 34" 4BE CSK
Edge Guard (2)	306B X Dr Height, cutout for hardware
Door Stop (2)	409 32D
Silencer (2)	608
Wiring Harness	QC-Cxxx (hinge to device)
Wiring Harness	QC-CxxxP (hinge/strike to junction box)

HW-3 CLOSET

Hinges (4)	McKinney	TA2714/2314
Classroom Lockset	Sargent	SG 72 8237 CRMI
SFIC Core	to match existing	
Floor Stop	441CU	26D

END OF SECTION 08 7100

SECTION 08 8000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

- 1. Interior Tempered Glazing.

1.2 DEFINITIONS

- A. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Spontaneous Disintegration of Heat Treated Glass: Developed from normal use due to nickel sulfide inclusions and not resulting from impact or practices for maintaining and cleaning heat treated glass contrary to manufacturer's written instructions.

1.3 PERFORMANCE REQUIREMENTS

- A. Glass Design: Glass thickness and type designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
 - 1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
 - 1) Load Duration: 3 seconds or less.
 - 2. Safety Glazing: Provide glass types that comply with safety glazing regulations.
- B. Thermal Movements: Provide glazing systems that allow for thermal movements without failure as specified in Division 08 Sections.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.4 ACTION SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.
- C. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
- B. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type: clear float glass, coated float glass, laminated glass, and insulating glass.
- C. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from a single manufacturer for each product and installation method indicated.
- D. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- E. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified testing agency based on testing glass products.
- F. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- G. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.
 - 1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency or manufacturer acceptable to authorities having jurisdiction.
 - 2. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. (0.84 sq. m) in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. (0.84 sq. m) or less in exposed surface area of one side, provide glazing products that

comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Glass shall be delivered to the site bearing the manufacturer's label, complete with glazing instructions where applicable.

1.7 COORDINATION

- A. Coordinate requirements for items being mounted through glass including hole locations, hole sizes, and other details. Coordinate glass thicknesses, gasket thicknesses, separation requirements, and other provisions necessary for coordination with mounted items.
- B. Coordinate requirements for glazing indicated to receive custom decorative films applied to glass under Contract including those for 'Signage' and 'Theming'. Contractor shall apply custom decorative films on existing window glazing.

1.8 WARRANTY

- A. Manufacturer's Special Warranty on Heat Treated Glass: Manufacturer's standard form, made out to Owner and signed by heat-treated glass manufacturer agreeing to replace heat-treated glass units that spontaneously disintegrate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

- 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

- A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
- B. Strength: Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

2.2 GLASS PRODUCTS

- A. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.

1. Fabrication Process: By horizontal (roller-hearth) process to eliminate tong marks with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
 - a. If, due to glass unit size limitations, roller distortion cannot be parallel to bottom edge of glass as installed, consult with Architect for determination of orientation of units in-place, which may include, at Architect's sole discretion, a change to vertical alignment for entire portions of facades, as necessary to eliminate a checker-board visual effect.
2. Provide Kind HS (heat-strengthened) float glass in place of annealed float glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
 - a. Heat strengthened glass shall be fabricated with the low end of allowable compressive strength for heat strengthened glass to ensure against tempered glass breakage pattern. Glass manufacturer shall provide quality control program and testing records to establish that this criteria has been met.
3. For uncoated glass, comply with requirements for Condition A.
4. For coated vision glass, comply with requirements for Condition C (other uncoated glass).
5. Provide Kind FT (fully tempered) float glass in place of annealed or Kind HS (heatstrengthened) complying with ANSI Z97.1, float glass where safety glass is indicated.
 - a. Fully tempered glass shall be heat soaked (checked) at glass surface temperatures of not less than 400 F for 4 hours, to convert nickel sulfide inclusions from the alpha phase to the beta phase so that glass will fracture in the test. Heat soak must comply with the European Din standard. Written warranties against nickel sulfide inclusions in lieu of heat soaking will not be accepted.

2.3 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
 1. Neoprene complying with ASTM C 864.
 2. EPDM complying with ASTM C 864.
 3. Silicone complying with ASTM C 1115.
 4. Thermoplastic polyolefin rubber complying with ASTM C 1115.

