SECTION 013100
PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Coordination of Work of Contract from beginning of construction activity through Project close-out and warranty periods.

B. Related Sections:

1. Section 007200 - General Conditions.
2. Section 011100 - Summary of Work.
3. Section 013300 - Submittal Procedures.
4. Section 014500 – Quality Control.
5. Section 015200 - Construction Facilities.
6. Section 015100 - Temporary Utilities.
7. Section 017329 – Cutting and Patching.
8. Section 017700 – Closeout Procedures.
9. Section 017800 - Closeout Submittals.
10. Section 013216 – Construction Progress Schedules.
11. Section 024119 – Selective Demolition.

1.2 SUBMITTALS

A. Coordination Drawings: Submit in accordance with Section 013300, and as specified herein.

1.3 COORDINATION SCHEDULING

A. Schedule Coordination: Special coordination and cooperation efforts are required for certain interrelated phases of the work, such as:

1. Sequencing of remodeling work.
2. Construction of temporary spaces and facilities;
3. Removals and relocations of existing services and facilities;
4. Connecting the Owner's equipment;
5. Installation of and connections to new utilities;
6. Connections to existing buildings;
7. Demolition work;
8. Providing and maintaining temporary heat and other temporary facilities.

B. Coordinate scheduling, work activities, submittals, including deferred approvals (if any), Owner's separate contracts (if any), Owner’s material/product direct purchase (if any), and work of the various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

C. Coordinate sequence of Work to accommodate any Owner's separate contracts and Owner Occupancy as specified in Section 011100.

D. General: The nature of the Project makes it imperative that the Contractor and all subcontractors coordinate their work and cooperate with each other and the Owner from the start of the Project to completion.

1. The Contractor is the Prime Coordinator for the Project and shall establish the overall schedule for the progress of the Project, the sequence of completion and general use of the site.

E. Notice: Give adequate and timely notice of various work phases and operations which will affect the work of, or will require installations or other action by others.

1. After timely notification by the Contractor of the need to accomplish a particular phase or element of the Work, the Subcontractors shall, within a reasonable time, perform their work as not to delay or impede others or the progress of the Project.

F. Schedule: Set up control procedures so that approved schedules are adhered to. Contractor's responsibility is to properly notify Owner's Representative of anticipated and actual time delays.
   1. Refer to General Conditions.

G. Contractor's job superintendent shall be on the job during work activities.
   1. Refer to General Conditions.

H. The Contractor is responsible to coordinate the Work and cannot delegate responsibility for coordination to any Subcontractor.

I. The Contractor shall anticipate the interrelationship of all Subcontractors, Owner's separate contracts, and their relationship with the Work.

J. The Contractor shall resolve differences or disputes between Subcontractors concerning coordination, interference, or extent of Work between Sections.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

Not used.

PART 3 EXECUTION

3.1 SHUT DOWN PROCEDURES

A. A shutdown is any interruption of services provided by the Owner to its clients and staff. Ensure that an inspector has been assigned to coordinate shutdown in the field.

B. Determine if all proper and appropriate coordination and notification has been completed, before the shutdown.

C. Shutdown Request: Attached to the end of this section is a copy of the shutdown request form.

D. Write a final report to the Owner and Architect, in event of an unexpected incident that occurs during the course of a planned shutdown, resulting in a significant disruption or discontinuance of operations.

E. Interruption of Services: Adequate advance written notice (a minimum of fourteen (14) calendar days) shall be given to the Contractor and Owner's Construction Administrator when interruptions of services, or interferences with the use of existing buildings and roads are anticipated. Contractor’s assigned subcontractor must not interrupt any service without written notice.

F. Planned service shutdowns shall be accomplished during periods of minimum usage. In some cases, this may require work outside of normal work hours as indicated in 011100 Summary of Work, at no additional cost to the Owner.
   1. The Contractor or assigned subcontractor must program the work so that service will be restored in the minimum possible time, and shall cooperate with the Owner in reducing shutdowns of system.
   2. At least fourteen (14) calendar days advance written notice shall be given to the Owner's Representative before interruptions to service and other interferences to the use of, or access to existing buildings and facilities.
   3. Required access ways shall be kept open at all times; the use of one way traffic and detours shall be held to a minimum.

3.2 COORDINATION

A. Refer to Document 007200, General Conditions of the Contract for general requirements. Refer to other sections of Division 1 for requirements and timing relating to coordination, as well as other articles of this section.
   1. Submittals: Refer to Section 013300.
   2. Quality Control: Refer to Section 014500.
   3. Closeout Procedures: Refer to section 017700.

4. Payments: Refer to General Conditions and Supplementary Conditions and Section 012900 - Price and Payment Procedures for progress payments and for final payment, as well as requirements of this Section.

B. The Prime Contractor shall be Project Coordinator and shall coordinate and schedule all work, including with the Owner where the work of the Contract may involve or disrupt the Owner's normal functions.
   1. The Contractor and Subcontractors shall work closely in the coordination of the documents and in the timing of operations.

C. Service Connections: Except as otherwise indicated, final connection of mechanical services to general work is defined as being mechanical work, and final connection of electrical services to general work is defined as electrical work.

D. Service Shutdowns: Plan shutdowns so as to minimize shutdown time of any service. Request approval of a shutdown in writing to the Owner's Representative not less than fourteen (14) calendar days before the time that the shutdown is desired.

E. Hot Work: Consider hot work similar to utility shut downs and insure proper safety measures are in place. Welding work shall require the same notification procedures as for shutdowns.
   1. Should operations be such that the requested shutdown be delayed in excess of ten working days from receipt of subcontractor’s written request, contract time extension will only be granted for the excess period.
      a. Operation of existing valves, switches, etc. to effect service shutdowns will be made by the Contractor.
   2. Although the general location of services may be shown on the drawings or described elsewhere, neither the Owner nor the Owner's Representative warrant the accuracy of the location shown or described.
   3. Responsibility for determining the actual on-site location of services shall rest solely with the Contractor’s subcontractors.
      a. Each subcontractor must verify the location of all services before commencing work.
      b. All capping, relocation or removal of such services shall be performed by each subcontractor at no increase in contract price.

F. Coordination: The Project will require close cooperation and coordination with Owner and Contractor and Subcontractors. The Contractor must:
   1. Consider such coordination in the work.
   2. Schedule the Work with the subcontractors and the Owner throughout the Project.
   3. Keep the Owner, and Architect advised of the schedule to complete the Work.

3.3 COORDINATION/ENGINEERING DRAWINGS:

A. Contractor is responsible for providing vertical sections through floors showing structural physical restraints, architectural restraints, plenum spaces and all other physical obstructions that may affect the work.
   1. Provide for integration of the work, including work first shown in detail on shop drawings or product data.
   2. Show sequencing and relationship of separate units of work which must interface in a restricted manner to fit in the space provided, or function as indicated.
   3. Coordination drawings must be definitive and detailed in nature.

B. Facilitate Coordination Drawing meetings with Subcontractors. If the size or complexity of the project requires it, Architect will be available, along with applicable engineers, to participate in these meetings as needed.

C. Prepare complete coordination drawings 1/4 inch = 1 foot 0 inches, including plans, sections, details, etc., indicating the complete layout and all mechanical and electrical equipment in all areas and within the ceiling spaces for new and existing conditions, including bottom of duct, pipe, conduit and elevations.

D. Contractor is responsible for coordination of each trades, including General, Mechanical, Fire Protection, Plumbing, Ceiling and Electrical Subcontractors.

1. Each of these Subcontractors shall be responsible to ensure that all relevant mechanical and electrical equipment, piping, conduit, ceiling hangers, etc., is shown on coordination and will fit.
2. Each Subcontractor must include all necessary items, i.e., lights, ducts, fans, pumps, piping, conduit, etc.

E. Conflicts shall be resolved by the Contractor. Contractor is the primary source responsible for conflict resolution.

F. Electronic reproduction or photo reproduction of Architectural drawings will not be acceptable.

G. Prepare a 1/4 inch sleeving layout indicating size and location of sleeves. Trades shall indicate their requirements and location.

1. Provide copies to applicable trades and Architect.

H. At completion of work, coordination drawings shall be submitted together with record drawings of general, mechanical, electrical, plumbing and fire protection trades in accordance with Section 013300 – Submittal Procedures.

I. Review of Coordination/Engineering Drawings is for design intent only and shall not relieve the Contractor from overall responsibility for coordination of all work performed pursuant to the Contract, or from any other requirements of the Contract.

J. Debris Removal and Material Access: An area may be designated for debris removal and material access. Coordinate with Owner regarding access. At some County buildings (especially the Government Center), dock and dumpster space is limited and may require daily removal.

3.4 FLOORING COORDINATION

A. Hold a finish flooring coordination meeting. Invite suppliers and installers for concrete of each finish flooring. The purpose for this meeting is to coordinate concrete finishing, admixtures, curing compounds, moisture control and compatibility with finish flooring and adhesives.

3.5 EQUIPMENT COORDINATION

A. Install equipment in accordance with manufacturers recommendations and instructions.

1. Refer to Section 016400 - Owner-Furnished Products.

B. Equipment Coordination: With respect to mechanical and electrical features of Contractor and Owner supplied equipment, complete data must be exchanged directly between the Contractor and those vendors and subcontractors involved as the progress of the Project requires.

1. The person requesting the information shall advise when it will be required.
2. Examine Owner's existing equipment and determine the rough-in data. Owner will furnish data for equipment purchased by Owner. Unless noted otherwise, the Contractor will disconnect equipment and relocate to new space for connections by Contractor.
3. Consult Owner to verify status of rough-in data.
4. If rough-in details are not available at the time service systems are being installed, postpone final rough-in until data is available.

C. Subcontractors for casework and equipment are expressly required to provide large scale layout drawings for casework and equipment showing the required rough-in locations of all services (dimensioned from building features), service characteristics, and locations of studs where the location is critical to mounting or otherwise installing equipment and casework.

1. Furnish sizes and spacing required for mechanical and electrical cutouts, and a complete brochure of fittings, sinks, outlets, or other information to provide complete data on the items and accessories being furnished.

D. In the event of incorrect, incomplete, delayed or improperly identified information, the entity causing the delay or error shall be responsible and pay for any modifications or replacements necessary to provide a correct, proper and new installation, including relocations required.

E. Services: Rough-in sleeves for waste and other services passing through the floor shall be installed prior to pouring the floors if data is available.

1. Core drilling for holes may be done to facilitate job progress or to more accurately locate holes with permission of the Architect, without additional reimbursement.

F. Sleeves are required at core drilled holes. Where permission is obtained to omit sleeve, drill hole one inch larger than the outside diameter of the pipe or conduit, or one inch larger than outside diameter of insulation, where insulated.
   1. Refer to Section 017324 - Anchorage and Sleeving.

3.6 FIELD DIMENSIONS FOR CASEWORK AND EQUIPMENT

A. Accurate field dimensions are required in ample time to permit fabrication of casework and equipment for delivery and installation in accordance with the schedule.
   1. To obtain dimensions and to prevent fabrication delay, cooperate in completing work phases to accommodate the schedule.

B. Be responsible for obtaining correct field dimensions and informing the various fabricators before start of construction.
   1. Refer to Section 016400 - Owner Furnished Equipment.

3.7 MEETINGS

A. Pre-Construction Meeting: After award of contract, at time designated by the Owner or the Architect, the Contractor and major subcontractors shall attend a Pre-Construction Meeting.
   1. Procedures to be followed, critical work sequencing, coordination efforts and similar matters will be reviewed.

B. Progress Meetings: During construction, periodic site meetings will be held with the Contractor, major Subcontractors, Owner, and Architect.
   1. These meetings will be held biweekly and may be held more frequently if job progress and needs indicate.
   2. Contractor and major Subcontractors shall have one or more responsible representatives in attendance.
   3. Keep the "minutes" of the meeting and distribute the "minutes" to all concerned.

C. In addition to progress meetings specified herein, hold coordination meetings and pre-installation conferences with requisite personnel to assure coordination of Work specified in individual Sections..

3.8 COORDINATION OF SCHEDULES, SUBMITTALS

A. Coordinate schedules, reports, and payments as specified in Section 013300 and as specified in Section 017800.

B. Schedule and coordinate submittals specified in Section 013300 and as specified in Section 017700.

C. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate requests for substitutions to assure compatibility of space, of operating elements, and effect on work of other sections.

E. After obtaining Owner's Representative's approval, Contractor will submit any following listed documents directly to all City and State Agencies for review and approval.

3.9 COORDINATION OF SPACE

A. Coordinate use of Project space and sequence of installation of mechanical and electrical work which is indicated diagrammatically on Drawings.
   1. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building.
   2. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

B. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

C. Off-Site Fabrication: Off-site fabrication is encouraged as much as possible and deliveries scheduled so materials and equipment can be installed immediately after delivery.

1. Alert and advise others of the need to hold deliveries until they are notified the materials are required on the site.

D. Notice: Give adequate and timely notice of various work phases and operations which will affect the work of, or will require installations or other action by others.

1. After timely notification by the Contractor of the need to accomplish a particular phase or element of the Work, the Subcontractors shall, within a reasonable time, perform their work as not to delay or impede others or the progress of the Project.

E. Coordination of phases of the work: Special coordination and cooperation efforts are required for certain interrelated phases of the work, such as:

1. Sequencing of remodeling work; construction of temporary spaces and facilities; removals and relocations of existing services and facilities; ceiling work; connecting the Owner's equipment; installation of and connections to new utilities; connections to existing buildings; demolition work; providing and maintaining temporary heat and other temporary facilities; and similar work.

3.10 COORDINATION OF CLOSEOUT PROCEDURES

A. Coordinate completion and cleanup of work of separate trades in preparation for Owner occupancy.

B. After Owner occupancy of premises, coordinate access to site by various trades for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

C. Assemble and coordinate closeout submittals specified in Section 017800

END OF SECTION

REQUEST FOR FACILITIES SHUTDOWN

To:_____ Phone: _____

Date: _____

Project Name: _____

Project Number:_____ Project Superintendent: _____

Contractor Requiring Shutdown: _____

Contact Person:_____ Contact Phone:_____

Cell Phone: _____

Type Of Utility Service:

- ☐ Electrical
- ☐ Fire Alarm
- ☐ HVAC
- ☐ Hot Water Heating
- ☐ Steam
- ☐ Condensate
- ☐ Medical Gas
- ☐ Deionized Water
- ☐ Domestic Hot Water
- ☐ Domestic Cold Water
- ☐ Sanitary Sewer
- ☐ Natural Gas
- ☐ Fire Protection
- ☐ Other _____

Work Area Location: _____

Tentative Shutdown Time:_____ Month, Day, Year:_____

Approximate Length of Downtime:_____

Reason for Shutdown:_____

SECTION 013300
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Procedures for submittals.

B. Related Sections:

1. General Conditions: General Requirements.
2. Section 011100 - Summary of Work.
3. Section 013100 - Project Management and Coordination.
4. Section 013310 – Submittal Transmittal.
5. Section 017700 - Closeout Procedures.
6. Section 017800 - Closeout Submittals.

1.2 SUBMITTAL SCHEDULE

A. Prepare and submit "Submittal Schedule" within 10 days after award of Contract. Include following information.

1. Specification Section Number.
2. Type of submittal required.
3. Estimated time for submittal review.

B. Coordinate, organize and plan submittal schedule so submittals are sent with appropriate time allowed for adequate professional review and so submittals do not accumulate into unusually large groups. In no case should less than 15 working days be scheduled for submittals review.

1. Plan additional time for submittals that require time for coordination, routing and review including, but not limited to, following:
   a. Large groups of submittals.
   b. Hardware and doors.
   c. Integrated systems.
   d. Unique design elements or systems.
   e. Submittals that need to be routed to multiple disciplines and consultants.
   f. Other submittals identified by Architect.

1.3 TRANSMITTAL FORM

A. Send submittals with "Submittal Transmittal Form" Section 013310 completely filled out with appropriate information.

B. Submittals sent without properly completed "Submittal Transmittal Form" will be considered incomplete and marked "Not Accepted" and returned without review.

C. Send separate transmittal forms for each Section and separate transmittals for each type listed:

1. Shop Drawings.
2. Product Data.
3. Samples.

D. If shop drawings, samples or product data describe the same product or item, send submittals together under same transmittal otherwise send each type submittal under separate transmittals.

1.4 SUBMITTAL ACCEPTANCE

A. Refer to General Conditions for scope of submittal review and acceptance.

B. Substitutions or Contract modifications shall not be made in submittals. Exceptions and variations must be clearly noted on submittal and accompanied by the appropriate supporting forms. Follow documented procedures for substitutions or Contract modifications and send with submittal if a change is being proposed. Approval of a submittal with substitutions or modifications included but

that have not been specifically and individually approved does not constitute acceptance of the substitution and Contractor will be responsible for exception or variations not in compliance with Contract Documents.

C. For submittals need to be resubmitted after the first review, Contractor will be responsible for Architects fees for more than the second review unless otherwise agreed.

D. Maintain copies of "Approved" and "Conditionally Approved" submittals with record set per 017800.

E. "Approved" submittals have no exceptions noted. One set of accepted submittals will be returned to Contractor. Make appropriate copies for use and distribution.

F. "Conditionally Approved" submittals have exceptions noted but resubmission is not required. Make appropriate copies for use and distribution.

G. "Not Approved" submittals are incomplete and/or need corrections. Complete and/or correct and resubmit until final acceptance is obtained.

H. "Received" means submittals are for information only and have not been reviewed.

I. "Not Reviewed" means submittals were not required and have not been reviewed or were provided for information only.

1.5 CONTRACTOR'S PLAN OF OPERATION

A. Submit at Pre-Construction Conference. Refer to Section 013100.

B. Outline in writing approach to meeting schedule for completing Work.

C. Plan to include, but not limited to, following:

1. Sequence of Work.
2. Construction Schedule.
3. Schedule of Submittals.
4. Schedule of Temporary Utilities.
5. Staging requirements/street permits.
6. Normal work hours.
7. Parking exceptions
8. Material delivery coordination.
9. Name of person to be liaison to adjacent property Owners.
10. Name of duly authorized representative with whom business may be conducted in connection with administration of Contract.
11. Name of duly authorized superintendent written notices may be given in accordance with Conditions of the Contract.
12. Labor and equipment availability
13. List of Subcontractors
14. Names of contact persons with Owner, Architect and Contractor
15. Proposed schedule of Progress Meetings in accordance with Section 013100 and schedule of submittals per Section 013310 and payment requests per Section 012900, and other reports required by Contract Documents.

1.6 COORDINATION

A. Send submittals in logical groups of related items including but not limited to the following groups:

1. Submittal schedule, list of materials, list of subcontractors, schedule of values
2. Doors, frames and hardware.
3. Closeout submittals: Refer to Section 017800.

1.7 DISTRIBUTION

A. Contractor is responsible for duplication and distribution of accepted submittals including shop drawings. Exchange directly with subcontractors and others involved, not through Owner or Architect.

B. Provide and exchange submittals as needed to coordinate Work.

C. Provide copies to Owner if Owner requests copies during construction. Otherwise Owner will receive accepted submittals as part of Record Set submitted during project closeout.

1.8 ELECTRONIC SUBMITTALS

A. Electronic submittals is the preferred method of review. Follow these procedures:
   1. Provide one pdf file for each submittal to Submittals Coordinator. PDF file must be unlocked, editable and printable to accommodate electronic mark-ups or printing a hard copy from mark-up.
   2. Electronic submittals are to be complete and self contained with each item requiring Architect's action.
      a. Web links or other electronic submittals requiring Architect to surf websites or navigate to find documents on websites or posting services are not acceptable.
      b. If construction phase file hosting services or programs are used such as Prolog, Primavera or documents hosting programs may be considered subject to coordination with Architect.
      c. Such procedures should not require Architect to search for submittals but should follow procedures that are the electronic equivalent of hard copy submittals sent by Contractor to Architect in a manner acceptable to Architect.
   3. Where project data is intended to show colors, provide original hard copy only. See Product Data herein. No electronic submittals for color submittals.
   4. Submit samples according to Samples article herein. No electronic submittals for samples will be permitted.
   5. Architect will return one marked up electronic submittal for Contractor to process and distribute to subcontractors and for Owner according to Distribution article requirements herein.
   6. On each electronic submittal, provide Contractor review and approval stamp on each submittals.

1.9 SHOP DRAWINGS

A. Use of Architect's Drawings: Do not reproduce Architect's drawings (whether CADD files, electronic files, hard copy drawings or other publication method) to serve as shop drawings until Architect's written permission is received and then only under the following conditions.
   1. Use is subject to terms and conditions included in written permission.
   2. Use only where necessary to indicate general location of a specific fabricated item.
   3. Remove extraneous notes and information from Drawing before inclusion in submittal. Only show information related to fabrication, erection, installation, application of components, products or systems being produced. Do not include Architect's title block or other information identifying Architect.
   4. Submitted drawing should only include information intended to be reviewed and accepted.
   5. Refer to Summary of Work for additional information on Electronic files.