2.4 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer

rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

2.5 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

2.6 MONOLITHIC-GLASS TYPES

- A. Glass Type GL-1: Clear, fully tempered float glass.
 1. Thickness: 6.0 mm.
 2. Provide safety glazing labeling.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 2. Presence and functioning of weep system.
 3. Minimum required face or edge clearances.
 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Verify installed glass units can receive field installed glazing surface films without creating excessive heat buildup or other detrimental effect to glass units.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Apply heel bead of elastomeric sealant.
- F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Install gaskets so they protrude past face of glazing stops.

3.6 CLEANING AND PROTECTION

- A. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- B. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- C. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.
 - 1. Wash glass with glazing surface films as recommended in writing by glass manufacturer and glazing surface film manufacturer.

END OF SECTION 08 8000

SECTION 09 2216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes non-load-bearing steel framing members for the following applications:
 - 1. Non-load-bearing steel framing systems for interior gypsum board assemblies.

1.2 ACTION SUBMITTALS

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

1.3 QUALITY ASSURANCE

- A. Sound Transmission Characteristics: For STC-rated assemblies that incorporate non-load-bearing steel framing, 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.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Provide materials and construction identical to those tested according to ASTM E 119.
- B. 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.
- C. Recycled Content of Steel Products: Provide products with average recycled content of steel products such that postconsumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.

2.2 FRAMING SYSTEMS

- A. Steel Studs and Runners: ASTM C 645. Use dimpled steel studs and runners of equivalent minimum base-metal thickness.
 - 1. Minimum Base-Metal Thickness: 0.018 inch (0.45 mm).
 - 2. Depth: See drawings.

- B. Slip-Type Head Joints: Where indicated, provide the following in thickness not less than indicated for studs and in width to accommodate depth of studs:
1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (51-mm-) deep flanges, 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.
 2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- (51-mm-) deep flanges and fastened to studs, and outer runner sized to friction fit inside runner.
 3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes due to deflection of structure above.
 - a. Products: Subject to compliance with requirements, provide one of the following:
 - 1) Dietrich Metal Framing; SLP-TRK Slotted Deflection Track.
 - 2) MBA Building Supplies; Slotted Deflecto Track.
 - 3) Steel Network Inc. (The); VertiTrack VTD Series.
 - 4) Superior Metal Trim; Superior Flex Track System (SFT).
 - 5) Telling Industries; Vertical Slip Track II.
- C. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Metal Thickness: 0.027 inch (0.68 mm).
- D. Cold-Rolled Channel Bridging: Steel, 0.053-inch (1.34-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: 1-1/2 inches (38 mm).
 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.
- E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base-Metal Thickness: 0.018 inch (0.45 mm).
 2. Depth: 7/8 inch (22.2 mm).
- F. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
1. Configuration: Asymmetrical.
- G. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: 3/4 inch (19 mm).
 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch (0.8 mm).
 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.

- H. 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 mm), minimum uncoated-metal thickness of 0.018 inch (0.45 mm), and depth required to fit insulation thickness indicated.

2.3 AUXILIARY MATERIALS

- A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide foam gasket.
 - 1. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordination with Existing Sprayed Fire-Resistive Materials:
 - 1. When working at or near existing fire-resistive materials, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.

- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- 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, install to maintain continuity of fire-resistance-rated assembly indicated.
 - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Direct Furring:
 - 1. Screw to framing.
 - 2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.

F. Z-Furring Members:

1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches (610 mm) 600 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 (610 mm) o.c.
3. At 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 (305 mm) from corner and cut insulation to fit.

- G. 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.

END OF SECTION 09 2216

SECTION 09 2900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board and accessories.
2. Aluminum trim accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 QUALITY ASSURANCE

- ##### A. 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.

1.4 STORAGE AND HANDLING

- ##### A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.5 PROJECT CONDITIONS

- ##### A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- ##### B. 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.

1.6 COORDINATION

1. Division 09 Section "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board.
2. Division 09 "Painting" Sections for primers applied to gypsum board surfaces.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. 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. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.
- B. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CertainTeed Corp.
 - 2. Georgia-Pacific Gypsum LLC.
 - 3. National Gypsum Company.
 - 4. USG Corporation.
- B. Gypsum Wallboard: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch (12.7 mm).
 - 2. Long Edges: Tapered.
- C. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch (15.9 mm).
 - 2. Long Edges: Tapered.

2.4 TRIM ACCESSORIES

- A. Interior Trim, general: ASTM C 1047.
 - 1. Material: Galvanized coated steel sheet.
- B. Aluminum Trim
 - 1. Material: 6063 T5 aluminum.
 - 2. Finish: Clear anodized.
 - 3. Provide in continuous lengths of 10' minimum.
 - 4. Integral taping flange on each side of reveal.

- 5. Basis of Design manufacturer: Fry Reglet
- 6. Types:
 - a. Aluminum Reveal, DRM 50-50
 - b. Outside Corner: DRMW 50-50

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing).
 - 1. Recycled Content of Blankets: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS

- A. Comply with ASTM C 840.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

- C. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. 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.
- E. 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.
- F. Form control and expansion joints with space between edges of adjoining gypsum panels.
- G. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- I. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- J. Install 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.
 - 1. Aluminum Reveals: Install in locations indicated on Drawings.
- K. Prefill open joints and damaged surface areas.
- L. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- M. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in other Division 09 Sections.

2. Level 5: At panel surfaces to receive Idea Paint finish according to finish plan drawing.

a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

N. Protect adjacent surfaces from drywall compound and texture finishes and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

O. Remove and replace panels that are wet, moisture damaged, and mold damaged.

3.3 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. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners, unless otherwise indicated.
2. Bullnose Bead: Use at outside corners where indicated.
3. LC-Bead: Use at exposed panel edges.
4. L-Bead: Use where indicated.
5. U-Bead: Use at exposed panel edges.

3.4 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. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below:

1. Level 4: At all locations unless otherwise noted.

a. Primer and its application to surfaces are specified in other Division 09 Sections.

3.5 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 2900

SECTION 09 5113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for ceilings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.
- C. Coordination drawing of open ceiling area showing Decorative Acoustical Panels, required supports, and MEPFP equipment.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.4 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. Acoustical Ceiling Panels: Full-size panels equal to 2.0 percent of quantity installed.
 - 2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

- 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
 - 2. Smoke-Developed Index: 50 or less.

2.2 ACOUSTICAL PANEL CEILINGS, GENERAL

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 45 percent.
- B. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
- C. Acoustical Panel Standard: Comply with ASTM E 1264.
- D. Metal Suspension System Standard: Comply with ASTM C 635.

2.3 ACOUSTICAL PANELS (ACP-1)

- A. Acoustical panels are intended to match existing panels installed in facility. Verify with owner and architect prior to submitting product data.
- B. Products: Subject to compliance with requirements, provide the following:
 - 1. Basis of Design: Armstrong VL Perforated
 - 2. Size: 24" by 48"
 - 3. Thickness: 5/8 inch
 - 4. Edge Detail: Square Lay In
 - 5. Pattern: Perforated
 - 6. Type: Mineral Fiber
 - 7. Color: White

2.4 METAL SUSPENSION SYSTEM

- A. Products: Subject to compliance with requirements, provide the following:
 - 1. Armstrong World Industries, Inc.; Prelude XL" Exposed Tee 15/16"
 - a. Color: White

2.5 EDEGE MOLDINGS AND TRIM

- A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated 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.

1. Provide at spaces and areas where entire perimeter of ceiling panel area is straight or meets walls with straight segmented sections. Where any portion of perimeter of ceiling panel area in room or area is curved, provide extruded-aluminum edge moldings. Do not use roll-formed moldings with extruded-aluminum moldings in the same area.
2. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners, unless otherwise indicated.
3. For lay-in panels with reveal edge, beveled tegular, or square tegular edge details, provide L shaped angle molding. Set bottom flange of edge moldings and trim slightly above indicated ceiling height to align with runner tee flanges.