B. Drawings that include unnecessary information will be marked "Not Reviewed" or "Not Approved" and returned.

C. Shop drawings submitted without requested information and without Contractor's approval will not be reviewed and will be returned to Contractor marked "Not Approved."

D. Drawings Submittal Requirements:
   1. Submit drawings electronically.
   2. Architect will retain a copy.
   3. Provide additional copies for other contractors for purposes of information and coordination.
   4. Number in submittal sequence.
   5. Include Contractor's stamp of approval, as evidence that drawings are approved in accordance with General Conditions except that field dimensions must be verified prior to approval and submittal.
   6. Show field verified dimensions on final shop drawings and identify verified dimensions.
   7. Show actual adjacent construction and how each item coordinates with other subcontractors, trades and suppliers.
   8. Drawings must be clear, sharp and readable quality acceptable to Architect/Engineer.
   9. Provide clear space on each drawing of not less than 40 square inches for Architect's stamp.

E. Maintain accepted shop drawings as part of "Record Set." See 017800.

1.10 PRODUCT DATA AND EQUIPMENT BROCHURES

A. Provide multiple originals of brochures, cuts, etc., if they are multi-page bound catalogs which would be difficult to photocopy or if they are intended to illustrate color or other appearance characteristics which cannot be adequately represented by photocopies. Electronic information is preferred.

B. Photocopies of original brochures are acceptable except as specified above. Photo copies must be clear and readable. Unreadable or unclear photocopies will be returned "Not Accepted."

C. Provide layout drawings where necessary for field use or as required by Architect.

D. Number of Copies of Product Data:
   1. Submit electronically
      a. Architect will retain 1 copy.
   2. Number in submittal sequence.
   3. Include Contractor's stamp of approval, as evidence that drawings are approved in accordance with General Conditions (including field dimensions).
   4. Indicate field verified information as applicable.
   5. Provide clear space of not less than 40 square inches for Architect's stamp.

E. Provide an index of each page in submittal with space for notes and acceptance stamps.

F. Warranties:
   1. Where warranty is indicated, submit manufacturers' sample warranty with shop drawings.
   2. Submit actual executed warranties or guarantees per Section 017700 and 017800.

1.11 SAMPLES

A. Deliver samples of materials, equipment, assemblies and components as required by specifications to Architect/Engineer with delivery costs prepaid. At Architect's/Engineer's direction, remove samples after approval.
   1. Provide samples representative of actual product including finishes and other specified characteristics.
   2. Indicate type of construction and quality proposed for installation in Project.

B. Number Samples:
   1. Submit 3 samples unless otherwise specified.
      a. One set of samples to be retained by Architect.
      b. One set of sample to be retained by Contractor at the jobsite.
   2. Provide additional samples for other contractors for purposes of information and coordination.

C. Maintain record samples of accepted samples with other record documents at project site.

1.12 LIST OF MATERIALS

A. Submit within 10 days after award of Contract and prior to purchase.

B. Submit 1 copy of complete list of materials, products, and equipment proposed to be used to Architect/Engineer for acceptance.

C. Do not order materials or equipment until proposed list of materials is accepted.

D. Materials and equipment are subject to Architect's and Owner's acceptance.

E. Arrange list in order of specification sections and in form indicated by Architect/Engineer.
   1. Items listed shall fully conform to project requirements and specifications.
   2. Specifically identify each material, product or equipment item by manufacturer, brand and model and other identifying designations including those where only 1 material or product is specified.
   3. Name products specified by reference standards, described by performance requirements and descriptive language.
   4. Do not list "as specified."

F. Where 2 or more makes or kinds of items are named in specifications (or additional names are listed in an addendum), state which particular make or kind of each item is to be provided.

1.13 LIST OF SUBCONTRACTORS

A. Submit within 10 days after award of Contract, and prior to execution of Contract.

B. Submit with List of Materials.

C. Submit 1 copy of a complete list.

D. Do not execute subcontracts until proposed list of subcontractors is accepted by Owner, Architect and Engineers.

E. List to include the following information and be in form indicated by Architect.

1. Description of work proposed to be done by subcontract.
2. Names of subcontractors and major material suppliers proposed to perform portions of Work.
3. Names of sub-subcontractors of mechanical and electrical subcontractors.
4. Include proposed sub-subcontractors for other trades as requested by Architect and Engineers.

F. Reasonable objection may arise when, in opinion of Architect or Owner, there exists a rational belief that proposed subcontractor, sub-subcontractor or material supplier:

1. Cannot provide materials, equipment, facilities or other products as specified or required by Contract Documents;
2. Cannot provide labor and skill necessary to accomplish part of Work for which they are proposed, including but not limited to quality of work;
3. Lacks adequate and appropriate experience for that part of Work proposed, including materials or methods required;
4. Has previously failed to perform in timely or satisfactory manner, including in cooperation and in necessary services after project completion;
5. Proposes deviations in materials or methods that are unacceptable to Architect or Owner, such as proposing materials or products that were not specified or not listed in addenda;
6. Cannot satisfactorily perform part of Work for which contractor is proposed, within time schedule, due to size of organization or existing work load.
7. Cannot demonstrate ability through quality of representative work to perform part of Work for which contractor is being considered;
8. Of questionable integrity;
9. Shows evidence of similar considerations bearing on possibility of unsatisfactory performance.

G. If Owner or Architect has a reasonable objection to person or entity proposed by Contractor to do portion of Work, Contractor must submit substitute to whom neither Owner nor Architect has reasonable objection; no increase in Contract Sum shall be allowed as a result of such substitution.

H. After acceptance of proposed list, no change of subcontractor, sub-subcontractor or supplier not objected to by Architect or Owner, shall be made, except for cause acceptable to Architect and Owner.

1. In event of a proposed change, submit reasons for change, in writing, along with alternate proposed subcontractor, sub-subcontractor or material supplier.
2. Proposed change is subject to conditions of this Article and requirements of General Conditions.

1.14 CLOSE-OUT SUBMITTALS

A. Submit documents specified under Section 017700 and 017800.

B. Submit 1 hard copy and 2 disks of operating instructions and maintenance manuals to Owner at time of Owner's instructions.

1.15 OTHER SUBMITTALS

A. Provide other required submittals as specified.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 013310
SUBMITTAL TRANSMITTAL

To: Fill in Firm Name and Address
Attn: Submittals Coordinator
1234 Street
Minneapolis, Minnesota 55401
Email: Firm Email
Owner: Hennepin County
Project: **Project Name**
Commission No.:

From: (Contractor)
(Address)
(Address)
(City, State)

Submittal Date: _____
Previous Submittal Date: _____

Incomplete submittals will be returned "Not Accepted." See General Conditions and 013300 for requirements.

The following submittal(s) is (are) attached for your review as required by the Contract Documents.

SHOP DRAWINGS

___ No. copies submitted. Submit minimum 1 PDF per 013300; complete the following information:

☐Partial ☐Complete ☐Preliminary ☐Final

List _____ of _____ Drawings: _____

_____ Specification _____ Section: _____

_____ Article & _____ Paragraph: _____

Description of _____ Item: _____

_____ Manufacturer: _____

_____ Supplier's _____ Name: _____

_____ Telephone Number: _____

PRODUCT DATA AND QUALITY CONTROL

___ No. copies submitted. Submit minimum 1 PDF per 013300; complete the following information:

☐Partial ☐Complete ☐Preliminary ☐Final

List _____ of _____ Items: _____

_____ Specification _____ Section: _____

_____ Article & _____ Paragraph: _____

Description of _____ Item: _____

_____ Manufacturer: _____

_____ Supplier's _____ Name: _____

_____ Telephone Number: _____

SAMPLES

___ No. copies submitted. Submit minimum 3 copies per 013300; complete the following information:

☐Partial ☐Complete ☐Preliminary ☐Final

List _____ of _____ Items: _____

_____ Specification _____ Section: _____

_____ Article & _____ Paragraph: _____

Description of _____ Item: _____

_____ Manufacturer: _____

_____ Supplier's _____ Name: _____

_____ Telephone Number: _____

Submitted By: Company Name: _____

Phone: _____

Signature: _____

SECTION 014500
QUALITY CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Procedures to measure and report the quality and performance of construction.

B. Related Sections:

1. Refer to the General Conditions for general requirements, and technical specifications for specific testing requirements and methods.
2. Section 013300 - Submittal Procedures.

1.2 REFERENCES

A. ASTM E329 – Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

1.3 QUALIFICATIONS OF TESTING AGENCY

A. "Approved independent testing laboratory" shall mean an independent testing agency acceptable to the Owner and the Architect and possessing the professional qualifications and equipment to perform the specified tests and to evaluate and report the results.

1.4 QUALITY ASSURANCE

A. Comply with requirements of ASTM E329 and ASTM D3740.

B. Laboratory shall maintain a full-time registered Engineer on staff to review services.

C. Laboratory authorized to operate in State in which Project is located.

D. Testing equipment shall be calibrated at reasonable intervals with devices of an accuracy traceable to either NBS Standards or accepted values of natural physical constants.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 TESTING AND SPECIAL TESTING

A. Unless otherwise provided in the specifications, provide all materials, samples, mock-ups or assemblies for all tests specified in various sections of specifications, or as directed by the Architect, and pay shipping costs of such samples to laboratory or other testing location and facility.

1. Unless specified otherwise, all tests shall be made by an approved independent testing laboratory and reports provided to Architect.

B. Tests shall be provided and accomplished in accordance with the standard used as the reference for the particular material or product, unless other test methods or criteria are specified.

C. In the absence of a referenced standard, tests shall be accomplished in accordance with applicable ASTM Standards or Test Methods, current at the date of the Contract Documents.

3.2 PAYMENT FOR TESTS

A. Unless noted otherwise, tests specified will be paid for by the Contractor. If tests are noted as being paid by the Owner, tests will be paid directly to the testing laboratory by the Owner.

B. The Owner will not pay for tests to determine if a proposed material will initially meet the specified requirements.

3.3 TESTS TO DEMONSTRATE QUALIFICATION

A. In addition to tests specified, should the Contractor propose a product, material, method or assembly that is of unknown or questionable quality to the Architect, the Architect may require and order suitable tests to establish a basis for acceptance or rejection.

1. Such tests will be paid for by the Contractor, or by the Subcontractor requesting approval. "Standard" test reports on "similar" material will not be acceptable.

B. The Owner and Architect reserve the right to require certification or other proof that the material, assembly, equipment, system or other product furnished or proposed to be furnished, for this Project is in compliance with any test or standard called for.

1. The certificate shall be signed by a representative of the independent testing laboratory.

C. Any tests required to qualify the Contractor or any workmen for any phase of the work, and any test of a method, system or equipment that may be required by specification or law to qualify the item for use, shall be made or taken without additional reimbursement.

D. If exploratory work is required to determine the cause of defects, the cost of such work shall be borne by the Contractor responsible for such work if the work is found, in the judgement of the Architect to be defective.

1. If the Contractor responsible for the work is adjudged by the Architect to be not at fault, exploratory testing will be paid by the Owner.

3.4 INSPECTIONS

A. Should the specifications, Architect's instruction, laws, ordinances or any public authority require any work to be inspected or approved, give timely notice of its readiness for inspection and a reasonable date fixed for such inspection. If any work requiring inspection should be covered up without approval or consent of the approving agency, it must be uncovered for examination at Contractor's expense.

3.5 CERTIFICATES

A. Except for test reports provided and signed by approved independent testing laboratories, all certificates required by the specification shall be signed by an authorized official of the firm providing the certificate, with the signature notarized, when such certificates by the producer are acceptable to the Architect.

3.6 RETEST RESPONSIBILITY

A. Where results of required inspections, tests or similar prove unsatisfactory and do not indicate compliance of related work with requirements of the contract documents, then retests are responsibility of Contractor, regardless of whether original test was Contractor's responsibility.

B. Retesting of work revised or replaced by Contractor is Contractor's responsibility, where required tests were performed on original work.

END OF SECTION

SECTION 015620
CONSTRUCTION NOISE CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Methods and procedures to protect building occupants and surrounding area from excessive noise associated with construction work, and are referred to as the Noise Control Policy.

1.2 QUALITY ASSURANCE

A. Enforcement:

1. Monitor noise levels through measurements to establish levels in excess of 85 dBA at 50 feet, and implementing additional mitigation procedures based on recommendations of acoustical consultant.

1.3 SCHEDULING

A. Schedule construction work generating disruptive levels of noise in advance, and set times as required and determined acceptable by Owner. Very early morning work and/or evening and weekend work may be required in extremely sensitive inhabited or occupied spaces. See 011100 Summary of Work for building hours.

PART 2 PRODUCTS

2.1 CONSTRUCTION NOISE ASSESSMENT

A. Construction Noise levels at a distance of 50 feet for each phase of construction are shown below. Data are based on data for similar construction activities and published data.

PART 3 EXECUTION

3.1 MITIGATION

A. Attempt to implement the following construction noise mitigation measures on this Project:

1. Erect barriers around noise generating operations.
2. Turn off engines and compressors when not in operation; no idling.
3. Define truck routes to confine noisy trucks to streets that currently have the heaviest traffic. Develop a truck staging area away from acoustically sensitive areas.
4. Pre-cut metal decks and metal studs off site to minimize on-site sawing.
5. Retain an acoustical consultant to provide assistance with developing additional noise attenuation techniques where needed.
6. Avoid hammer drilling; use coring bits, instead. Avoid using power-actuated fasteners; use concrete screws, instead. Avoid sand blasting.
7. Avoid sheet metal debris chutes; use plastic chutes.

B. Contractor is responsible for site supervision of potential sources of noise (e.g., material delivery, shouting, debris box pick-up and delivery) for all trades. Maintain awareness among trades of noise sensitivity of Project.

END OF SECTION

SECTION 017329
CUTTING AND PATCHING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cutting, demolition, removal, patching and restoration of Work to accomplish and complete Work under this Contract.
   2. Relocation or reuse of existing materials, equipment, systems, or other work, as well as disposition of salvaged materials or debris.
   3. This Section applies to each subcontractor under this Contract.

B. Related Sections:
   1. Section 024119 – Selective Demolition.

1.2 DESCRIPTION

A. Drawings show design intent for scope of demolition, removals, relocations and cutting. Drawings may not show or indicate each Work item needed and may not indicate each condition or detail encountered to accomplish Work of this Contract.
   1. Examine spaces to determine actual conditions and requirements. Perform removal, demolition, cutting, restoration, new installations and other Work to accomplish new conditions required under Contract including connection of new to existing.

B. Each trade is to perform demolition, cutting, removals, relocations, patching and restoration required to accomplish Work under each Subcontract.
   1. Mechanical Subcontractor removes or relocates piping, ductwork and other items typical to its trade.
   2. Electrical Subcontractor removes or relocates panelboards, conduit, lighting and other items typical to its trade.
   3. General Construction demolishes and removes abandoned or unwanted electrical or mechanical materials and other general construction items in space.

1.3 SUBMITTALS

A. Schedule: Submit schedule indicating proposed sequence of operations for demolition work to Owner and Architect for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.
   1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
   2. Coordinate with Owner's continuing occupation of portions of existing building and with Owner's partial occupancy of completed new addition.

1.4 QUALITY ASSURANCE

A. Skilled Mechanics: Accomplish all work of cutting, removal, demolition, relocation, patching and other restoration by using only mechanics skilled in the trade. If necessary, sublet the work to skilled contractors or subcontractors.

B. Hazardous Substances: If removals, demolition, cutting and similar work results in discovery or impact to possible hazardous substances and/or harmful physical agents, such as asbestos fibers, or polychlorinated biphenyl (PCB), avoid damage to hazardous substance and protect safety of persons. Immediately notify Owner and Architect in accordance with provisions of AIA General Conditions.

C. Remove resilient sheet vinyl and resilient tile and cutback asphaltic adhesives in accordance with Resilient Floor Covering Institute (RFCI) "Recommended Work Practices for the Removal of Resilient Floor Coverings", July 1990.

1.5 COORDINATION

A. Coordination: Coordinate Work of this Section with each subcontractors so Work will progress without interruption and minimum delays. Contractor must also coordinate and schedule Work with Owner where possible disturbance may occur and where relocations or other potential disruptions of Owner's functions and services may occur. Work affecting Owner's functions and services shall be performed at times acceptable to Owner.

PART 2 DISPOSITION OF MATERIALS

2.1 UNSALVABLE MATERIALS

A. Remove unsalvable materials in a manner that will avoid damage to materials or equipment which will remain. Completely remove and legally dispose away from the site.

2.2 SALVABLE MATERIALS TO BE RE-USED IN THE WORK

A. Salvable materials and items designated for reuse or relocation shall be removed by the applicable trades and relocated to the new location. If the new location is not ready to receive the relocated item, it shall be stored and protected from damage until incorporated into the new work or remodeled area. If the Owner is unable to forego the use of any existing items at the normal time for relocation until other facilities are available to the Owner, make all preparations for the item and delay relocation until a time approved by the Owner.

B. Carefully remove, salvage, clean and preserve materials, equipment and other items indicated to be reused, or which will be needed for reuse to match existing work. Exercise extreme care in removals to prevent damage or to make materials unsuitable to reuse. For materials shown or called for to be reused and which are damaged, replace with equivalent and matching work.

2.3 SALVABLE MATERIALS TO BE STORED BY THE OWNER

A. The Owner will mark or tag existing materials, equipment or other items Owner wishes to retain. Salvable materials and items designated or marked to remain the property of the Owner shall be carefully removed by the applicable trades, protected from damage and stored adjacent to the removal area as directed.

B. Consult the Owner for any salvage the Owner may wish to retain and the salvageability of all items. Carefully remove and salvage any materials the Owner wishes to retain. Remove finish hardware from the item or material taken out of the building and turn over to Owner. Cleaning or restoration of the Owner's salvage materials is not required.

C. If off-site storage is required by the Owner, removal from the area and the site to the Owner's storage will be by the Owner.

PART 3 EXECUTION

3.1 INSPECTION

A. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

B. After uncovering, inspect conditions affecting performance of work.

C. Beginning of cutting or patching means acceptance of existing conditions.

3.2 TEMPORARY PROTECTION

A. Provide temporary bracing, shoring, needling and support during demolition, cutting, remodeling and related new construction as necessary for the execution of the Work and the protection of persons and property. Perform all work with appropriate supports, protection and methods to prevent collapse, settling or damage to property or persons. Provide adequate supports for the loads to be carried, with loads properly distributed, including to lower levels and sound bearing, if necessary.

B. Provide protective coverings and enclosures necessary to prevent damage to existing spaces and materials to remain. Protect openings in exterior walls and roofs so as to prevent damage from water and the elements and prevent excessive heat loss from the existing buildings. Coordinate work and removals at exterior, including roof, by scheduling and performing to maintain watertight installation. Seal areas left temporarily unfinished to prevent damage to existing roof or other materials and furnishings of existing building.

C. Provide dustproof temporary enclosures (including above ceilings) separating areas under demolition and remodeling from the remainder of the building as well as temporary filters at duct work. Provide temporary hinged doors in temporary enclosures where necessary. Temporary and permanent doors shall be completely sealed with tape or other suitable material during demolition work and shall remain sealed until dust has settled.

D. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching work, and maintain excavations free from water.

3.3 DEMOLITION AND CUTTING

A. Demolish and remove existing construction as shown, indicated or required to be removed to accomplish the Work. Where new Work is to be installed in or adjacent to existing construction or existing work is to be replaced, remove or cut the existing construction as necessary to complete the Work of the Project.

B. Execute work with care. Existing construction that is to remain which is loosened, cracked, or otherwise damaged or defaced as a result of the Work and is unsuitable for use intended shall be removed and replaced at no additional cost to the Owner.

C. Debris from upper levels shall be transported to ground in covered chute or other approved means. No free-fall debris removal is permitted. Take all precautions to minimize dust.

D. Clean demolition areas and remove debris, waste and rubbish from the building at the conclusion of each day's work. Transport debris and rubbish in such a manner so as to prevent spread of dust. Do not store or permit debris storage at site. Do not burn debris, rubbish or waste at the site. Keep adjacent areas unencumbered and clean. Keep walks and similar areas broom clean.

3.4 PATCHING, REMODELING, REPLACEMENTS AND RESTORATION

A. Patch or otherwise restore disturbed existing construction as indicated on Drawings and schedules, or as otherwise required to restore the work and surfaces. Patching or restoration shall be carried to natural breaks (i.e., corners) wherever possible. Where existing construction is removed, cut or otherwise disturbed by Work of the Project, patch defective and incomplete surfaces. Repair damage to existing construction which is to remain.

B. Patching work shall be done by skilled mechanics experienced in the particular type of work involved. Patching work shall conform to the standards of the Specifications where applicable and where not specified, work shall conform to the highest standards of the trade.

C. Patch existing construction to match existing work (unless otherwise called for) except provide new materials and accomplish as for new work. Examine existing surfaces to be patched before proceeding with the work. Report all conditions where existing materials, colors and finishes cannot be matched to the Architect and Owner, and do not proceed until instructions have been given.

D. Existing construction that has been damaged as a result of the Work shall be repaired to an extent and as required to match adjacent existing undamaged construction.

E. Thoroughly clean and prepare all surfaces to receive new finish or covering. Completely remove dirt, dust, grease, oil, paint, loose materials and soil. Clean, etc where necessary, and place surfaces in most suitable condition for the finish.

3.5 ADJUSTMENTS

A. Where partitions are removed, patch floors, walls, and ceilings, with finish materials to match existing.

1. Where removal of partitions results in adjacent spaces becoming one, rework floors and ceilings to provide smooth planes without breaks, steps, or bulkheads.

2. Where extreme change of plane of two inches or more occurs, request instructions from Architect as to method of making transition.

B. Trim and refinish existing doors as necessary to clear new floors.

3.6 MECHANICAL AND ELECTRICAL WORK EXPOSED

A. Where unknown mechanical piping, ductwork or electrical conduit is exposed during removal of partitions, walls or floors and ceilings, the removal or rerouting shall be accomplished by the Mechanical or Electrical Subcontractor as applicable. Locate mechanical and electrical work where directed and connect to maintain all functions in proper operation. Abandoned piping may be left in place where it is concealed in floors or walls, providing that it is disconnected from its source and capped. There shall be no "dead end" water, sewer, gas, or vent piping existing in the completed work.

B. Accomplish removals, capping or otherwise terminating services which are abandoned or need to be abandoned, and rerouting of mechanical and electrical work without additional cost to the Owner, whether shown or noted on drawings or otherwise encountered.

3.7 WORK AT EXISTING ROOF

A. Verify with the Owner to ascertain the existence of an existing roof bond or guarantee. Cutting and patching of existing building roof shall be performed with compatible materials using methods so as not to invalidate any current bond or guarantee. Cutting of all openings through roof shall be done by manufacturer's licensed or approved roofing contractor. Arrange with the manufacturer who furnished the roof bond or with the roofer who provided the roof guarantee for an examination of the complete work and provide two copies of an acknowledgement and/or approval to the Owner indicating that such bond or guarantee (if any) will remain in effect.

B. Spud off gravel about 4 feet back from roof penetration at areas indicated on roof plan and/or details at existing roof construction. Remove and patch materials to extent indicated. Feather roofing plies back, down to existing insulation; remove cut or damaged insulation and provide new insulation where required. New felts shall overlap each other and stagger back onto existing roof at successive plies. Provide at least four (4) plies. Flood coat new roof membranes and re-gravel where required.

C. At existing membrane roof system, cut and patch membrane and insulation as required at penetrations. Remove and patch materials to extent indicated. Remove cut or damaged insulation and provide new insulation where required. Re-gravel where required.

3.8 WORK OF EACH CONTRACT

A. The Contractor and each subcontractor must carefully review the Contract Documents including those primarily for other trades with respect to the coordination of the demolition, removal and remodeling work and perform such removals normal to their trades as may be shown, noted or otherwise required. Cutting and patching incidental to demolition, removal and/or remodeling of general construction work shall be construed as the work of the General Contractor when shown or indicated on the general construction drawings or schedules or specifically noted or called for on documents primarily for other trades as being accomplished by the General Contractor. Other subcontractors (mechanical or electrical) are responsible for such other cutting, demolition, patching, replacement and restoration as may be required to accomplish their part of the Work.

3.9 PAINTING

A. Each major subcontractor (mechanical, electrical) shall be responsible for painting or repainting of patched or remodeled areas where they have performed work, except for those areas shown or required to be remodeled under the general construction drawings, specifications or schedules, in which case, the new, patched and remodeled paintable surfaces shall be repainted by the General Contractor. It is the intent that the mechanical and electrical subcontractors are responsible to paint or repaint surfaces at locations where demolition, cutting and patching has been accomplished only for their work.

B. Painting, including preparation, materials, workmanship and number of coats shall comply with Section 099000 - Painting. Painting of surfaces patched shall extend to natural breaks, such as corners, as approved by the Architect and Owner.

3.10 FLOOR PREPARATION (EXISTING SLABS)

A. Prepare existing concrete slabs for the installation of various floor finish materials, i.e., VCT, ceramic and quarry tile, carpet (glue-down), concrete topping.

B. Roughen surfaces which are glossy or which have loose surface material or curing sealers by sanding, scarifying or acid etching as required. Remove surface material that is not compatible with adhesive. Clean thoroughly to remove all oil, dirt, sealer materials and dust.

3.11 CLEANING

A. Perform periodic and final cleaning as specified in Section 017700 - Closeout Procedures.
   1. Clean Owner-occupied areas daily.
   2. Clean spillage, overspray, and heavy collection of dust in Owner- occupied areas immediately.

B. At completion of work of each trade, clean area and make surfaces ready for work of successive trades.

C. At completion of alterations work in each area, provide final cleaning and return space to a condition suitable for use by Owner.

END OF SECTION

SECTION 017420
CONSTRUCTION WASTE DISPOSAL AND RECYCLING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: This Section includes required recycling and recovery of the following waste materials and applies to listed waste materials produced during the Work:

1. Concrete and Masonry: Clean concrete, brick, rock, and masonry.
2. Metals: Metal scrap including iron, steel, copper, brass, and aluminum including piping, fasteners, wiring, ductwork and sheet metal goods.
3. Untreated Wood: Unpainted, untreated dimensional lumber, timber beams, engineered wood products, plywood, oriented strand board, Masonite, particleboard, wood shipping pallets, and crates.
4. Gypsum Wallboard Scrap: Excess drywall construction materials including cuttings, other scrap, and excess materials.
5. Paper and Cardboard: Discarded office refuse including unwanted files, correspondence, etc. Clean, corrugated cardboard used for packaging, etc.

B. Non-Recyclable Waste: Collect and segregate non-recyclable waste for delivery to a permitted landfill site.

1. Mixed Solid Waste: Solid waste commonly collected as a municipal service, exclusive of waste materials listed above.

1.2 DEFINITIONS

A. Waste Materials are defined as large and small pieces of listed materials which are excess to contract requirements and generally include materials to be recycled and/or recovered from existing construction and items of trimmings, cuttings and damaged goods resulting from new installations, which cannot be effectively used in the Work.

B. Recycling is defined as the process of collecting and preparing recyclable materials and reusing them in their original form or in manufacturing processes that do not cause the destruction of recyclable materials and reusing them in their original form or in manufacturing processes that do not cause the destruction of recyclable materials in a manner that precludes further use.

C. Recovery is defined as any process that reclaims materials, substances, energy, or other products contained within or derived from waste on-site. It includes waste-to-energy, composting, and other processes.

1.3 SUBMITTALS

A. Construction Waste Management Plan: Before start of construction, submit a construction waste management plan for approval of Contracting Officer's Representative indicating how Contractor proposes to collect, segregate, recycle, and recover at least 75% of construction wastes and debris generated by the Work. Submit documentation indicating compliance with regulations specified under "Quality Assurance" article below. Include a list of recycling facilities to which indicated recyclable materials will be sent for recycling. Identify materials that are not recyclable or otherwise recoverable that must be disposed of in a landfill or other means acceptable under governing State of Minnesota and local regulations. List permitted landfills and/or other disposal means to be employed. Indicate instances where compliance with requirements of this specification does not appear to be possible and request resolution from the Contracting Officer through the Contracting Officer's Representative.

B. Delivery Receipts: Provide to the Construction Quality Manager delivery receipts for waste materials salvaged and sent to permitted waste materials processors or recyclers within 48 hours of delivery that indicate the location and name of firm accepting recyclable waste materials, types of materials, net weights of each type, date of delivery and value of materials.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with applicable requirements of the State of Minnesota and applicable local ordinances and regulations concerning management of construction, demolition, land clearing, inert, and yard trash debris and subsequent modifications and amendments to same.

B. Disposal Sites, Recyclers, and Waste Materials Processors: Use only facilities properly permitted by the State of Minnesota, and by local authorities where applicable.

C. Pre-Construction Waste Management Conference: Prior to beginning work at the site, schedule and conduct a conference to review the Construction Waste Management Plan and discuss procedures, schedules and specific requirements for waste materials recycling and disposal. Discuss coordination and interface between Contractor and other construction activities. Identify and resolve problems of compliance with requirements. Record minutes of the meeting, identifying conclusions reached and matters requiring further resolution. Maintain waste management as an agenda item at future construction meetings.

   1. Attendees: Contractor and related Contractor personnel associated with work of this section, including personnel in charge of the waste management program; Construction Quality Manager; Architect; material suppliers where appropriate; and such additional Owner personnel as Owner deems appropriate.
   2. Plan Revision: Make revisions to Construction Waste Management Plan agreed upon during the meeting and incorporate resolutions agreed to be made subsequent to the meeting. Submit revised plan to Architect for approval.

D. Implementation: Designate an on-site party responsible for instructing workers and implementing Construction Waste Management Plan. Distribute copies of Construction Waste Management Plan to job site foreman and each subcontractor. Include waste management and recycling in worker orientation. Provide on-site instruction on appropriate separation, handling, recycling, and recovery methods to be used by all parties at the appropriate stages of the work at the site. Include waste management and recycling discussion in pre-fabrication meetings with subcontractors and fabricators. Also include discussion of waste management and recycling in regular job meetings and job safety meetings conducted during the course of work at the site.

1.5 STORAGE AND HANDLING

A. Site Storage: Remove materials for recycling and recovery from the work location to approved containers or storage area as required. Failure to remove waste materials will be considered cause for withholding payment and termination of Contract.

B. Position containers for recyclable and recoverable waste materials at a designated location on the Project Site. If materials are sorted on site, provide separate collection containers or storage areas for not less than the following materials:

   1. Concrete and masonry.
   2. Metals.
   3. Untreated lumber.
   4. Gypsum wallboard scrap.
   5. Paper and cardboard.

C. Change-out loaded containers for empty containers as demand requires.

D. Handling: Deposit indicated recyclable, and recoverable materials in storage areas or containers in a clean (no mud, adhesives, solvents, petroleum contamination), debris-free condition. Do not deposit contaminated materials into the containers until such time as such materials have been cleaned.

E. If the contamination chemically combines with the material so that it cannot be cleaned, do not deposit into the recycle containers. In such case, request resolution by the Construction Quality Manager for disposal of the contaminated material. Directions from the Construction Quality Manager do not relieve the Contractor of responsibility for compliance with all legal and regulatory requirements for disposal, nor shall such directions cause a request for modification of the Contract.

1.6 PROJECT/SITE CONDITIONS

A. Environmental Requirements: Transport recyclable and recoverable waste materials from the Work Area to containers and carefully deposit in the containers without excess noise and interference with other activities, to minimize noise and dust.

1. Do not place recyclable waste materials on the ground adjacent to a container.

B. Existing Conditions: Coordinate with “Instructions to Bidders” and “Supplementary Conditions”.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 WASTE MANAGEMENT

A. General: Implement waste management procedures in accordance with approved Construction Waste Management Plan. Maintain procedure throughout the life of this Contract.

B. Source Separation On- or Off-Site: Either separate, store, protect, and handle at the project site all identified recyclable and recoverable waste products to prevent contamination of materials and maximize recycleability and recoverability of materials. Or mix all identified recyclable and recoverable waste products for separation off-site.

C. Arrange for the regular collection, transport from the site, and delivery to respective approved recycling centers of indicated recyclable waste materials. Maintain records accessible to the Architect and Owner for verification of construction waste materials recycling and recovery.

D. Delivery Receipts: Arrange for timely pickups from the site or deliveries to approved recycling facilities of designated waste materials to keep construction site clear and prevent contamination of materials. Keep and maintain records of deliveries to recycling facilities and pickups of waste materials at the site by others as specified above.

3.2 RECYCLABLE WASTE MATERIALS HANDLING

A. General: the following paragraphs supplement handling requirements for various materials identified for classification and recycling listed in Part 1 “Summary” article above.

B. Concrete and Masonry: Free of metals, woods and other contaminates. If possible during demolition, crush existing concrete and concrete masonry units on-site into aggregate size. Store crushed material on-site in clean area to avoid contamination from other materials or building processes. Reuse on-site crushed material for fill, for stabilizing soils, or as base and subbase materials. If crushing on site is impractical, store material during demolition processes on site in clean, uncontaminated area. Transport concrete and masonry materials to a certified concrete recycler as needed.

C. Metals: Cut items to lengths and sizes to fit within the container provided when necessary. Where there is sufficient quantity of a specific recyclable waste item (for example; salvaged metal roofing or duct work), make special arrangements for items to be bundled, banded or tied, and stack in a designated location for a special pick-up. Coordinate special arrangements with the Construction Quality Manager.

D. Untreated Wood: Salvaged wood materials to be free of metals, concrete, gypsum wallboard, insulation, and other contaminating materials. Stack dimensional wood into like piles. For example, store 2 x 4s with other 2 x 4s, and 2 x 6s with other 2 x 6s. Also, if quantity is sufficient, separate piles into lengths of 4-foot increments. Reuse lumber on site as studs, backing, blocking or other uses where appropriate. Stack non-dimensional wood in piles for possible reuse on-site or transport off-site. Depending on size of lumber, recycle or chip wood for plant mulch. If wood materials cannot be used on site, transport to a certified wood recycler or reuse center.

E. Gypsum Wallboard Scrap: Separate gypsum wallboard from other wastes. Dispose of waste gypsum wallboard off-site at a gypsum reclamation or recycling facility, or on-site as a soil amendment.
   1. For on-site application as a soil amendment, incorporate waste gypsum wallboard in landscape areas under construction, at a rate of 50 pounds per 1000 square feet, or approximately one ton per acre.
      a. Material must be unpainted gypsum wallboard from new construction, ground to reduce material to a fine particle size (70% passing a 100-mesh screen), and must be fully incorporated into the soil surface.

F. Paper and Cardboard: Classify and handle waste paper goods as follows:
   1. Bond Paper: General office quality paper used for specifications, correspondence, copiers, PC laser printers, and FAX machines. Collect in separate container at each workstation and deposit loose in appropriate recycle container as required.
   2. Newsprint: Newspapers and tabloid style advertising (slick finish magazines and advertising materials are not typically recyclable). Collect in single location and deposit as required in appropriate recycle container.
   3. Diazo Prints (drawings): Set up single location for collection. Roll together to minimize space. Deposit as required in appropriate recycle container.
   4. Cardboard and paperboard cartons and boxes: Knock-down, fold flat, and deposit in appropriate recycle container.

G. Other Items: Where recyclability classification of any given waste material is unclear, verify with the Construction Quality Manager.

END OF SECTION

SECTION 017700
CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Closeout procedures.
2. Systems and equipment testing.
3. Instructions to Owner.
4. Clean-up.

B. Related Sections:

1. Section 013100 – Project Management and Coordination.
2. Section 013216 – Construction Progress Schedule.
3. Section 015100 – Temporary Utilities.
4. Section 015200 – Construction Facilities.
5. Section 017800 – Closeout Submittals.

1.2 SUBSTANTIAL COMPLETION AND OWNER OCCUPANCY

A. Owner has urgent need to occupy Project to commence its intended use.

B. Plan an efficient, orderly and coordinated completion process including organizing, scheduling and coordinating the following:

1. Work of contractor's own forces.
2. Work of subcontractors.
3. Establish firm commitments for on-time completion
4. Owner's needs for accommodations and time to occupy project during closeout per schedule of Substantial Completion and final completion specified in Section 013216.

C. After Substantial Completion expedite completion of remaining work in an organized, efficient manner that maintains quality standards. Perform such work according to following requirements:

1. Scheduled work in advance with Owner.
2. Perform Work in occupied spaces when space is not in use, such as after hours in administrative areas or public spaces when public use hours are over for the day, unless otherwise approved by the Owner.
3. When necessary, use overtime to accomplish work not able to be completed during normal work hours at no extra cost to the Owner.
4. Perform Work in occupied areas in a manner and at such time as will not significantly interfere with, hamper or inconvenience Owner's program or functions.

1.3 PROJECT CLOSEOUT

A. Insurance: Refer to General Conditions.

1. Upon completion of work and written acceptance by Owner, provide a Certificate of Insurance indicating specified Completed Operations insurance will be provided a minimum of one year after Owner's acceptance of entire Project.
2. Specified Property Insurance shall be maintained until final acceptance by Owner of entire Project.

B. Supplemental Agreements: Resolve supplemental agreements prior to final payment, including adjustment of allowances.

C. Consent of Surety: Refer to General Conditions – obtain consent of surety prior to reduction in retained percentage and prior to final payment.

D. Broken Glass: Repair.

E. Guarantees - Warranties: Refer to General Conditions for general guarantee requirements.

1. In addition to general guarantee, provide written guarantees specified in technical sections of Specifications per Section 017800.

F. Test Reports and Certificates: Refer to Section 017800.

G. Retention of Records: Retain records required by law and good business practice.

H. Record Set of Drawings:
   1. Refer to General Conditions and Section 017800.
   2. Deliver record set to Architect upon Final Completion of Project.

I. Temporary Utilities:
   1. Refer to Section 015100.
   2. Remove temporary facilities and utilities as job progress permits.
   3. Read meters at times specified for transfer of services cost from Contractor to Owner for light/power.

J. Sanitary Facilities:
   1. Refer to Section 015200.
   2. Remove temporary fixtures and restore rooms as specified.

K. Temporary Facilities:
   1. Remove as work progresses and facilities are no longer needed at time acceptable to Architect.
   2. Prior to final payment, remove temporary sheds, offices, fences (including perimeter fence), barricades, surplus materials, debris and other material or items not part of Project.

L. Extra Materials: Refer to Section 017800

M. Construction Cores and Keys:
   1. At time of Substantial Completion, just prior to occupancy, replace construction cores and install permanent cores in locks.
   2. Thereafter, access to spaces will be provided by the Owner.

N. Identification of Equipment:
   1. Prior to Substantial Completion, provide identification tags or plates, or other identification means, as specified under Technical Sections of Specifications, such as at valves, panelboards and similar items.
   2. Apply directions on plates for circuit data and similar information.

1.4 SYSTEMS AND EQUIPMENT TESTING

A. Test equipment and systems to demonstrate each system and piece of equipment is installed and operating properly.

B. Provide a written record of tests and results per Section 017800.

C. After operation and testing of systems, instruct Owner's representatives with Architect's representative present.

1.5 INSTRUCTIONS TO OWNER

A. Provide instructions before final payment is made. Submit evidence that instruction/maintenance manuals were delivered to and were acceptable to Owner.

B. Requirements herein supplement specific requirements provided under individual specification sections.

C. Collect information and data so complete manuals are provided in sufficient time to permit review prior to time for final payment. Refer also to Section 017800.

D. Provide qualified representatives of Contractor or subcontractors to give explanations and instructions.

E. Provide instruction manuals per Section 017800 to be used and reviewed during instructions.

F. Thoroughly and properly instruct the Owner in use, operation, care and maintenance of Project, especially various systems and equipment installed under Contract. Give instructions methodically and carefully. Cover various phases of work and in sufficient detail so Owner fully understands entire Project.

G. Orient and familiarize designated Owner Representatives with locations, methods, materials, uses and operation of systems and equipment, as well as specialized materials installed under Contract.

H. Instruct and demonstrate to the Owner regarding full use, sequence or function and similar information to fully acquaint Owner in proper use, care and control of equipment, systems and devices installed under Contract.

I. Precautionary Measures and Dangers of Misuse.
   1. Specifically explain precautions and dangers of misuse.
   2. Establish specific and agreed upon periods of time with the Owner, adequate to thoroughly present pertinent information.
   3. Owner will record length of time and number of days spent on these instructions.

J. Refer to Section 013100 for additional information and data for maintenance manual such as coordination drawings.

1.6 CLEAN-UP

A. Refer to General Conditions for cleaning requirements during construction.

B. Clean materials and equipment. Remove (haul away) debris, cartons, crates, surplus materials.

C. Maintain work neat and orderly.

D. Definitions
   1. Thorough Cleaning:
      a. Thorough cleaning required unless otherwise specified.
      b. Remove dust, dirt, debris, laitance, grease, oil, stains, discolorations, droppings, markings, and other soil or foreign matter or substance.
      c. Remove labels except labels specifically designated to remain as part of listed, rated or labeled item.
      d. Use appropriate methods such as sweeping, scrubbing, mopping, washing, dusting vacuuming so surface is completely clean and streak free.
   2. Broom Clean: Remove visible dirt or dust from surface with a new, high quality, clean broom by thoroughly and properly sweeping or brooming so no dust or dirt is visible on surface.