PART 3 - EXECUTION

3.1 INSTALLATION - PANELS

- A. Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and Cisca's "Ceiling Systems Handbook."
- B. Measure each ceiling area and establish layout of acoustical 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.
 1. No cut tile less than 2" wide.
- C. Suspend ceiling hangers from building's structural members, plumb and free from contact with insulation or other objects within ceiling plenum. 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. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers, use trapezes or equivalent devices. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 1. Do not support ceilings directly from permanent metal forms or floor deck; anchor into concrete slabs.
 2. Do not attach hangers to steel deck tabs.
- D. Install suspension systems at ceiling heights indicated on the Drawings and as follows:
 1. Reveal or beveled tegular edge panels: Set bottom of runner tee flanges slightly above indicated ceiling height so that bottom of beveled or tegular edge panel is at indicated ceiling height. Set bottom flange of edge moldings and trim slightly above indicated ceiling height to align with runner tee flanges.
- E. 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 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.
 4. At reveal or tegular edge panels, set bottom flange of edge moldings and trim slightly above indicated ceiling height to align with runner tee flanges.
- F. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- G. Panels
1. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings.
 2. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 3. Where panels have a factory formed edge, field cut edges to match factory formed edges and repaint filed cut edges to match panel finish. Paint to be provided by panel manufacturer.

3.2 CLEANING

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 5113

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient base.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

- B. 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.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.4 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).

1.5 PROJECT CONDITIONS

- A. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

A. Resilient Base:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

- a. Johnsonite.
 - b. Burke Mercer Flooring Products; Division of Burke Industries, Inc.
 - c. Roppe Corporation, USA.
- B. Resilient Base Standard: ASTM F 1861.
- 1. Material Requirement: Type TS (rubber, vulcanized thermoset).
 - 2. Manufacturing Method: Group I (solid, homogeneous).
 - 3. Style: Cove (base with toe) and Straight (flat or toeless).
- C. Minimum Thickness: 0.125 inch (3.2 mm).
- D. Height: 4 inches (102 mm).
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Finish: Low luster.
- I. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 INSTALLATION MATERIALS

- A. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
- 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Do not install resilient products until they are same temperature as the space where they are to be installed.

1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- C. 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. Prior to installing straight resilient base, install cove filler strips or use other suitable backer to prevent base from curling into gap between bottom edge of gypsum board and concrete floor slab. Install at space between bottom edge of gypsum board panels and concrete floor slab, and behind straight resilient base.
- C. 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.
- D. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- E. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- F. Do not stretch resilient base during installation.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
 1. Remove adhesive and other blemishes from exposed surfaces.
 2. Sweep and vacuum surfaces thoroughly.
 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products until Substantial Completion.

END OF SECTION 09 6513

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on interior substrates.
 - 1. Gypsum board.
 - 2. Steel and iron.

1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and in each color and gloss of topcoat.

1.4 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to verification of existing paint stock and products applied during last renovation, provide products by the following:
 1. Sherwin Williams.
 2. PPG Industries.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Colors: Match Architect's samples and colors applied in existing building. Color schedule in drawings is intended to be a starting point for color identification.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
 2. Fiber-Cement Board: 12 percent.
 3. Masonry (Clay and CMUs): 12 percent.
 4. Wood: 15 percent.
 5. Gypsum Board: 12 percent.
 6. Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 INTERIOR PAINTING SCHEDULE

- A. Gypsum Board Substrates to receive painted topcoat:
1. Institutional Low-Odor/VOC Latex System: Two finish coats over prime coat.
 - a. Primer: Zero VOC Interior Latex Primer
 - b. Finish Coat: Interior Latex, Eggshell
- B. Gypsum Board Substrates to receive Epoxy Paint:
1. Institutional Low-Odor/VOC Latex System: Two finish coats over prime coat.
 - a. Primer: As recommended by top coat manufacturer.

- b. Finish Coat: Interior water-based epoxy finish: PPG 16-510 Pitt Glaze Interior Semi-Gloss Acrylic Epoxy.
- C. Steel Doors and Frames:
 - 1. Acrylic Enamel: Two finish coats over shop applied primer.
 - a. Primer: Shop applied by door frame manufacturer
 - b. Finish Coat: Pro Industrial High Performance Acrylic, Semi-Gloss

END OF SECTION 09 9123