E. Perform general "final" cleaning prior to inspection for Substantial Completion and occupancy. Plan, organize and coordinate cleaning to avoid working in spaces once cleaned. Coordinate timely cleaning with Architect especially for cleaning of glass.

F. Clean entire Project including, but not limited to:
   1. Cleaning required under each Section.
   2. Remove accumulated dust, dirt and debris.
   3. Materials, equipment or other items.
   4. Glass - both sides, interior and exterior, and mirrors.

G. Electrical Subcontractor Cleaning: Includes but is not limited to:
   1. Normally occupied areas, service areas, passages and corridors and similar spaces.
   2. Interiors of cabinets, panelboards and other equipment.
   3. Other work under contract needing cleaning.

H. Mechanical Subcontractor Cleaning: Includes but is not limited to:
   1. Remove filters used during construction and install permanent new filters.
   2. Ductwork.
   3. Fixtures and fittings.
   4. Insides of convectors.
   5. Unit heaters or similar units
   6. Radiation.
   7. Piping and equipment in equipment rooms
   8. Other work under contract needing cleaning.

I. "Broom Clean" is allowed in following areas:
   1. Tunnels, shafts, air shafts and air plenums not constructed of ductwork
   2. Similar areas.
   3. Floors in equipment rooms (including rooms such as electrical equipment rooms)
      a. Except also wash floors and apply final coat of sealer if specified.

J. Floors (including concrete) must be free of stains and discoloration

K. Hardware: Adjust and polish as needed

L. Perform other cleaning as required to turn the Project over to the Owner in new, well maintained condition, ready for full use and occupancy.

M. Clean areas made dirty by work done after Substantial Completion so building is clean as specified prior to Final Completion.

1.7 FINAL ACCEPTANCE AND FINAL PAYMENT

A. Final payment will not be made until final acceptance inspection, completion of punch list items and final sign-off by Owner and Architect.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 017800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Closeout submittals.
2. Warranties and guarantees.
3. Test reports and certificates.
4. Extra materials.
5. Maintenance manuals.
6. Record drawings and specifications.

B. Related Sections:

1. Section 013300 - Submittal Procedures.
2. Section 017700 - Closeout Procedures.

1.2 WARRANTIES AND GUARANTEES

A. Provide written guarantees specified in technical sections of Specifications.

B. Where guarantee terms are included in Specifications or a specific guarantee is referenced, submit guarantee in specified form.

C. Submit guarantees prior to final payment.

D. Submit a checklist of required guarantees, by section numbers.

1.3 TEST REPORTS AND CERTIFICATES

A. Provide test reports and certificates required in technical sections prior to final payment.

B. Provide a written record of systems and equipment testing and results.

C. Provide a check list of required reports and certificates, by Specifications sections.

1.4 EXTRA MATERIALS

A. Prior to final completion, deliver extra materials specified in various technical sections.

B. Do not allow materials to "collect" in various parts of Project. Deliver to Owner together.

C. Obtain receipt for specified extra materials. Without such evidence of delivery, no credit will be given for fulfilling specified requirements.

D. Provide a checklist of specified extra materials.

1.5 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. Coordinate submittals from Section 013300 that will be needed to fulfill following requirements.

B. Provide operating instruction data and maintenance manuals in accordance with Section 017700 - Closeout Procedures.

C. Organize information by classes or types of equipment and systems as follows:

1. Manuals shall consist of neatly edited and typed instruction manuals (in 1 hard copy and 2 electronic copies on a disk) to explain use, function and control of equipment, materials and systems. Printed information shall include:
   a. Warranties and guarantees.
   b. Common errors made, which will "abuse" equipment or system
   c. Use, function and control of equipment and systems
   d. Clean installation data and pamphlets (not to be left at equipment but included in manuals)

e. Instructions and explanations.
f. Cleaning instructions.
g. Wiring and piping diagrams.
h. Various types of maintenance procedures.
i. Lubrication data and schedules.
j. Maintenance materials to be used.
k. Maintenance information.
l. Maintenance instructions with frequency.
m. Other maintenance information.
n. Adjustment and repair data.
o. Parts list with numbers and recommended parts for Owner's stock.
p. Names, addresses, and telephone numbers parts distributor.
q. Names, addresses, and telephone numbers of appropriate service organizations for various items and equipment.

2. Manuals shall include systems and equipment as specified, but not limited to following information:
   a. Heating and ventilating equipment
   b. Fan units
   c. Air conditioning
   d. Controls for mechanical systems
   e. Alarm systems
   f. Electrical distribution systems
   g. Operating equipment of general construction
   h. Mechanical and electrical work
   i. Power operated doors
   j. Other similar systems and equipment.

1.6 RECORD SET OF DRAWINGS AND SPECIFICATIONS

A. Provide record set of Drawings and Specifications to Architect at completion of Contract.
   1. Refer to General Conditions for general requirements.
   2. Refer to Section 013300 - Submittal Procedures for posted (updated) job site contract documents.

B. During construction, maintain clean set of Drawings and Specifications for sole purpose of recording changes to Contract.

C. Mark record set methodically as work progresses, clearly and neatly, in color.

D. Include information cut and pasted into appropriate location of documents to reference change, adjustment, or clarification. Type of information to be recorded on record set includes but is not limited to:
   1. Addendum items sent during bidding
   2. Changes, deviations or revisions made, except minor or non-critical dimensions, including those made by Change Order or Supplementary Instructions.
   3. Accepted submittals including shop drawings, product data and samples.
   4. Omissions, including work omitted by accepted alternates.
   5. Dimensioned locations of major or main utility lines, such as main conduit runs, piping mains and similar work.
   6. Locations of control valves.
   7. Additions to the work.
   8. Changes in significant details.
   9. Changed footing or other elevations.
   10. Locations of electrical home run boxes, including circuit numbers and panel designations for each box.
   11. Coordination drawings.

12. Changes in locations of panelboards, outlets, drains, piping, openings, dampers and similar features.
13. Other similar data.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 019113
GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes commissioning process requirements for systems, assemblies, and equipment.

B. Contractor shall be familiar with all parts of Section 019113 and the Commissioning Plan issued by the Commissioning authority (CxA). Contractor shall execute all commissioning responsibilities assigned to them in the Contract documents.

C. Related Sections:
   1. Division 22 Plumbing.
   2. Division 23 Heating, Ventilating, and Air-Conditioning (HVAC).
   3. Division 26 Electrical.

1.2 DEFINITIONS

A. BoD: Basis of Design. A document that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

B. Commissioning (Cx): The process of ensuring that systems are designed, installed, functionally tested and performing in conformity with the Owner's Project Requirements and that the building operator has received complete equipment and systems documentation and training.

C. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning.

D. Commissioning Authority (CxA): The entity identified by the Project Manager to lead, monitor, coordinate and report on project commissioning activities. The commissioning provider may be the project A/E (most common), an independent third party or Owner.

E. Construction Checklists (CC): A quality control verification process performed by the installer as building assemblies, components, equipment and systems are being installed which documents that the materials, installation procedures, interfaces with other trades, start-up, testing and operation are correct, complete, in compliance with contract documents and manufacturer's recommendations and are ready for functional performance testing.

F. Functional Tests (FT): Contractor testing of installed building assemblies, components, equipment, systems and interfaces which confirms correct performance through all operating modes and compliance with contract documents and manufacturer's recommendations.

G. Owner's Project Requirements (OPR): A document that details the functional requirements of a project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.

H. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

1.3 COMMISSIONING TEAM

A. Members Appointed by Contractor(s): Individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to, representatives of each Subcontractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.

B. Members Appointed by Owner:
    a. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxA under a separate contract.
    b. Representatives of the facility, user and operation & maintenance personnel.
    c. Architect and engineering design professionals.

1.4 OWNER'S RESPONSIBILITIES

A. Provide the OPR documentation to the CxA and each subcontractor for information and use.

B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities and equipment training.

C. Provide the BoD documentation, prepared by Architect and approved by Owner, to the CxA for use in developing the commissioning plan and each Subcontractor.

1.5 ARCHITECT (A/E)

A. Attend the commissioning scoping meeting and other selected commissioning team meetings.

B. Perform normal submittal review, construction observation, as-built drawing preparation, etc., as contracted.

C. Provide design narrative documentation requested by the CxA.

D. Coordinate resolution of system deficiencies identified during commissioning, according to the contract documents.

E. Prepare or facilitate and submit final as-built design intent documentation for inclusion in the O&M manuals. Review and approve the O&M manuals.

F. Furnish a copy of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CxA.

G. Attend: Within 10 months of substantial completion and prior to completion of warranty period, CxA shall coordinate and facilitate a substantial completion review meeting. The intent of the meeting will be to review the project design, construction, turnover, operation and warranty issues. Contractor is required to have key project personnel in attendance and participating in the review for the purpose of making future project delivery improvements.

1.6 SUBCONTRACTOR'S RESPONSIBILITIES

A. Subcontractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:
    1. Attend commissioning team meetings held on a monthly basis.
    2. Integrate and coordinate commissioning process activities with construction schedule.
    3. Review and accept construction checklists provided by the CxA.
    4. Complete paper construction checklists as work is completed.
    5. Review and accept commissioning process test procedures provided by the Commissioning Authority.
    6. Complete commissioning process test procedures, involve manufacturer where required to demonstrate.
    7. Evaluate deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
    8. Cooperate with the CxA for resolution of issues recorded in the Action Log.
    9. Provide requested documents to the CxA for project documentation.
    10. Coordinate the training of owner personnel.
    11. Ensure that Subs execute seasonal or deferred functional testing, witnessed by the CxA.
    12. Attend: Within 10 months of substantial completion and prior to completion of warranty period, a substantial completion review meeting.

1.7 CXA'S RESPONSIBILITIES

A. Organize and lead the commissioning team.

B. Provide commissioning plan.

C. Convene commissioning team meetings.

D. Provide Project-specific construction checklists and commissioning functional test procedures to subcontractors.

E. Verify the execution of commissioning process activities using random sampling. Verification will include, but is not limited to, equipment submittals, construction checklists, functional tests, and test reports to verify compliance with the OPR. When a random sample does not meet the requirement, the CxA will report the failure in the Action Log.

F. Prepare and maintain the Action Log.

G. Observe and approve the training of the Owner's operating personnel.

H. Prepare and maintain completed construction checklist log.

I. Coordinate: Within 10 months of substantial completion and prior to completion of warranty period, a substantial completion review meeting.

J. Compile test data, inspection reports, and certificates; include them in the commissioning process report.

K. Upload the final commissioning report to USGBC for LEED Certification, complying with LEED Cx prerequisite (Fundamental Commissioning) and Enhanced Commissioning credit.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Provide equipment required to perform startup, checkout and testing. Equipment shall be calibrated within the past year and in accordance with the manufacturer's recommendations.

PART 3 EXECUTION

3.1 MEETINGS

A. Each contractor is required to attend meetings related to commissioning (pre-construction, construction progress, etc.) and have personnel requested by CxA in attendance to facilitate quality control and coordinate commissioning efforts.

B. The CxA will present an overview of the project's commissioning process at the initial commissioning team meeting. The commissioning team members will be identified and their responsibilities reviewed.

C. At subsequent meetings, contractors are to provide a review of project progress, a report on the status of issues, commissioning tasks and scheduling for future commissioning tasks.

3.2 SCHEDULING

A. Reference General Requirements in Division 01 for Lead Contractor responsibilities for scheduling. Each contractor shall provide the Lead Contractor a detailed schedule and regular updates of commissioning tasks for incorporation into the project schedule.

3.3 ACTION LOG

A. Each contractor is responsible for completing action items in a timely manner that are noted in the Action Log as their responsibility. Timely response and successful completion are a requirement to avoid withholding of payment.

3.4 CXA SITE VISITS

A. Commissioning is a team effort requiring the cooperation of all parties. Contractors are to proactively carry out their commissioning responsibilities and are to assist the CxA during site visits in performing commissioning tasks. This includes providing access to and demonstrating the installation, operation, and testing of commissioned systems; responding to CxA requests for information; carrying out proactive and corrective actions; and accurate reporting on system status and conditions.

3.5 CONSTRUCTION CHECKLISTS

A. The construction checklists are a formalized means to provide individual workers the criteria for a successful installation, adherence to the construction documents and to easily track construction progress.

B. Each assembly, component, equipment, system and interface to be commissioned shall be verified by the installer at the site while work is underway and documented on the construction verification checklists. The contractor is responsible for successfully completing installations, documenting this on the construction checklist forms and correcting all deficiencies.

C. Contractor shall periodically review the construction verification schedule with the CxA allowing advance notice of activities of 5 business days so that the CxA may witness as deemed necessary. If CxA identifies more than a 10% discrepancy rate during confirmation of construction verification, the contractor shall correct all deficiencies and revalidate all items covered by that checklist and resubmit new checklists. The cost of reconfirmation of construction verification due to equipment or construction deficiencies is the responsibility of the contractor and subject to deductive change order at Owner's discretion. Correction of deficiencies and revalidation are the responsibility of the contractor and are not subject to time extensions or delay claims.

D. Complete the construction checklists for this project and submit to the CxA for review and comment. The construction checklist must be sent to the CxA a minimum of one week prior to final scheduling of functional tests. Contractor should make multiple copies of the blank test forms as needed for duplicate items.

3.6 FUNCTIONAL TESTING

A. Complete the functional performance test procedures included on the functional performance test forms on this project. Coordinate with Owner, A/E and CxA so they may witness and document test results.

B. Contractors are responsible for completion and coordination of their work with all trades prior to testing, preplanning testing procedures, performing equipment start-up, insuring necessary staff and resources are on hand and expediting testing. This includes completion of testing and balancing by the HVAC contractor required for successful functional performance testing. Failure to complete or coordinate work, preplan or have staff and resources available to carry out testing will result in retesting. Submit completed construction checklist forms and testing adjusting and balancing (TAB) report to CxA for review prior to scheduling testing for witnessing.

C. Contractor shall coordinate functional performance testing with OWNER, the A/E and CxA and notify them 5 business days prior to testing so that they may witness and document the test results. All contractors involved with specific assemblies, components, equipment, systems and interfaces shall have qualified installers and technicians present at the same time working together to perform testing and demonstrate correct performance through all operating and failure modes and compliance with contract documents and manufacturer's recommendations.

D. CxA shall establish sampling protocol and at the time of testing select sample test locations for identical pieces of equipment. Where simulation of conditions or altering of setpoints or values is required to achieve an operating or failure mode for testing, the contractor must receive CxA approval.

E. With Owner's oversight, the CxA is responsible for witnessing functional performance testing and recording the results and deficiencies. Correct minor deficiencies during testing. Deficiencies that cannot be corrected during testing will be documented and subject to retest. Retesting will continue until no deficiencies remain.

F. Retesting is required when testing cannot be successfully completed. Deficiencies requiring retesting include:

1. Incomplete work and/or coordination with others
2. Inadequate preparation of systems for testing
3. Inadequate preplanning
4. Inadequate staff, equipment, tools or resources for testing
5. Material, equipment or construction deficiencies
6. Incomplete or failed test due to reasons under the Contractor's responsibility

G. The cost of retesting is the responsibility of the contractor and subject to deductive change order at Owner's discretion. Correction of deficiencies and retesting are the responsibility of the contractor and are not subject to time extensions or delay claims.

END OF SECTION

SECTION 024100
DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Disconnection of utility services to building.
2. Demolition of buildings and surface features indicated.
3. Removal of demolition material from site.

1.2 CONDITION AND ACCEPTANCE OF PREMISES

A. Accept premises as existing. Accept buildings to be demolished upon execution of Contract with Owner. No damage or loss shall relieve Contractor from obligation to complete work under this Contract.

B. Where the work of removals, demolition, cutting and similar work involves possible hazardous substances or harmful physical agents, such as asbestos fibers, exercise extreme care to avoid damage and preserve safety of personnel. Notify Owner before making removals or cutting such material so that tests of such substances may be taken in order to ascertain whether asbestos fibers exist. Accomplish removal or cutting work involving such material by competent and qualified personnel as contracted and approved by Owner, including barriers to isolate area. Owner will pay for hazardous material removal and disposal, unless the hazardous substance or harmful physical agents have been generated or caused to be on Project by Contractor.

1.3 PROTECTION AND SAFETY

A. Execute work in a manner to prevent injury or damage to public or private property. Prevent damage from falling debris or other cause. Do not interfere with use of adjacent buildings or free, safe passage to and from same.

B. Furnish temporary sidewalks, barricades, covers and other temporary structures necessary for proper and safe conduct of work, or as required by law. Remove without additional compensation.

C. Protect trees, whenever possible, from damage. Repair injuries to bark, trunk and branches of trees by dressing, cutting and painting by skilled specialist. When so directed by Architect/Engineer (A/E), remove trees which have been injured; additional compensation will be provided by Change Order to Contract.

D. Do not drop material from great height, but lower by appropriate demolition equipment or by enclosed duct chutes. Where multi-story buildings are being demolished, enclosed chutes shall include control gates to govern flow of materials into receiving trucks. Sprinkle during demolition operations to allay dust.

E. Take precautions to prevent movement or settlement of adjacent structures, streets, walks, and similar work; provide and place adequate bracing, shoring or supports. Be responsible for complete safety of nearby buildings and assume liability for damage, movement, settlement or similar injury resulting from operations or work under contract. If safety of nearby buildings or other work appears endangered, stop work and take corrective or preventative measures to eliminate possibilities of damage, injury, settlement or movement. Conform to instructions from Municipality regarding safety, additional precautions, additional bracing or shoring and similar protective measures. Support provisions shall be adequate and be carried to lower levels or grade as required to insure complete safety and prevent settlement.

F. Provide warning lights and other lighting as required to permit safe pedestrian traffic.

G. Exercise prudent operation with heavy equipment to prevent damage when working adjacent to existing buildings. Govern operations accordingly.

H. Permanently seal abandoned water wells located within the parcels being demolished. Sealing shall be as specified in Section MHD 218 of "The Water Construction Code and Amendments to

Regulations Relating to the Licensing of Water Well Contractors" as adopted by the Minnesota State Board of Health, April 11, 1984.

I. Use planking or other approved methods to protect sidewalks adjacent to property from damage due to demolition operations, including trucks and equipment. Repair damage to walks with equal or better materials by licensed concrete contractor.

1.4 PERMITS AND REGULATIONS

A. Review and comply with national, state and local standards and regulations including, but not limited to, pollution control standards.

B. Apply and pay for permits necessary to perform work.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Use appropriate equipment to obtain results expected, considering safety and expeditious methods and operations.

B. Use of explosives is not permitted.

PART 3 EXECUTION

3.1 RODENT AND PEST EXTERMINATION

A. Rodent and pest extermination to premises and existing structure or building shall be under the control of a Contractor or subcontractor licensed by the State or Municipal Health Department or Environmental Agency having jurisdiction.

B. Proper and safe use of rodenticide shall be in accordance with manufacturer's latest printed directions and with State or Municipal laws, ordinances and regulations. During and after rodent and pest control has begun, safeguard building from unlawful entrance until certificate from the State or Municipality Health Department has certified that rodents and pest nuisances have been exterminated within structures and premises.

C. Properly dispose of dead rodents, pest nuisance, bait, poison and similar items before demolition or wrecking operations begin.

3.2 EXISTING UTILITIES AND UNDERGROUND FEATURES

A. Contact municipal authorities and utility companies with jurisdiction in the area. Have utility companies verify and locate utility lines within the construction limits prior to initiating work.

B. Seal off openings which extend beyond building or property lines with 12-inch concrete block and mortar. Seal vertical shafts, tunnel openings and cave openings within property in same manner.

C. Plug building sewers and cap other utility lines. Contact utility companies for approved methods of plugging and capping utility lines.

D. Do not start demolition until services have been cut off, sealed, capped, removed or otherwise made inoperative by Contractor or applicable Utility Company representative. Protect seals, caps, stubs or similar services to remain.

3.3 DEMOLITION

A. Remove exterior walls and foundation walls to a level of 4 feet below grade of adjoining ground. At areas of proposed buildings or paved surfaces, remove walls and floors completely. Do not disturb or undermine adjacent private property or street right-of-way. Remove common walls supporting public sidewalks or private improvements down to sidewalk or private property grade. Do not permit wall or part thereof to fall outwardly onto public sidewalks or streets.

1. Demolish, fill with sand and seal vaults, areas, coal-holes, tunnels, trap doors or other openings located in public right-of-way adjacent to and having served the buildings being demolished. Owners of public or private utility systems still in use in vaults, areaways, coal-holes, tunnels,

trapdoors or other openings will be responsible for moving or protecting same. This does not include utility vaults currently maintained by utility companies in the adjacent right-of-way area.

B. Remove on-grade slabs and those slabs up to 3 feet below grade. Treat slabs that are more than 3 feet below grade as basement slabs; they shall remain if not under new building or paved surfaces; however, break such slabs into distinct pieces which cover no more than 1 square yard apiece.

C. Remove other building walls, including interior foundation walls, partition walls, columns, piers, beams or other projections, to level of basement floor.

D. Remove supporting pads for storage tanks, fences, tanks and walls.

E. Perform other incidental and collateral work necessary to fully complete removal of building or buildings as specified.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

A. As it accumulates, remove from site debris, rubbish, and other materials resulting from demolition operations. Storage or sale of removed materials will not be permitted at site.

B. Dispose of demolished materials off site at a permitted disposal facility, at no cost to Owner.

END OF SECTION

SECTION 024119
SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Demolition and removal of selected portions of building or structure.
   2. Demolition and removal of site elements.
   3. Salvage of existing items to be reused or recycled.

1.2 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Use of elevator and stairs.
   5. Locations of proposed dust- and noise-control temporary partitions and means of egress.
   6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
   7. Means of protection for items to remain and items in path of waste removal from building.

B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

1.3 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. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Standards: Comply with ANSI A10.6 and NFPA 241.

1.4 PROJECT 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.
   1. Comply with requirements specified in Division 1 Section "Summary."

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.5 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

Not Used

PART 3 EXECUTION

3.1 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.

END OF SECTION

SECTION 061000
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Concealed wood blocking and nailers.
   2. Wood furring and grounds.
   3. Preservative treatment.
   4. Fire-retardant treatment.
   5. Anchors nails, bolts, and screws.

B. Related Sections:
   1. Section 064000 - Architectural Woodwork.
   2. Section 079000 – Joint Protection.
   3. Section 099600 – High Performance Coatings: Fire-Resistant Coatings.

1.2 DEFINITIONS

A. The following definitions apply to this section as they pertain to rough carpentry items.
   1. Rough Carpentry: Carpentry work not specified in other Sections and not used as exposed work.

1.3 DESCRIPTION

A. Concealed wood framing, blocking, sheathing, subflooring, underlayment, anchors, fasteners, adhesives, and related items, including accessories furnished and installed as specified herein.

1.4 SUBMITTALS

A. Product Data: Submit for carpentry in accordance with Section 013300, Submittals.
   1. Submit for sheathing, air infiltration barrier, vapor retarders, tapes, sealants, and miscellaneous products specified.

B. Certification:
   1. Submit letter certifying that lumber is kiln-dried to 15 - 19 percent moisture content, well seasoned, grade marked, trade marked and free from warp.
   2. Submit letter from treatment plant certifying that chemicals and process used and net amount of salts retained are in conformance with specified standards
   3. Submit letter certifying that fire-retardant treatment materials comply with requirements herein stated and local authorities having jurisdiction and that treatment will not bleed through finished surfaces.

1.5 QUALITY ASSURANCE

A. Lumber Standard:
   1. Comply with U.S. Dept. of Commerce Product Standard PS 20, including moisture content and actual sizes related to indicated nominal sizes.
   2. Comply with Standard Grading Rules No. 16 for West Coast Lumber.
   3. Comply with American Softwood Lumber Standard and with application grading rules of inspection agencies certified by American Lumber Standard Committee's (ALSC) Board of Review.
   4. Comply with lumber producer's inspection agency grading rules certified as conforming to "National Grading Rules for Dimension Lumber" established under Section 10 of PS 20 and local code standard.

B. Plywood Standard: Comply with U. S. Product Standard PS 1-74/ANSI A199.1; and Grades and Specifications, Performance-Rated Panels and Specifications by APA – The Engineered Wood Association local code standard. Each construction and industrial panel shall bear APA trademark and appropriate identification.

C. Lumber: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying agency, grade, species, moisture content at time of surfacing and mill.

1. Seasoning: Kiln-dry lumber to 15 - 19 percent moisture content, well-seasoned, grade marked, trade marked and free from warp.

1.6 DELIVERY, STORAGE AND HANDLING

A. Inspect wood materials for conformance to specified grades, species, and treatment at time of delivery to Project site.

1. Reject and return unsatisfactory wood materials.

B. Provide facilities for handling and storage of materials to prevent damage to edges, ends and surfaces.

C. Keep carpentry materials dry.

1. Store lumber and plywood in stacks with provision for air circulation within stacks.
2. Protect bottom of stacks against contact with damp surfaces. Protect exposed materials against weather.
3. Stack materials minimum 12 inches off ground, or if on concrete slab-on-grade, minimum 1-1/2 inches, fully protected from weather.
4. Provide for air circulation within and around stacks and under temporary coverings.

D. Place spacers between each bundle of pressure treated materials treated with waterborne chemicals to provide air circulation.

1.7 PROJECT CONDITIONS

A. Environmental Impact: Products containing following materials will not be permitted:

1. Urea Formaldehyde.
2. Chromium in wood pressure treatment products.
3. Arsenic.

1.8 COORDINATION

A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit, show location of furring, nailers, blocking, grounds and similar supports to allow attachment of other work.

1. Coordinate work directly with other subcontractors as necessary to insure proper fitting, joining or to clearances of other work. Obtain templates as required to insure proper fitting.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. FSC Certified Wood Products: Subject to compliance with specified requirements, acceptablemanufacturers and products are:

1. Certified Wood Products, Minnetonka and Maple Lake, MN www.certifiedwoodproducts.net
2. Aitkin Hardwoods, Aitkin, MN www.aitkinhardwoods.com
3. Other Minnesota providers: Upper Mississippi Certified Group (UMCG)
4. Other states: www.fscus.org/certified companies
5. Manufacturer of comparable products in compliance with Section 016210.

2.2 LUMBER

A. Dimension Lumber: Finished 4 sides, 15 percent maximum moisture content. Mark lumber "S-DRY".

1. Light Framing: Construction grade Douglas Fir or Southern Pine, appearance grades where exposed.
2. Boards: Construction grade.

B. Wood Blocking Miscellaneous Lumber: Lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members.
   1. Moisture content of 19 percent maximum for lumber items not specified to have wood preservative treatment.
   2. Grade: No. 3 or standard grade.

2.3 FIRE-RETARDANT TREATMENT

A. Fire Retardant Treatment: Pressure impregnation with fire-retardant chemicals.

B. Manufacturers:
   1. Dricon by Arch Wood Products,
   2. Pyro-Guard by Hoover Treated Wood Products,

C. Lumber and Plywood Treatment:
   1. Each piece to bear:
      a. UL FR-S rating (flame spread and smoke developed less than 25),
      b. Complying with extended 30-minute tunnel test, ASTM E84 or UL 723
      c. Meet interior Type A requirements in AWPA Standard C-20 for lumber and C-27 for plywood.
      d. And shall be registered for use as a wood preservative by the U.S. Environmental Protection Agency.
   2. Treatment to provide protection against:
      a. Termites,
      b. Fungal decay
   3. Treatment to be free of:
      a. Hologens
      b. Sulfates,
      c. Ammonium phosphate,
      d. Formaldehyde.

D. After treatment: Material shall be dried to an average moisture content of 15 percent or less for plywood and 19 percent or less for other lumber.

E. Complete fabrication prior to treatment to minimize cutting and jointing after treatment.
   1. Coat surfaces cut after treatment with heavy brush coat of same fire-retardant chemical.

F. Do not use twisted, warped, bowed or otherwise damaged or defective pieces.

G. Extent of Treatment: Wood materials as part of fire-rated assemblies shall be fire retardant treated.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install plumb, level, true and square to dimensions shown and required. Allow for finishes and proper clearances where necessary.

B. Provide sound bearing, square cuts, and full bearing surfaces. Set crown up for horizontal members. Shim and block where required.

C. Eliminate crooked, twisted, cupped or bowed framing where required.

D. Anchorage: Adequately anchor, fasten and support members to form secure, substantial and accurate anchorage and to hold required dimensions and prevent twist.

END OF SECTION

SECTION 064000
ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Custom-fabricated architectural woodwork
   2. Wood
   3. Laminate
   4. Solid surface
   5. Custom fabricated items
   6. Countertops
   7. Hardware and accessories, requirements for fabrication and Installation.

1.2 SUBMITTALS

A. Comply with Submittal Procedures in Section 013300.

B. Shop Drawings: Indicate dimensions, descriptions of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, including specific requirements where indicated.
   1. Show work in related and dimensional position with sections shown in not less than 1-1/2 inch scale and details at full size.
   2. Indicate materials and wood species, component profiles, fastening, jointing, details, finishes and accessories.
   3. Indicate locations of plumbing and electrical service field conditions.

C. Samples: Submit samples of factory finish on wood veneer and factory finish on solid wood in accordance with AWI Quality Standards Section 1500. Submit samples of finish on high pressure laminate for color and finish selection.
   1. Component Samples: Two sets of samples in 8 inch by 10 inch size, unless otherwise indicated, for each of the following items:
      a. High pressure laminate for color and texture/finish selection.
      b. Each wood veneer with shop applied finish.
         1) 5 inch by 24 inch.
      c. Worksurface for color and texture/finish (other than plastic laminate).
      d. Grommets for color.
      e. Thermoset decorative overlays.
      f. Hardware sample for appearance.
      g. Work surface for appearance review.
   2. Unit Samples: Units may be used as part of work if approved.
      a. Cabinetwork base (with door and drawer) without countertop.
      b. Cabinetwork wall unit with door.

D. Quality Assurance Submittals:
   1. Manufacturer/fabricator qualifications.

1.3 QUALITY ASSURANCE

A. Quality Standards: Comply with 2003 Quality Standards of Architectural Woodwork Industry.
   1. Lumber: Softwood - PS-20, hardwood - FSMM-L-736C, AWI Premium Grade, species as specified. Maximum moisture content of 10 percent.
   2. Plywood: Softwood - PS-1/ANSI A199.1, hardwood - AWI Premium Grade species as specified.

B. Fabricator's Qualifications: Not less than 5 years experience in the actual production of specified products.
   1. Previous performance by manufacturer has been satisfactory.

C. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurement before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
   1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurement before being enclosed and indicate measurements on shop drawings.

1.4 DELIVERY, HANDLING AND STORAGE

A. Deliver woodwork under cover.
   1. Do not permit delivery until project conditions, including humidity, are suitable.

B. Except as otherwise required by relationships detailed on Drawings, do not deliver interior woodwork until building is sufficiently dry to insure no damage to woodwork will result.
   1. Maintain minimum relative humidity less than 50 percent; in cold weather, provide heat for at least 10 days prior to delivery.

C. Protect woodwork items from damage, dust and dirt.

1.5 COORDINATION

A. Coordinate work directly with other subcontractors as necessary to insure proper fitting, joining or to clearances of other work.
   1. Obtain templates as required to insure proper fitting.
   2. If required, do not install or close up areas of cabinetwork until utilities have been installed.
   3. Verify electrical and mechanical characteristics with other subcontractors, and exchange shop drawings.

PART 2 PRODUCTS

2.1 WOODWORK MATERIALS AND QUALITY GRADES

A. Quality Standards: Materials and workmanship of woodwork shall comply with Custom Grade requirements of AWI Quality Standards, (except countertops shall comply with Premium Grade).

B. Interior Work for Transparent Factory Finish:
   1. Wood to match existing or as described on Drawings.

2.2 WOOD CABINETWORK

A. Grade: AWI Custom Grade for transparent finish pre-finishing except provide drawer fronts with vertical grain to sequence with vertical door grain unless otherwise allowed.

2.3 HARDWOOD VENEER PANELING

A. Interior Hardwood Veneers for Transparent Finish:
   1. Architectural Panel Grade, minimum 1/40 - inch veneers marked and classified for fire performance characteristics indicated by UL or other testing and inspection agency acceptable to authorities having jurisdiction.
   2. Species for Veneered Wood: Refer to Drawings.
      a. Provide from 12 feet continuous flitch.
   3. Matching of Veneers: Refer to Drawings.

B. Core for Hardwood Veneer Paneling: Duraflake FR (fire-rated) particle board by Duraflake Division of Williamette Industries, meeting Underwriter's Standard test for surface burning characteristics of building materials (UL 723).

C. Hardwood Mouldings and Trim: Solid stock, Custom Grade.
   1. Size, lengths, and dimensional profiles to coordinate with finished size requirements as detailed and shown on drawings.
   2. Match mouldings and trim for compatibility of grain and color to itself and with veneers.

D. Adhesives: Type as recommended by woodwork manufacturer and adhesive manufacturer for intended use.

2.4 PLASTIC LAMINATE

A. High Pressure Decorative Laminate Quality Grade (HPDL): Comply with Custom Grade requirements of AWI Quality Standards.
   1. Face Construction: Provide flush type cabinetwork, unless indicated otherwise.

B. Plastic Laminate: NEMA LD-3, GP-50 general purpose type for horizontal applications, GP-28 for vertical applications, and PF-42 post-forming type.
   1. Plastic Laminate Types and Colors:
      a. Refer to Drawings

C. Backing Sheet: LD-3, BK-50 backing grade, undecorated laminate, balancing sheet for where surface sheet is applied.

D. Cabinet Liner: Thermoset decorative overlay (melamine) or .020 inch cabinet liner, 45 lb. density particleboard. Color: Refer to Drawings.

E. Drawer Interiors: Melamine laminate, thermoset decorative overlay conforming to requirements of ALA, latest edition, color as selected on Drawings.

F. Cabinet Interior Shelves: Provide high pressure laminate at interior shelving in cabinetwork.

G. Adhesive: FS MMM-A-130A. Type as recommended by laminate manufacturer and adhesive manufacturer for intended use.

2.5 CORE

A. Coreboard: Particleboard ANSI A208.1, Grade 1-M-3.

B. Water Resistant Coreboard: Medium density fiberboard, ANSI A208.2-2009 155-F11-MR-50, ASTM D1037, Grade 155.
   1. Acceptable Manufacturer: Sierra Pine Composite Solutions; Medex.
   2. Provide water resistant coreboard for countertops with sinks or designated wet areas.
   3. Medium-Density Fiberboard: ANSI A208.2, Grade 155, made with binder containing no urea formaldehyde.

2.6 EDGES

A. Shelf, Door and Drawer Edge: 3mm PVC edge molding as selected to match.
   1. Wood Shelf Edge: Hardwood edge band with tongue and groove joint to shelf; miter at ends on shelves.
   2. Band all shelf edges.

2.7 ARCHITECTURAL CABINET TOPS

A. Quality Standard: Comply with AWI Custom grade. Grade:GP-50 (0.050 inch nominal thickness).

B. Plastic Laminate Top: High Pressure Decorative Plastic Laminate, clad, premium grade. Core material shall be particleboard as specified 1 inch thick, unless otherwise indicated. Provide balancing sheet on underside.
   1. Plastic Laminate Cladding: High pressure decorative plastic laminate complying with NEMA LD 3 and as specified herein.
      a. Colors, Patterns, and Finishes: As selected from laminate manufacturer's standard products, solid colors.
      b. Refer to details.
   2. Edge Treatment: 3 mm PVC edge molding, finish as selected to match counter.

2.8 CABINET HARDWARE

A. Hinges:
   1. Hinge Type 1: Fixed pin, steel hinges, dull chrome, 2-3/4 inch by 0.095 thick. BHMA A156.9, B01361.
   2. Hinge Type 2 Grass America, #3903, concealed, all metal hinges, 107-110 degree opening, self-closing, 3-way adjustable. Provide 3 per leaf over 48 inches high, 2 per leaf elsewhere. BHMA A 156.9 B01602.

B. Shelf Supports:
   1. Knape & Vogt #346 NP, pin size 1/4 inch diameter by 3/8 inch long.
      a. Provide at adjustable shelves in cabinetwork.

C. Drawer Slides: Cold rolled steel, zinc plated with positive stop and full extension. Rolling steel balls, nylon rollers by Accuride, Grass and Knape & Vogt meeting or exceeding requirements below:
   1. Minimum 150 lb. load rating.

D. Door and Drawer Pulls:
   1. Refer to Architectural drawings for type and product information.

E. Locks:
   1. Disc tumbler, master-keyed, dull chrome finish by CCL Security Products #0737 and #0738.
      a. Provide at hinged doors and drawers, where indicated.
   2. Other Acceptable Manufacturers: CompX National, Häfele.

F. Accessories:
   1. Ceiling type hook, magnetic catches, and other required hardware, as recommended by fabricator for intended use.

2.9 ADJUSTABLE SHELF STANDARDS AND BRACKETS

A. Manufacturers: Knape & Vogt, Capitol, or Garcy.

B. Typical Standards: K&V No. 85 with No. 185 brackets, Anachrome finish.

C. Janitor Shelf Standards and Brackets:
   1. Knape & Vogt #161 heavy duty 14 inch bracket and K&V #83 standards. Provide for 3 shelves, with 9 brackets.

D. Space standards not over 32 inches on center. Where length of standards cannot be determined from drawings, assume shelves are spaced 12 inches on center vertically, and add 12 inches to shelf spacing and furnish next larger stock size.

2.10 SOLID SURFACING

A. Solid Surface Counters: Where indicated, provide top with coved backsplash.
   1. Cast polymer 1/2-inch sheet.

B. Pattern and Color: as shown on Drawings

C. Joint Adhesive: As recommended by manufacturer.

2.11 SHELVES, RODS AND SUPPORTS

A. Metal Rod and Shelves: Wall-mounted plastic laminate shelf with exposed metal support bracket.
   1. Brackets: Heavy-duty brackets as selected by Architect.
   2. Shelves: Plastic laminate as selected on Drawings.

2.12 ACCESSORIES

A. Grommets:
   1. Grommet Type 1: Electric Power Cord and Telephone Cable Access Grommets: ABS Plastic grommets 1- 7/8 inches inside diameter, 2-3/8 inches overall diameter, with cap where indicated on Drawings.
      a. Color as selected by Architect.
   2. Grommet Type 2: Computer Cable Grommets: ABS plastic grommets rectangular, 4 inches by 2 inches overall, with cap where indicated on drawings for countertops.
      a. Color as selected by Architect.
   3. Manufacturers: Doug Mockett & Company, Box 3333, Manhattan Beach, CA., TG Series.

2.13 WOODWORK FABRICATION - GENERAL

A. Intent: It is intent of Drawings and Specifications to provide durable, serviceable millwork meeting highest standards and materials.
   1. Methods, construction and assembly shall meet these standards.

B. Fabricate woodwork in accordance with reviewed shop drawings.

C. Provide cutouts and holes for items such as sinks, fittings, risers, ducts, and other features furnished into work of this section.
   1. Where it may not be practical to precut holes and where coordination with field features may be uncertain or difficult, holes and openings shall be field cut and sealed.
      a. Sinks by Mechanical, Division 22.

D. Woodwork Assembly: Assemble work in mill as much as possible. If necessary to insure best results, complete units shall be assembled in mill and then partially disassembled into workable sections for shipping and project installation.

E. Shop fabricate wall-mounted shelving out of plywood when spanning over 30 inches.

F. Hardwood Veneer Paneling: Wood veneer faces will be selected to provide blueprint fabrication of panels.
   1. Doors that appear within areas of paneling will be made as part of sequence. If more than one flitch is used, similar flitches will be selected and break shall be made at inconspicuous point such as corner, door or window.
      a. Joints shall be tightly spliced to avoid visible open joints. Open joints will be rejected.

2.14 PREFINISHING

A. Finish in accordance with AWI Quality Standards Section 1500.
   1. Finish Grade: Premium Grade: Stain, filler, sealer and 2 top coats.
      a. AWI System Catalyzed Polyurethane
      b. AWI System Conversion Varnish
   2. Apply finish to achieve minimum 4 mil total dry film thickness.

B. Factory finish as selected by Architect.

2.15 CABINETWORK FABRICATION

A. Shop assemble cabinetwork for delivery to site in units easily handled to permit passage through building openings.
   1. Fabricate cabinetwork in accordance with reviewed shop drawings and AWI Custom Grade Standards.

2.16 PLASTIC LAMINATE FABRICATION

A. Quality Grade: Workmanship of high pressure laminate shall conform to Custom Grade requirements of AWI Quality Standard.

B. Fabrication: Apply laminate finish in full-uninterrupted sheets consistent with manufactured sizes.

2.17 FABRICATION OF CABINETWORK DOORS

A. Fittings and Sizes: Trim square and factory-size to nominal opening size less approximately 1/16 inch in width and 1/8 inch in height (unless otherwise required) for final fitting.

B. Quality Grade: Except as otherwise specified herein, provide Custom Grade as defined in AWI Quality Standards.

C. Guarantee: Cabinetwork doors shall be guaranteed for 3 years. Guaranty shall cover faulty workmanship, materials, delamination or splitting of veneers, or warp in excess of 1/4 inch. Replace doors complete including fitting, hanging, and finishing.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation of Woodwork shall be in accordance with AWI Quality Standards Section 1700 - Installation of Architectural Woodwork.

B. Install free from hammer or tool marks, open joints or slivers or other defects detrimental to appearance or performance.

C. Set plumb, level, square and true.
   1. Scribe to floors and walls as required.
      a. Miter corners, countersink nails, drill holes for nails in hardwood.
      b. Install work after building humidity is at acceptable level.

D. Ensure that mechanical and electrical items affecting this section are properly placed, complete, and have been inspected by Architect prior to commencement of installation.

E. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned.
   1. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
      a. Complete installation of hardware and accessory items as indicated.
      b. Maintain veneer sequence matching of cabinets with prefinish.
   2. Install screw caps where required.

F. Tops: Anchor securely to base units and other support systems as indicated.

G. Prefinished Paneling: Anchor paneling to supporting substrate with concealed panel-hanger clips and by blind nailing on backup strips, splined-connection strips, and similar associated trim and framing.
   1. Do not face nail unless otherwise indicated.

H. Installation of wood paneling shall be in accordance with AWI Quality Standards Section 1700 - Installation of Architectural Woodwork.
   1. Prepare doors to receive hardware. Refer to Section 081400 - Wood Doors - for coordination, and Section 087100 - Hardware for hardware requirements.

I. Install prefinished boards with butt joints, and use finishing nails for exposed work. Finished work shall be free of hammer marks or open joints.

J. Install solid surfacing in accordance with reviewed shop drawings and manufacturer's instructions.

K. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.

L. Clean cabinetwork, counters, shelves, hardware, fittings and fixtures.

END OF SECTION

SECTION 081113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pressed steel hollow metal doors and frames.
2. Fire-rated hollow metal doors and frames.
3. Hollow metal window-walls, glazed openings, and other hollow metal frames for glass.
4. Rough bucks, frame reinforcing, door reinforcing, door insulation, closure panels, clip angles and anchorage.
5. Factory prime paint finish.

B. Related Sections:

1. Section 087100 – Door Hardware: Finish hardware, weather-stripping and sound-stripping.
2. Section 088000 - Glazing: Glass and glazing.
3. Section 099000 – Painting: Finish painting.

1.2 REFERENCES

A. A250.8-2003 - Recommended Specifications - Standard Steel Doors and Frames, Steel Door Institute, unless herein specified.

B. Underwriters' Laboratories Inc. (UL) UL63, Factory Mutual (FM), or Warnock Hersey as applicable to fire rated hollow metal assemblies and acceptable to authorities having jurisdiction.

C. NFPA No. 80 - Fire Doors and Windows.

D. ANSI/BHMA A115 - Specification for Door and Frame Preparation for Hardware.

E. ANSI/BHMA A156.7-2009 - Template Hinge Dimensions.

1.3 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 013300. Indicate general construction, configurations, jointing methods, reinforcements, and location of hardware and cutouts for glass and louvers.

1.4 QUALITY ASSURANCE

A. Applicable Standards: Specifications and standards of SDF 100-83.

B. Installer Qualification: Experience with installation of similar materials.

C. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Windows", and have been tested, listed, and labeled in accordance with ASTM E152-81AE02 " Methods of Fire Tests of Door Assemblies" by nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.

1. Oversize Fire-Rated Door Assemblies: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, provide certificate or label from approved independent testing and inspection agency, indicating that door and frame assembly conforms to requirements of design, materials and construction as established by individual listings for tested assemblies.
2. Temperature Rise Rating: At stairwell enclosures, provide doors which have Temperature Rise Rating of 450 degrees F maximum in 30 minutes of fire exposure.

1.5 PRODUCT HANDLING

A. Deliver hollow metal doors in manufacturer's protective covering. Handle hollow metal with care to prevent damage.

B. Door Storage: Store doors in upright position, under cover. Place doors on at least 4 inch wood sills or on floors in manner that will prevent rust and damage. Do not use non-vented plastic or canvas shelters which create humidity chamber and promote rusting. If corrugated wrapper on door becomes wet, or moisture appears, remove wrapping immediately. Provide 1/4 inch space between doors to promote air circulation.

C. Frame Storage: Store frames under cover on 4 inch wood sills on floors in manner that will prevent rust and damage. Do not use non-vented plastic or canvas shelters which create humidity chamber and promote rusting. Store assembled frames in vertical position, 5 units maximum in stack. Provide 1/4 inch space between frames to promote air circulation.

PART 2 PRODUCTS

2.1 HOLLOW METAL

A. Acceptable Manufacturers: Trussbilt, Mesker, Pioneer, Steelcraft, Curries, Ceco, North Central Supply, Precision Metals, Republic, Kewanee, Security Metal Products.

B. Cold Rolled Steel Sheets: Cold formed, prime quality pickled, annealed stretcher level steel, free from scale, pitting or other surface defects, complying with ASTM A366.

C. Galvanized Steel Sheets: ASTM A526 or A527, G60 zinc coating. Use galvanized steel sheets for exterior hollow metal doors, door frames and door louvers.

D. Minimum gages of hollow metal are specified below. Provide heavier gage if required by details or specific condition. Entire frame and sidelight shall be of same gage.

1. 16 gage: Interior door frames, and glazed opening frames.
2. 16 gage: Labeled frames (or heavier if required by label).
3. 18 gage: Interior doors (or heavier if required by label).
4. 20 gage: Trim members.

2.2 RELATED MATERIALS

A. Steel Reinforcing: ASTM A36.

B. Door Bumpers or Silencers: GJ-64.

2.3 HOLLOW METAL FRAMES

A. General: Provide frames as full profile welded unless otherwise indicated. Where necessary, alternate details will be considered provided design intent is maintained. Consider and provide for erection methods.

B. Typical Reinforcing: Provide minimum hinge reinforcement 3/16 inch by 1-1/2 inch by 9 inch and lock strike reinforcement 3/16 inch by 1-1/2 inch by 4 inch long. Provide similar reinforcement for hardware items as required to adequately withstand stresses, minimum 12 gage, including channel reinforcement for door closers and closer arms, door holders and similar items. Provide reinforcement and clearances for concealed in-head bar closers and for mortise locks.

C. Cover Plates: For hinge and strike plate cutouts, provide fully enclosed pressed steel cover boxes spot welded to frames behind mortises.

D. Hardware: Mortise, reinforce, drill and tap for mortise hardware, except drilling and tapping for surface door closers, door closer brackets and adjusters shall be done in field.

E. Anchorage: Provide standard and special anchorage items as required. Provide 12 gage angle clips at bottom of frames with punched holes for securing frames to floor, except where frames are secured entirely by rough bucks. Provide formed steel channel spreader at bottom of frames, removable without damaging frame. At masonry, provide anchors (about 2 inch by 10 inch) approximately 24 inches on center.

F. Silencers: Provide specified silencers, except where stop does not occur and at smoke gasketed openings, 3 per jamb at single door and one for each door at double doors.

G. Extensions: Reinforce transom bars or mullions as necessary to provide rigid installation. Where required (as at multiple openings) to stabilize large frames, provide frame or mullion extensions to anchor to structure above, proper size to fit within overhead construction. Provide angle clips to fasten to structure.

H. Mullions: Provide mullions, continuously reinforced, straight and without twist, of tubular design. For removable mullions provide fastenings of non-ferrous bolts at bottom, with sleeves at head of frame for mullion to clip over.

I. Clearances: Provide and be responsible for proper clearances at metal frames, including for weatherstripping, soundstripping and smoke gasketing. Glass clearance shall be thickness of glass plus clearance each side (1/8 inch minimum exterior - 1/16 inch minimum interior), adjust for installation, glass thickness to allow for glazing and sealant. Where sealed double glazing is indicated, provide rebates minimum of 3/4 inch and provide 1/4 inch clearance at glass edges. Where units fit around concrete blocks (blocks built into frames) obtain actual dimensions of blocks being used to establish minimum clearances.

J. Terminated Stops: Terminate stops 6 inches above finish floor with a 90-degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.

K. Stops: Set with countersunk or Jackson head screws.

L. Labeled Frames: Construct in accordance with requirements for labeled work. Attach proper U.L. label, Warnok Hersey. "B" labeled frames shall be 1-1/2 hour construction.

M. Joinings: At frames with equal width jambs and head, neatly miter on face (except locations as at transom bars and at frames with large head members). Cope and butt stops. Weld length of entire joint, including face and flat intersections. Grind smooth, at other frames, provide same mitered joint wherever possible (at intersection of jamb-head or jamb-sill) and at other locations butt metal neatly and fully welded. All joints to be tight, neatly ground, puttied, and sanded smooth before priming.

N. Workmanship: Fabricate so no grind marks, hollow or other out-of-plane areas are visible. At joints of intermediate members (as mullions and transom bars), provide tight joining, neatly accomplished without holes, burned out spots, weld build up or other defacing work. Fill to close cracks and to preserve shapes. Tightly fit loose stops, to hairline joints.

O. Finish: Clean frames by degreasing process and apply thorough coating of baked-on primer, covering inside as well as outside surfaces. At galvanized frames, coat welds and other disrupted surface with zinc-rich paint containing not less than 90 percent zinc dust by weight.

2.4 FRAME ANCHORS

A. 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 (50 mm) wide by 10 inches (250 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. 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, not less than 0.042 inch (1.0 mm) thick, and as follows:
   1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
   2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (50-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.5 HOLLOW METAL DOORS

A. Provide to design indicated including: Flush panel doors, flush panel with cut-out as indicated, stile and rail type, stile and rail with door louver. Use galvanized steel at exterior doors.

B. Flush Doors: Reinforce, stiffen and sound deaden. Provide cut-outs for glass and louvers with stops as shown. Provide flush steel closure at top of exterior and interior doors and at bottom of exterior doors with drain holes in bottom closure. Provide seamless edge. Following door construction types are acceptable.
   1. Exterior Doors (and Interior Reinforced Doors): Reinforced with 20 gage steel stiffeners vertically 6 inches o.c. full height and width, spot welded 5 inches o.c. to both face sheets. Stiffeners welded together top and bottom. Insulate with 2-1/2 lb density mineral wool insulation.
   2. Honeycomb Core Interior Doors (Typical): Impregnated Kraft honeycomb core completely filling inside of center panel and permanently laminated to inside face sheets.
   3. Door Construction: Manufacturer's standard honeycomb, polyurethane foamed in place, unitized steel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate in accordance with SDI standards.

C. Stile and Rail Doors: Construct with equivalent reinforcing. Reinforce intersections of stiles and rails at stile type doors, to form rigid unit capable of withstanding severe abuse without racking or sagging.

D. Labeled Doors: Insulate as required by Underwriters Laboratories. Build in special hardware and provide astragals as indicated. At one hour and at 1-1/2 hour doors at enclosures, maximum transmitted temperature end point shall not exceed 450 degrees F above ambient at end of 30 minutes of fire exposure specified in NFPA 252 and UL10 ABC as applicable.

E. Seamless Vertical Edges: Construct doors with smooth flush surfaces, without visible joints or seams on exposed faces or stile edges.

F. Typical Reinforcement: Provide as required for hardware items. For lock reinforcement, provide manufacturer's standard reinforcement. Provide 12 gage reinforcement for escutcheons or roses. centering clips to hold lock case in alignment. For door checks, provide 3/16 inch channel type reinforcements, 3-1/2 inch deep by 14 inches long, or as required. Hinge reinforcement minimum 7 gage by 1-1/2 inch by 9 inch bar. Weld reinforcing to door. Reinforce doors for surface items such as surface and semi-concealed closers, brackets, surface holders and door stops. Drilling and tapping installation of these surface items shall be done in field by hardware installer.

G. Special Reinforcing: At exterior doors, reinforce inside of door on hinge side with high frequency hinge preparation. Weld to door.

H. Hardware: Mortise, reinforce, drill and tap for hardware furnished under Section 087100 – Door Hardware, except drilling and tapping for surface door closers, door closer brackets and adjusters shall be done in field. Obtain templates from hardware supplier.

I. Finish: Provide prime coat finish on doors. Thoroughly clean off rust, grease and other impurities. Grind welds smooth, no marks shall show. Apply metallic filler as required to fill cracks and joints and to level any weld areas or similar imperfections. Sand filler coat smooth.

2.6 HOLLOW METAL PANELS

A. Same materials and constructed and finished in same way as specified for hollow metal doors.

2.7 FASTENINGS

A. Provide fastenings, anchors and clips as required to secure hollow metal work in place. Provide Jackson head screws, or flatter. Dimple metal work to receive screw heads. Set stops and other non-structural fastenings with #6 Jackson head self-tapping screws.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine supporting structure and conditions under which hollow metal is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install hollow metal in accordance with reviewed shop drawings and manufacturer's printed instructions. Securely fasten and anchor work in place without twists, warps, bulges or other unsatisfactory or defacing workmanship. Set hollow metal plumb, level, square to proper elevations, true to line and eye. Set clips and other anchors with Ramset "shot" anchors or drill in anchors as approved. Units and trim shall be fastened tightly together, with neat, uniform and tight joints.

B. Placing Frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

1. In masonry construction, building-in of anchors is specified in Section 042000 - Unit Masonry. At in-place concrete or masonry construction, set frames and secure in place with masonry anchorage devices with bolt heads neatly filled with metallic putty, ground smooth and primed.
2. At acoustic rated metal stud and gypsum board partitions, install insulation within frames.
3. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
4. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
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.

C. Place fire-rated frames in accordance with NFPA Standard #80.

D. Door Installation: Fit hollow metal doors accurately in their respective frames, within following clearances: Jambs and head 3/32 inch, meeting edges pair of doors 1/8 inch, sill where no threshold or carpet 1/4 inch above finished floor, sill at threshold 3/4 inch maximum above finished floor, sill at carpet 1/4 inch above carpet. Place fire-rated doors with clearances as specified in NFPA Standard #80.

3.3 ADJUSTING AND CLEANING

A. Prime Coat Touch-Up: Immediately after installation, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION

SECTION 081116
ALUMINUM DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Aluminum doors and frames, (exterior or interior - complete with sidelights and transom lights.

B. Related Sections:

1. Section 087000 - Hardware.
2. Section 079000 - Joint Sealers: Perimeter sealants and back-up materials.
3. Section 088000 - Glazing.

1.2 SUBMITTALS

A. Shop Drawings and Product Data: Submit by door manufacturer in accordance with Section 013300. Indicate pertinent dimensioning, general construction, component connections and locations, anchorage methods and locations, hardware locations and installation details.

B. Samples: Submit samples of aluminum finish to Architect for appearance acceptance and color selection.

1.3 DESCRIPTION

A. One-piece low rise non-thermally and thermally improved framing systems designed to accept 1/4 inch or 1 inch glazing material.

1. Profiles: 2 inch wide by 4-1/2 inch.
2. Thermally improved: Internally reinforced to resist windloading.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Installation of aluminum entrances shall be by manufacturer's approved installer.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver material in manufacturer's packaging complete with installation instructions. Handle with care to prevent damage.

1.6 WARRANTY

A. Warranty aluminum doors and frames for period of 10 years from Substantial Completion. Warranties shall be written by manufacturer; warranties by installer or distributor will not be accepted.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Frames: Tubecraft T-1400 Thermal or EnCore Series by Kawneer Company

B. Doors: Tubecraft Heavy Duty, 40 HD Series Medium Stile (50 HD Series Wide Stile) or Tubecraft Monumental 30 M Series Medium Stile (60M Series Wide Stile) or Kawneer Medium Style by Kawneer Company

C. Other Acceptable Manufacturers: VistaWall Architectural Products, Tubelite Incorporated, EFCO Incorporated.

2.2 MATERIALS AND COMPONENTS

A. Frames (interior): Extruded aluminum alloy; ASTM B221; complete with integral weather-stripping, extruded aluminum security type snap-in glass stops for sidelights and transom lights, of profile to suit frame section.

B. Doors: Extruded aluminum alloy; ASTM B221; with snap-in type glass stops and vinyl (neoprene) glazing splines.

C. Accessories: Closures, internal reinforcement and anchorage as indicated and recommended by entrance manufacturer. Provide concealed reinforcement for hardware. Provide 1-1/4 inch by 1/4 inch continuous steel bar reinforcement at hinge stile and 1-1/4 inch by 1-1/4 inch by 3/16 inch continuous steel angle at hinge jamb with zinc-chromate coating. Provide steel plate reinforcement for closer attachment. Provide 3/8 inch tie rod at top and bottom of doors with spot welds at each corner.

D. Finish, Anodized Aluminum:
   1. Class I Clear Anodized Finish: AA-M12C22A41 (mechanical finish, non- specular as fabricated; chemical etch, medium matte; 0.7 mil thick clear anodic coating).
   2. Class I Color Anodized Finish: AA-M12C22A42/A44 (non-specular as fabricated mechanical finish; chemical etch, medium matte; 0.7 mil thick integrally or electrolytically deposited colored anodic coating).
      a. Color: As shown on Drawings or to match existing.

E. Finish: Exposed surfaces with Kynar 500 fluorocarbon coating complying with AAMA 2605, minimum 70 percent Kynar 500, custom color as selected with Kynar 500 clear top coat.)

2.3 FABRICATION

A. Fabricate aluminum doors and frames at manufacturers facility in accordance with reviewed shop drawings and to allow for clearances and shim spacing around perimeter of assemblies to enable installation. Provide for thermal movement. Fabricate door stiles and door frames of seamless hollow tubes 0.125 inch thickness.

B. Provide anchorage devices to securely and rigidly fit door and frame assemblies in place.

C. Accurately and rigidly fit together joints and corners. Match components ensuring continuity of line and design. Ensure joints and connections are flush, hair line and weatherproof.

D. Provide for moisture entering joints and condensation occurring within frame construction to drain to exterior.

E. Make provision for hardware and provide required internal reinforcing. Provide channel reinforcing in frames and steel bar reinforcing for hardware anchorage.

F. Apply coat of bituminous paint 30-mil dry film thickness on concealed aluminum surfaces in contact with cementitious or dissimilar materials.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine supporting structure and conditions under which aluminum entrances are to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install aluminum doors and frames in accordance with reviewed shop drawings and manufacturer's printed instructions. Ensure assemblies are plumb, level and free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

B. Use sufficient anchorage devices which will conform with performance requirements and permit movements which are intended or necessary to securely and rigidly fasten door and frame assemblies to building. Install slip-joint linings wherever possible.

C. Install batt insulation in shim spaces around perimeter of exterior door and frame assemblies, to maintain continuity of thermal barrier.

END OF SECTION

SECTION 081400
WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Prefinished solid core flush wood doors:
   a. Fire-rated flush wood doors.
   b. Non-rated flush wood doors.
2. Shop priming of field-painted doors.
3. Factory finishing flush wood doors.

B. Related Sections:

1. Section 064000 - Architectural Woodwork: Wood veneer and facing.
2. Section 081113 - Hollow Metal Doors and Frames.
3. Section 087100 - Door Hardware.
4. Section 099000 - Painting: Painted finish.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts.
5. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.
7. Fire-protection ratings for fire-rated doors.

C. Samples:

1. Wood Veneer with Transparent Finish: Provide set of 3 samples, approximately 8 by 10 inches, showing typical range of color and grain to be expected in finished work.
2. Opaque Factory-Finishes: Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish.

1.3 INFORMATIONAL SUBMITTALS

A. Certification: Submit certification that doors and frames comply with NFPA 252 or UL-10.

1.4 QUALITY ASSURANCE

A. Comply with requirements of referenced standard and manufacturer's written instructions.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting

1. Stack wood doors as recommended by door manufacturer.
2. Use opaque plastic sheeting for natural finished doors.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings

1.6 PROJECT CONDITIONS

A. Delivery, Handling and Storage: Protect wood doors from damage, dust and dirt. Do not deliver, receive, store or install wood doors until storage and installation areas are conditioned in accordance with requirements and recommendations of AWS.

B. Environmental Requirements:

1. Do not deliver, receive, store or install architectural woodwork until building is enclosed, wet work is complete, and temporary or permanent HVAC systems are operating in areas where woodwork is stored and installed and are maintaining temperature and relative humidity at occupancy levels and within the following ranges during the remainder of the construction phase:
   a. Temperature Range: Between 60 and 90 deg F.
   b. Relative Humidity Range: Between 25 and 55 percent.
2. Monitor, Record and Report: Monitor temperature and relative humidity in areas where woodwork is stored and installed at Project site. Record temperature and relative humidity prior to delivery, throughout storage period and installation, and after installation until time of Substantial Completion. Report recorded values in accordance with Submittals requirements.

1.7 WARRANTY

A. Special Warranty: Signed by Manufacturer, Installer, and Contractor, in which Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
   b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 or UL-10C.

1. Provide gasket as required by door manufacturer in compliance with UL-10C, Category A.
2. Oversize, Fire-Rated Wood Doors: For door assemblies exceeding sizes of tested assemblies, provide oversize fire door label or certificate of inspection, from a testing and inspecting agency acceptable to authorities having jurisdiction, stating that doors comply with requirements of design, materials, and construction.
3. Fire-Rated Wood Door and Frame Assembles: Provide wood doors and frames which are identical in materials and construction to units tested in door and frame assemblies in accordance ASTM E152 and which are labeled and listed for ratings indicated by UL or other testing and inspection agency acceptable to authorities having jurisdiction.

B. Temperature Rise Rating: At stairwell enclosures, provide doors which have Temperature Rise Rating of 450 degrees F maximum in 30 minutes of fire exposure.

2.2 WOOD DOORS, GENERAL

A. Quality Standards: Provide wood doors fabricated and installed in accordance with specified Grade classification of the *Architectural Woodwork Standards, Adopted and Published jointly by Architectural Woodwork Institute, Architectural Woodwork Manufacturer's Association of Canada and Woodwork Institute - Current Edition* (AWS)

1. Comply with AWS Premium Grade, except where more stringent requirements are indicated in the Contract Documents.

B. Source Limitations: Obtain flush wood doors from single manufacturer.

C. Manufacturers:
   1. VT Industries
   2. Eggers Industries
   3. Marshfield Door Systems
   4. Algoma Group

D. WDMA I.S.1-A Performance Grade: Extra Heavy Duty

E. Structural-Composite-Lumber-Core Doors:
   1. Structural Composite Lumber: WDMA I.S.10.
      a. Screw Withdrawal, Face: 700 lbf.
      b. Screw Withdrawal, Edge: 400 lbf.

F. Mineral-Core Doors: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
   1. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated.

G. Construction: Five plies.

H. Adhesives: Type I per WDMA TM-6, waterproof.

2.3 DOOR FACING AND FINISHES

A. Shop-Finished Doors: Provide finished doors which have been final finished in shop prior to shipping.
   1. Seal faces, all four edges, edges of cutouts, and mortises with first coat of finish.

B. Wood-Veneer Faced Doors with Transparent Finish: Premium Grade AA.
   1. Wood Species and Finish:
      a. Matching wood, as specified in Section 064000 - Architectural Woodwork.
   2. Thickness: 1/50 inch thick before final sanding.
   3. Veneer Matching:
      a. Match between Veneer Leaves: Book match.
      b. Assembly of Veneer Leaves on Door Faces: Balance match.
      c. Pair and Set Match: Provide for doors hung in same opening.
      d. Room Match: Match door faces within each separate room or area of building.
      e. Blueprint Match: Where indicated, provide doors with faces produced from same flitches as adjacent wood paneling and arranged to provide blueprint match with wood paneling. Comply with requirements in Section 064000 - Architectural Woodwork.
      f. Exposed Vertical and Top Edges: Same species as faces.
   4. Transparent Finish: Shop-applied, AWS Premium Grade, System 5 Conversion Varnish.
      a. Pre-finish woodwork at shop, defer only final touchup, cleaning, and polishing until after installation.
      b. Finish all surfaces, faces and edges of architectural woodwork.
         1) Backpriming: Apply two coats of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork.
      c. Sheen: Matching Architect's sample.

C. Closed-Grain Hardwood Faced Doors with Opaque Painted Finish:
   1. Wood Species and Finish: Natural birch or poplar as specified in Section 064000 - Architectural Woodwork.
   2. Shop prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Section 099000 - Painting.

D. MDF Panel Doors with Opaque Painted Finish: Provide wood doors to architectural woodwork Fabricator for application of wood composite panel cladding and shop-applied finish, including doors required for mockups.
   1. Wood Composite Panel and Finish: provided by Section 064000 - Architectural Woodwork .
   2. Shop-Finished Doors: Provide finished doors which have been final finished in shop prior to shipping.

2.4 ACCESSORIES

A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.
   1. Facing and Crossband Adhesive: Type 1 waterproof.
   2. Door Construction: Type 2.

B. Vision Frames:
   1. Non-rated doors: Flush wood frames, hardwood to match facing.
   2. 20 minute fire rated doors: Flush wood frames, hardwood to match facing
   3. Fire-rated doors: UL approved wood veneer stop system.
   4. Glass: Refer to Section 088000 for glass types.

2.5 FABRICATION

A. Fabricate wood doors in accordance with requirements of specified AWS Grade.

B. Fabricate Work of this Section using materials, methods and quality control procedures necessary for installed units to withstand dimensional changes that can be expected resulting from temperature and humidity variations at project location when interior spaces do not have humidity control. Seal each surface to help mitigate dimensional change resulting from temperature and humidity variations.

C. Fabricate and label fire-rated doors in accordance with requirements of Underwriters' Laboratories (UL), UL-10C, Category A Positive Pressure, with intumescent required for compliance contained within the door (concealed) and requiring no additional installation of intumescent products.

D. Fabricate doors with hardware blocking as follows:
   1. Provide head and sill rails on all doors.
   2. Provide adequate blocking for doors specified with concealed overhead stops and surface mounted closers.
   3. Provide lock-block at fire-rated, mineral core doors at latch side only.
   4. Provide cross blocking only when exit devices are specified for door.
   5. Provide hook block for pivots, or when floor bolts are specified under Section 087100 - Door Hardware.

E. Provide doors with minimum 1-1/4 inch thick edge strips, of wood species to match face veneers except as required for UL rating.

F. Make cut-outs and provide stops for glass and louvers. Seal cut-outs prior to installation of moldings.
   1. For full light doors: Provide cut out from flush wood door, with vertical grain direction.

G. Bevel strike edge of single acting doors 1/8 inch in 2 inches. Radius strike edge of double-acting swing doors 2-1/8 inches.

H. Prepare doors to receive hardware. Refer to Section 087100 – Door Hardware and NFPA 80 for hardware requirements including UL-10C.
   1. Factory pre-machine doors for all mortised hardware, including pilot holes for hinge screws and lock fronts.
   2. Prefit and bevel to net opening size less approximately 3/16 inch in width and provide 1/4 inch clearance above finished floor, unless otherwise indicated on drawings.
   3. Slightly ease vertical edges.

I. Fire Rated Pair of Doors; greater than 20 minute: If astragal is required, to comply with fire rated labeling requirements for pairs of fire rated doors, provide door manufacturer's standard tested astragal.
   1. Shop apply astragals.
   2. Shop apply matching veneer wrap to conceal metal astragal at wood faced doors.
   3. Install concealed intumescent seals per UL-10C where required by code.

2.6 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Section 099000 - Painting.

B. Doors for Transparent Finish: Shop prime faces and all four edges with stain (if required), other required pretreatments, and first coat of finish as specified in Section 099300 "Staining and Transparent Finishing." Seal edges of cutouts and mortises with first coat of finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examination and Acceptance of Conditions: Before proceeding with installation, examine openings to receive wood doors and other conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Material Moisture Content and Environmental Requirements: Comply with recommendations of AWS Woodwork Standards.
    a. Do not install woodwork that has not been conditioned to average prevailing humidity conditions in installation areas.
3. Reject doors with defects.
4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions. Architectural woodwork Installer shall approve substrate prior to installation.

3.2 INSTALLATION

A. Hardware: For installation, refer to Section 087100 - Door Hardware.

B. Installation Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.

1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
2. Install smoke- and draft-control doors according to NFPA 105.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.

1. Clearances: Provide 1/8 inchat heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold.
2. Comply with NFPA 80 for fire-rated doors.
3. Factory-Finished, Job-Fitted Doors: Restore finish before installation if fitting or machining is required at Project site.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

E. Acoustically-Rated Wood Doors:

1. Undercut of door shall be 3/8-inch maximum for doors to be equipped with automatic door bottoms (sound seals).
2. Contractor shall adjust all sound seals for positive light-proof seal to adjacent jambs, head and sill conditions.
3. Rough framed openings in drywall partitions for hollow metal frames scheduled to be fitted with acoustical seals but not having an STC rating shall be fabricated from back-to-back 18-gauge studs, or double 2x wood studs.
4. Tightly caulk openings between steel frame and adjoining partition with clear silicone sealant.
5. Apply clear silicone sealant to all jamb and head seals prior to application of seals to frame.

F. Ensure that smoke and sound gaskets are in-place before prefinished door installation.

3.3 INSTALLED WORK

A. Damaged or Non-Compliant Work: Remove and replace materials that are damaged or do not comply with requirements.
   1. Damaged finish may be repaired or refinished if resulting repair work complies with requirements and shows no evidence of repair or refinishing.

B. Adjusting: Adjust movable components to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range, and without binding or damaging assembly components.
   1. Lubricate hardware and moving parts in accordance with Manufacturer's written instructions.
   2. Operation: Rehang or replace doors that do not swing or operate freely.

C. Cleaning: Clean and maintain installed work as frequently as necessary through the remainder of the construction period.

D. Protection: Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
   1. At clear finished doors, do not partially cover door surfaces with paper, cardboard, or other opaque covering that will create uneven aging of wood veneer.

E. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 083100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Access panels and accessories.
   2. Ceiling access doors.

B. Related Sections:
   1. Section 092200 – Supports for Gypsum Board.
   2. Section 092900 - Gypsum Board.
   3. Section 099000 – Painting: Field painting.

1.2 SUBMITTALS

A. Product Data: For each type of door and frame indicated. Include construction details relative to materials, individual components and profiles, finishes, and fire ratings (if required) for access doors and frames.

B. Shop Drawings: Submit for each item of work in accordance with Section 013300 showing location and size of proposed access panels.

C. Schedule: Provide complete access panel schedule, including types, general locations, sizes, construction details, latching or locking provisions, and other data pertinent to installation.

1.3 QUALITY ASSURANCE

A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics per the following test method and that are labeled and listed by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction:
   1. NFPA 252 for vertical access doors.
   2. ASTM E119 or UL 263 for horizontal access doors and frames.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver and protect as required during handling to preclude damage. Replace damaged units.

1.5 COORDINATION

A. Provide panels as part of this Contract needed to access concealed equipment and controls whether shown on drawings or not.

B. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed equipment, and indicate on schedule specified in "Submittals" Article.

C. Provide one universal keyway for all access door and/or panel types. Contractor to coordinate between trades, where applicable.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Milcor Inc.
   2. Nystrom Building Products
   3. Bilco
   4. Babcock-Davis
   5. Karp Associates Inc.

6. J.L. Industries
7. Cesco Access Products
8. Williams Brothers Corporation of America

2.2 ACCESS PANELS

A. Non-rated, flush metal access panel.
   1. Milcor: Style DW Metal Access Door flush panel for gypsum board.
   2. Accessories: Cylinder lock.
   3. Factory Finish: Prime coat.

B. Fire rated, flush metal access panel complying with UL, and self-closing door.
   1. Milcor: Style URF flush panel for gypsum board,
   2. Provide fire-rated access doors, B label at fire rated walls or ceilings.
   3. Accessories: Cylinder lock.
   4. Factory Finish: Prime coat.

C. Non-rated, recessed metal access panel for gypsum panel infill.
   1. Milcor: Style DWR recessed panel for gypsum board.
   2. Accessories: Cylinder lock.
   3. Factory Finish: Prime coat.

D. Non-rated, flush metal, stainless steel access panel.
   1. Milcor: Style DW flush panel for gypsum board,
   2. Accessories: Cylinder lock.
   3. Factory Finish: Stainless steel.

2.3 FABRICATION

A. Weld and grind smooth joints of fabricated components.

B. Form exposed surfaces from one sheet of stock, free of joints.

C. Provide steel anchor plates and anchor components for installation of building finishes.

D. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

E. Back paint components where contact is made with building finishes to prevent electrolysis.

F. Hot dip galvanized ferrous metal anchors and fastening devices.

G. Shop assemble components and package complete with anchors and fittings.

PART 3 EXECUTION

3.1 PREPARATION

A. Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates and rough-in measurements as required.

B. Before starting work notify Architect in writing of conflicts detrimental to installation or operation of units.

C. Verify with Architect location of access panels.

D. Advise installers of other work about specific requirements relating to access panel and floor door installation, including sizes of openings to receive access panel or access door and frame, as well as locations of supports, inserts, and anchoring devices.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access panels and frames, and floor doors and frames.

B. Install plumb, square and level, securely fastened, properly anchored and ready for full, complete operation and use.

C. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.

D. Install access doors with trimless frames and floor doors flush with adjacent finish surfaces or recessed to receive finish material.

E. Adjust and lubricate operating parts for proper operation.

3.3 ACCESS PANEL SCHEDULE

A. General: The following are general recommendations for selecting access panel types and sizes, unless noted otherwise or as indicated on the drawings. Access panels typically are located for access to mechanical equipment and controls, located above hard ceilings (gypsum board) or walls of differing construction and finishes. Confirm access panel type, size and location with the Architect.

B. Type:

1. Flush Metal: Typical non-rated hard ceilings and walls.
2. Rated Flush Metal: Fire rated construction as noted on the drawings
3. Recessed Metal with Panel Infill: Lobbies, reception rooms, conference rooms, lecture halls.
4. Flush Stainless Steel: Tiled walls, commercial kitchens.

C. Size by access requirement:

1. 12 inch by 12 inch: Hand access.
2. 18 inch by 18 inch: Arm access.
3. 24 inch by 24 inch: Arm and head access.
4. 30 inch by 24 inch: Head and torso access.
5. 36 inch by 36 inch: Ladder access.

D. Ceiling or wall access panels required to access a mechanical access panel (MAP), access panel should be slightly larger than the (MAP) and centered on the panel.

END OF SECTION

SECTION 087100
DOOR HARDWARE

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Provide items, articles, materials, operations and methods listed, mentioned or scheduled herein or on drawings, in quantities as required to complete project. Provide hardware that functions properly.

B. Related Sections:

1. Section 064000 – Architectural Woodwork
2. Section 081113 – Hollow Metal Doors and Frames
3. Section 081116- Aluminum Doors and Frames

1.2 QUALITY ASSURANCE

A. Manufacturer: Obtain each type of hardware (ie. latch and locksets, hinges, closers) from single manufacturer, although several may be indicated as offering products complying with requirements.

B. Supplier: Recognized architectural finish hardware supplier, with warehousing facilities, who has been providing hardware for period of not less than 3 years. The supplier shall be, or employ, a certified Architectural Hardware Consultant (AHC), who is registered in the continuing education program as administered by the Door and Hardware Institute. The hardware schedule shall be prepared and signed by a certified AHC.

C. Installer: Firm with 3 years experience in installation of similar hardware to that required for this project, including specific requirements indicated.

D. Regulatory Label Requirements: Provide nationally recognized testing agency label or stamp on hardware for labeled openings.

E. Furnish UL listed hardware for all labeled and 20 min. openings in conformance with the requirements for the class of opening scheduled. Underwriters' requirements shall haveprecedence over specification where conflicts exist.

F. Manufacturers and model numbers listed are to establish a standard of function and quality. Similar items by approved manufacturers that are equal in design, function, and quality, may be considered for prior approval of the architect, provided the required data and physical samples are submitted for approval as set forth in Division One General Requirements.

G. Obtain each type of hardware (hinges, latch & locksets, exit devices, closers, etc.) from asingle manufacturer, although several may be indicated as offering products complying with requirements.

H. All hardware items shall be manufactured no earlier than 6 months prior to delivery tosite.

I. Hardware supplier shall participate when reasonably requested to meet with the contractor and or architect to inspect any claim for incorrect or non-functioning materials; following such in- spection, the hardware supplier shall provide a written statement documenting the cause and proposed remedy of any unresolved items.

1.3 REFERENCES

A. Publications of agencies and organizations listed below form a part of this specification section to the extent referenced.

1. DHI - Recommended Locations for Builders' Hardware.
2. NFPA 80 - Standards for Fire Doors and Windows.
3. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures.
4. UL - Building Material Directory.
5. DHI - Door and Hardware Institute

6. WHI - Warnock Hersey
7. BHMA - Builders Hardware Manufacturers Association
8. IBC - International Building Code Currently Adopted Edition (as amended by local building code).

1.4 SUBMITTALS

A. Submit detailed hardware schedule per 013300 Submittal Procedures.

B. Schedule format shall be consistent with recommendations for a vertical format as set forth in the Door & Hardware Institute's (DHI) publication "Sequence and Format for the Hardware Schedule". Hardware sets shall be consolidated to group multiple door openings which share similar hardware requirements. Schedule shall include the following information:

1. Door number, location, size, handing and rating
2. Door and frame material, handing
3. Degree of swing
4. Manufacturer
5. Product name and catalog number
6. Function, type and style
7. Size and finish of each item
8. Mounting heights
9. Explanation of abbreviations, symbols, etc
10. Numerical door index, indicating the hardware set/group number for each door.

C. When universal type door closers are to be provided, the schedule shall indicate the application method to be used for installation at each door (regular arm, parallel arm or top jamb).

D. The schedule will be prepared under the direct supervision of a certified ArchitecturalHardware Consultant (AHC) employed by the hardware distributor. The hardware schedule shall be signed and embossed with the DHI certification seal of the supervising AHC. The supervising AHC shall attend any meetings related to the project when requested by thearchitect.

E. Check the specified hardware for suitability and adaptability to the details and surrounding conditions.

F. Review the drawings from related trades as required to verify compatibility with specified hardware. Indicate unsuitable or in compatible items, and proposed substitutions in the hardware schedule.

G. Provide documentation for all hardware to be furnished on labeled fire doors indicating compliance with positive pressure fire testing UL 10C.

H. Submit a sample of each type of hardware requested by the Architect. Samples shall be of the same finish, style and function specified. Tag each sample with its permanent location so that it may be used in the final work.

I. Furnish approved hardware schedules, template lists, and pertinent templates as requested by related trades.

J. Furnish necessary diagrams, schematics, voltage and amperage requirements for all electro-mechanical devices or systems as required by related trades. Wiring diagrams shall be opening specific and include both a riser diagram and point to point diagram showing all wiring terminations.

K. After receipt of approved hardware schedule, Hardware supplier shall initiate a meeting including the owner's representative to determine keying requirements. Upon completion of the initial key meeting, hardware supplier shall prepare a proposed key schedule with symbols and abbreviations as set forth in the door and hardware institute's publication "Keying Procedures, Systems, and Nomenclature". Submit copies of owner approved key schedule for review and field use in quantities as required by Division 1 - General Conditions. Wiring diagrams shall be included in final submittals transmitted for distribution and field use.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver hardware required to be installed during fabrication of hollow metal, aluminum, wood, or stainless steel doors prepaid to the respective manufacturer.

B. All hardware shall be delivered in manufacturers' original cartons and shall be clearly marked with set and door number.

C. Coordinate with contractor prior to hardware delivery and recommend secure storage and protection against loss and damage at job site.

D. Contractor shall receive all hardware and provide secure and proper protection of all hardware items to avoid delays caused by lost or damaged hardware. Contractor shall report shortages to the Architect and hardware supplier immediately after receipt of material at the jobsite.

E. Coordinate with related trades under the direction of the contractor for delivery ofhardware items necessary for factory installation.

1.6 PRE-INSTALLATION MEETING

A. Schedule a hardware pre-installation meeting on site to review and discuss the installation of continuous hinges, locksets, door closers, exit devices, overhead stops, and electromechanical door hardware.

B. Meeting attendees shall be notified 7 days in advance and shall include: Architect, Contractor, Door Hardware Installers (including low voltage hardware), Manufacturers representatives for above hardware items, and any other effected subcontractors or suppliers.

C. All attendees shall be prepared to distribute installation manuals, hardware schedules, tem- plates, and physical hardware samples.

1.7 WARRANTY

A. Guarantee workmanship and material provided against defective manufacture. Repair or replace defective workmanship and material appearing within period of one year after Substantial Completion.

B. Provide a minimum ten year factory warranty on door closer body against defects in material and workmanship from date of occupancy of Project.

C. Replace shortages and incorrect items with correct material at no additional cost to Owner.

PART 2 PRODUCTS

2.1 FASTENERS

A. All exposed fasteners shall be Phillips head or as otherwise specified, and shall match thefinish of the adjacent hardware. All fasteners ex-posed to the weather shall be non-ferrous or stainless steel. Furnish correct fasteners to accommodate surrounding conditions.

B. Coordinate required reinforcements for doors and frames. Seek approval of the architect prior to furnishing through-bolts. Furnish through-bolts as required for materials not readily reinforced.

2.2 BUTTS AND HINGES

A. Hinges: Where hinges are indicated, provide ball-bearing hinges of size, quantity, and duty level as recommended by manufacturer, unless specifically noted otherwise. Acceptable manufacturers: Bommer, Hager, Ives, McKINNEY, PBB, and Stanley. Provide non-removable pins (NRP) for reverse bevel doors that lock.

B. Acceptable manufacturers and respective catalog numbers:

	Ives	Stanley	Hager	McKinney
1. Standard Weight, Plain Bearing	5PB1	F179	1279	T2714
2. Standard Weight, Ball Bearing	5BB1	BB179	BB1279	TB2714
3. Standard Weight, Ball Bearing, Non-Ferrous	5BB1	FBB191	BB1191	TB2314
4. Heavy Weight, Ball Bearing	5BB1HW	FBB168	BB1168	T4B3786
5. Heavy Weight, Ball Bearing, Non-Ferrous	5BB1HW	FBB199	BB1199	T4B3386

C. Unless otherwise specified, furnish the following hinge quantities for each door leaf
   1. 3 hinges for doors up to 90 inches.
   2. 1 additional hinge for every 30 inches on doors over 90 inches.

D. Unless otherwise specified, furnish hinge weight and type as follows:
   1. Standard weight: plain bearing hinge 5PB1 for interior openings through 36 inches wide without a door closer.
   2. Standard weight: ball bearing hinge 5BB1 for interior opening over 36 through 40 inches wide without a door closer, and for interior openings through 40 inches wide with a door closer.
   3. Heavyweight: 4 ball bearing hinge 5BB1HW for interior openings over 40 inches wide, and for all vestibule doors.
   4. Heavyweight: 4 ball bearing hinge 5BB1HWss for exterior openings unless otherwise listed in groups.

E. Unless otherwise specified, furnish hinges for exterior doors, fabricated from brass, bronze, or stainless steel. Unless otherwise specified, hinges for interior doors may be fabricated from steel.

F. Unless otherwise specified, furnish hinges in the following sizes:
   1. 5" x 5" 2-1/4" thick doors.
   2. 4-1/2" x 4-1/2" 1-3/4" thick doors.
   3. 3-1/2" x 3-1/2" 1-3/8" thick doors.

G. Furnish hinges with sufficient width to accommodate trim and allow for 180-degree swing.

H. Unless otherwise specified, furnish hinges with flat button tips with non-rising pins at interior doors, non-removable loose pins (NRP) at exterior and out-swinging interior doors.

I. Unless otherwise specified, furnish all hinges to template standards.

2.3 CONTINUOUS PIN AND BARREL HINGES

A. Acceptable manufacturers and respective catalog numbers:

	Ives	Marker
1. Edge Mount Pin & Barrel Stainless Steel Continuous Hinge	700 Series	300 Series
2. Edge Mount Hinge/Guard Pin & Barrel Stainless Steel Continuous Hinge	705 Series	HG-305
3. Stainless Steel Double Edge Guard	7302	EG-308

B. Continuous hinges shall be full height pin and barrel type hinge providing full height door support up to 600 lbs. Edge mount (unless noted otherwise).

C. Construct hinges of heavy-duty 14-gauge material. The stainless internal pin shall have a diameter

of 0.25 and the exterior barrel diameter of 0.438.

D. Hinge shall be non-handed with symmetrical template hole pattern and factory drilled. Hinge must accept a minimum of 21 fasteners on the door and 21 fasteners on the frame.

E. Each knuckle to be 2 inch, including split nylon bearing at each separation for quiet, smooth, self-lubricating operation.

F. Hinge to be able to carry Warnock Hersey Int. or UL for fire rated doors and frames up to 3 hours.

G. Provide machine screws for doors which have been reinforced to accept machine screws.

H. Note: Fire label for doors and frames should be placed on the header and top rail of fire rated doors and frames.

I. Provide adjusting screws equal to Ives “Adjust-a-Stud” for continuous hinges specified as 705. Adjustment to be able to correct frame fit problems up to 3/8 inch.

2.4 POWER TRANSFERS

A. Acceptable manufacturers and respective catalog numbers:

		Von Duprin
1.	Concealed Two Wire	EPT-2
2.	Concealed Ten Wire	EPT-10
3.	Armored Door Cord Four Wire	788C-12
4.	Armored Door Cord Four Wire	788C-18

B. Door cords shall be armored cable with screw on caps.

C. Concealed power transfers shall be concealed in the door and frame when the door is closed.

D. Concealed power transfers shall have a steel tube to protect wires from being cut.

E. Concealed power transfers with spring tubes shall be rejected.

F. Concealed power transfers shall be supplied with a mud box to house all terminations

2.5 FLUSH BOLTS AND DUSTPROOF STRIKES

A. Acceptable manufacturers and respective catalog numbers:

		Ives	Door Controls	Hager
1.	Dust Proof Strike	DP2	80	280X
2.	Auto Flush Bolt (Metal	FB31P	842	292D
3.	Auto Flush Bolt (Wood	FB41P	942	291D
4.	Manual Flush Bolt	FB458	780	282D

B. Unless otherwise specified, provide 12" rods for manual flush bolts for door 7'6" or less, 24"top rods for doors over 7'6" to 8'6".

C. Unless otherwise specified, provide doors over 8'6" with automatic top bolts.

D. Provide automatic flush bolts where required to maintain fire door listing and or egress requirements on pairs of doors.

E. All flush-bolt applications shall be UL listed to be installed with top flush bolt only. Provide auxiliary fire bolt as required for fire rated openings where less bottom bolt has been specified.

F. Provide all bottom flush bolts with non-locking dust proof strikes.

2.6 EXIT DEVICES

A. Acceptable manufacturers and respective catalog numbers:

		Von Duprin	No Substitutions
1.	Wide Stile, Push Pad	98/99 Series	
2.	Wide Stile, Electric Latch Retraction (motor driven)	QEL 98/99 Series	

3. Lever Trim 996 Series
4. Pull Trim 990 Series

B. Obtain exit devices from a single manufacturer, although several maybe indicated as offering products complying with requirements.

C. All exit devices shall be equipped with a sound-dampening feature to reduce touch padreturn noise.

D. Quiet Electric Latch Retraction shall be accomplished using a motor driven assembly, andshall incorporate the following features:

1. Motor shall retract both the push pad assembly and latchbolt.
2. Automatic calibration of latch throw and pull.
3. Built-in time delay.
4. On-board installation and troubleshooting diagnostics built into power supplyand device.
5. Retry mode if device does not pull on the first try.

E. On full glass doors there shall be no exposed fasteners on the back of the mechanismvisible through the glass.

F. All exit devices shall be provided with flush end caps to reduce potential damage fromimpact.

G. All exit devices shall be provided with dead-locking latch bolts to insure security.

H. All exit devices shall be U.L. listed for accident hazard. Exit device for use on fire doorsshall also be U.L. listed for fire exit hardware.

I. Provide optional strikes, special length rods, and adapter plates to accommodate door and frame conditions. Provide narrow style series devices in lieu of wide stile series devices where optional strikes will not accommodate door and frame conditions.

J. Coordinate with related trades to insure adequate clearance and reinforcement is providedin doors and frames. Provide thru bolts as required.

K. Refer to hardware groups for exit device applications utilizing the option of: "less bottomrod and floor strike" (LBR).

L. All exit devices shall be provided with optional trim designs to match other lever and pulldesigns used on the project.

M. Unless specific exit device dogging options are noted within hardware sets, provide dogging options as follows:

N. Fire Rated devices: Dogging not permitted.

O. Non-Rated Exit Only functions not equipped with outside trim or pull: Less Dogging.

P. Non-Rated Classroom functions: Less Dogging.

Q. Non-Rated devices utilizing electric latch retraction or electrified outside trim: Less Dogging.

R. All Other Non-Rated devices: Cylinder Dogging utilizing interchangeable core cylinders.Cylinder keyway shall match locksets furnished on this project.

S. Provide glass bead kits as required to accommodate door conditions. Screws shall not be visible through full glass doors.

T. Where specified, provide compatible keyed mullions with cylinder for pairs ofdoors.

U. Provide reinforced crossbars for all traditional style exit devices appliedto doors over 36" wide.

2.7 LOCKS AND LATCHES

A. Acceptable manufacturers and respective catalog numbers:

Schlage No Substitution

1. Grade 1 Mortise L Series 17A

B. Minimize transmission of heat to lock trim. Provide temperature control modules (TCM) on all electrified locks when cataloged by the lock manufacturer.

C. Unless otherwise specified, all locks and latches to have:
   1. 2-3/4" Backset
   2. 1/2" minimum throw latchbolt
   3. 1" throw deadbolt
   4. ANSI A115.2 strikes

D. Provide guarded latch bolts for all locksets, and latch bolts with sufficient throw to maintain fire rating of both single and paired door assemblies.

E. Length of strike lip shall be sufficient to clear surrounding trim.

F. Provide wrought boxes for strikes at inactive doors, wood frames, and metal frames without integral mortar covers.

2.8 PULLS, PUSH BARS, PUSH/PULL PLATES

A. Acceptable manufacturers and respective catalog numbers:

		Ives	Burns	Hager
1.	Straight Pull (1" dia., 10" ctc)	26C	4J	8103-0
2.	Straight Pull (3/4” dia., 8” ctc)	25B	3G	8102-8
3.	Offset Door Pull (1" dia., 10" ctc)	39C	12J	8190-0
4.	Pull / Push-Bar (1" dia., 10" ctc Pull)	422 x 26C	153	9103-0
5.	Offset Pull / Push-Bar (1" dia., 10" ctc	422 x 39C	157	9190-0
6.	Push Plate (.050 4"X 16")	54	30S 4 x 16	8200 4 x 16
7.	Push Plate (.050 6"X 16")	56	30S 6 x 16	8200 6" X 16"
8.	Pull Plate (1" dia., 10" ctc - .050" X 4" X 16")	5426C	34J 4 x 16	8303-0 4" X 16"

B. Adjust dimensions of push plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, push plates shall be factory drilled for cylinders or other mortised hardware. All push plates shall be beveled 4 sides and counter sunk.

C. Where possible, provide back-to-back, and concealed mounting for pulls and push bars. Push bar length shall be 3" less door width, or center of stile to center of stile for stile & rail or full glass doors.

2.9 COORDINATORS

A. Acceptable manufacturers and respective catalog numbers:

		Ives	Door Controls	Hager
1.	Bar Coordinator	COR x FL	600 x Filler	297D x 297F
2.	Mounting Bracket	MB Series	AB, C Series	297 Series

B. Provide coordinators at all pairs of doors having automatic flush bolts and closers on the inactive leaf, and for pairs of doors having vertical rod/mortise exit device combinations with overlapping astragals.

C. Provide appropriate filler bars, closer mounting brackets, carrybars, and special top latch preparations as required by adjacent hardware.

2.10 CLOSERS

A. Acceptable manufacturers and respective catalog numbers:

	LCN	Sargent	No Substitutions
1.	4011/4111EDA	281/281P10	

B. Obtain door closers from a single manufacturer, although several may be indicated as offering products complying with requirements.

C. Provide extra heavy duty arm (EDA / HD) when closer is to be installed using parallel arm mounting.

D. Closers shall use high strength cast iron cylinders, forged main arms, and 1 piece forged steel pistons.

E. Closers shall utilize a stable fluid withstanding temperature range of +120deg F to -30deg F without seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with standards UL10C.

F. Unless otherwise specified, all door closers shall have full covers and separate adjusting valves for sweeps, latch, and backcheck.

G. Provide closers for all labeled doors. Provide closer series and type consistent with other closers for similar doors specified elsewhere on the project.

H. Provide closers with adjustable spring power. Size closers to insure exterior and fire rated doors will consistently close and latch doors under existing conditions. Size all other door closers to allow for reduced opening force not to exceed 5 lbs.

I. Install closers on the room side of corridor doors, stair side of stairways and interior side of exterior doors.

J. Closers shall be furnished complete with all mounting brackets and cover plates as required by door and frame conditions, and by adjacent hardware.

K. Door closers shall be provided with a powder coat finish to provide superior protection against the effects of weathering. Powder coat finish shall successfully pass a 100 hour salt spray test.

L. Pressure Relief Valve, PRV, shall not be acceptable.

2.11 LOW ENERGY ELECTRO-HYDRAULIC AUTOMATIC OPERATORS

A. Acceptable manufacturers and respective catalog numbers electric strikes:

		LCN	No Substitution
1.	Electro-Hydraulic Operator	4640	

B. Where low kinetic energy, as defined by ANSI/BHMA Standard A156.19, power operators are indicated for doors required to be accessible to the disabled, provide electrically powered operators complying with the ADA for opening force and time to close standards.

C. The closing action shall be controlled by modern type cast iron door closer cylinder filled with a flat viscosity fluid, stable from +120F to -30F that would require no seasonal adjustments. The closer shall have field adjustable spring power; have two independent closing speed adjustment valves, and hydraulic backcheck.

D. Full closing force shall be provided when the power or assist cycle ends.

E. All power operator systems shall include the following features and functions:

1. Provisions for separate conduits to carry high and low voltage wiring in compliance with the National Electrical Code, section 725-31.

2. The operator will be designed with an electronically controlled mechanical clutching mechanism to prevent damage to the operator if the system is actuated while the door is latched or if the door is forced closed during the opening cycle.
3. All covers, mounting plates and arm systems shall be powder coated and successfully pass a minimum of 100 hours testing as outlined in ANSI/BHMA Standard A156.18.
4. UL listed for use on labeled doors.
5. All operators shall be non-handed with spring power over a range of at least four sizes; either 1 through 4 or 2 through 5.
6. The power operator shall incorporate microprocessor controlled digital controls including: factory default memory settings, on-board diagnostics, non-volatile memory, and inte- grated delay and relay for controlling door release devices.
7. Provisions in the control box or module shall provide control {inputs and outputs) for; electric strike delay, auxiliary contacts, sequential operation, fire alarms systems, actuators, swing side sensors, and stop side sensors.
8. Wall mounted actuators shall consist of a 4-1/2 inch diameter stainless steel touch plate with a blue filled handicapped symbol. Switches shall be weather resistant and mount on a single gang electrical box furnished by Division 26.

F. All electrically powered operators shall include the following features or functions:
1. When an obstruction or resistance to the opening swing is encountered, the operator will pause at that point, then attempt to continue opening the door. If the obstruction or resistance remains, the operator will again pause the door.
2. Easily accessible main power and maintain hold open switches will be provided on the operator.
3. An electronically controlled clutch to provide adjustable opening force.
4. A microprocessor to control all motor and clutch functions.
5. An on-board power supply capable of delivering both 12V and 24V outputs up to a maxi- mum of 1.0 ampere combined load.
6. All input and output power wiring shall be protected by slow blow fuses. These fuses shall be easily replaceable without special tools or component replacement.
7. If electrical failure occurs, the unit shall operate as a standard door closer.

G. Power Operators shall be warranted by the manufacture to be free from defects in material and workmanship for a period of two years.

2.12 KICKPLATES AND MOP PLATES

A. Furnish protective plates as specified in hardware groups.

B. Where specified, provide 10" kick plates, 34" armor plates, and 4" mop plates. Unless otherwise specified, metal protective plates shall be .050" thick; plastic plates shall be 1/8" thick.

C. Protective plates shall be 2" less door width, or 1" less door width at pairs. All protective plates shall be beveled 4 sides and counter sunk. Protection plates over 16" shall not be provided for labeled doors unless specifically approved by door manufacturers listing.

D. Where specified, provide surface mounted door edges. Edges shall butt to protective plates. Provide edges with cutouts as required adjacent hardware.

E. Adjust dimensions of protection plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, protection plates shall be factory drilled for cylinders or other mortised hardware.

2.13 OVERHEAD STOPS

A. Acceptable manufacturers and respective catalog numbers:

	Glynn-Johnson	Rixson
1. Heavy Duty Surface Mount	GJ900 Series	9 Series
2. Heavy Duty Concealed Mount	GJ100 Series	1 Series
3. Medium Duty Surface Mount	GJ450 Series	10 Series

4.	Medium Duty Concealed Mount	GJ410	2 Series

B. Unless otherwise specified, furnish GJ900 series overhead stop for hollow metal or 1-3/4" solid core doors equipped with regular arm surface type closers that swing more than 140 degrees before striking a wall, for hollow metal or 1-3/4" solid core doors that open against equipment, casework, sidelights, or other objects that would make wall bumpers inappropriate, and as specified in hardware groups.

C. Furnish sex bolt attachments for wood and mineral core doors unless doors are supplied with proper reinforcing blocks.

D. Provide special stop only ("SE" suffix) overhead stops when used in conjunction with electronic hold open closers.

E. Do not provide holder function for labeled doors.

2.14 WALL STOPS AND HOLDERS

A. Acceptable manufacturers and respective catalog numbers:

		Ives	Hager	Burns
1.	Wrought Convex Wall Bumper	WS406CVX	232W	570
2.	Wrought Concave Wall Bumper	WS406CCV	236W	575
3.	Extended Wall Stop	WS11/WS11X	255W	530
4.	Extended Wall Stop	WS33/WS33X	****	****
5.	Automatic Wall Holder	WS40	326W	533
6.	Hinge Pin Stop	70	****	****

B. Furnish a stop or holder for all doors. Furnish floor stops or hinge pin stops only where specifically specified.

C. Where wall stops are not applicable, furnish overhead stops.

D. Do not provide holder function for labeled doors.

2.15 MAGNETIC HOLD OPENS

A. Acceptable manufacturers and respective catalog numbers:

		LCN	ABH	Edwards
1.	Wall Holder	SEM7800	2000	1500

B. Magnetic holder's housing and armature shall be constructed of a die cast zinc material.

C. Provide types as listed in groups.

D. Where wall conditions do not permit the armature to reach the magnet, provide extensions.

E. Provide proper voltage and power consumption as required by Division 26.

F. Coordinate electrical requirements and mounting locations with other trades.

2.16 WEATHERSTRIP, GASKETING

A. Acceptable manufacturers and respective catalog numbers:

		Zero	Pemko	NGP	Reese
1.	Weatherstrip	429	2891_PK	700NA	755
2.	Adhesive Gasket	188	S88	5050	797
3.	Mullion Seal/Silencer	8780	5110	5100N	
4.	Meeting Edge Seals	8193	18041	9605	959
5.	Adhesive Edge Seal	****	S77	5060	****

6.	Automatic Door Bottom (Surface Mtd.)	321	4131	222	320
7.	Automatic Door Bottom (HD Concealed) (When Sealing Against A Solid Surface)	360	434_RL	423N	430
8.	Automatic Door Bottom (HD Concealed) (When Sealing Against Carpet)	360	434_NBL	683	943
9.	Automatic Door Bottom	355	420APKL	320N	372A
10.	Sweeps	8192	18061_NB	B606	964
11.	Sweep w/ drip	8198	345_N	C627	354
12.	Drip Cap	142	346	16	R201

B. Where specified in hardware groups, furnish the above products unless otherwise detailed in groups.

C. Provide weatherstripping all exterior doors and where specified.

D. Provide intumescent and other required edge sealing systems as required by individual fire door listings to comply with positive pressure standards UL 10C.

E. Provide Zero 188 smoke gaskets at all fire rated doors and smoke and draft control assemblies.

F. Provide gasketing for all meeting edges on pairs of fire doors. Gasketing shall be compatible with astragal design provided by door supplier as required for specific fire door listings.

2.17 THRESHOLDS

A. Acceptable manufacturers and respective catalog numbers:

		Zero	Pemko	NGP	Reese
1.	Saddle Thresholds	8655	171	425	S205
2.	Half Saddle Thresholds	1674	227	324	S239
3.	Interlocking Threshold	74A	114	442-5	T550

B. Hardware supplier shall verify all finish floor conditions and coordinate proper threshold asrequired to insure a smooth transition between threshold and interior floor finish.

C. Threshold Types:

1. Unless otherwise specified, provide saddle threshold similar to Zero 8655 for all exterior openings with an interior floor finish less than or equal to 1/4" in height.
2. Unless otherwise specified, provide half saddle threshold similar to Zero 1674 for all exterior openings with an interior floor finish greater than 1/4" in height. Threshold height shall match thickness of interior floor finish.

2.18 POWER SUPPLIES

A. Provide quantities and types as specified in hardware sets. Shared power supplies will not be accepted without prior approval from the owner.

B. All power supplies shall have the following features:

1. 12/24 VDC Output, field selectable.
2. Class 2 Rated power limited output.
3. Universal 120-240 VAC input.
4. Low voltage DC, regulated and filtered.
5. Polarized connector for distribution boards.
6. Fused primary input.
7. AC input and DC output monitoring circuit w/LED indicators.
8. Cover mounted AC Input indication.
9. Tested and certified to meet UL294.
10. NEMA 1 enclosure.

11. Hinged cover w/lock down screws.
12. High voltage protective cover.

C. All power supplies shall incorporate fused distribution boards.

D. All electro-mechanical systems requiring fail safe circuits shall be capable of interfacing with the fire alarm system to cut power to appropriate system components. Unless already provided in another system component, all power supplies utilized in fail safe circuits shall include an integral relay which when connected to the N/C fire alarm contact will cut power to all openings connected to the individual power supply. Power supply, unless otherwise specified, will automatically reset itself when fire alarm relay returns to normal state following a fire alarm.

2.19 DOOR POSITION SWITCHES

A. Acceptable manufacturers and respective catalog numbers:

	Schlage Electronics	Sentrol
1. Concealed (wood & hollow metal doors)	679 Series	1076W
2. Concealed (aluminum doors)	7764	****

2.20 FINISHES AND BASE MATERIALS

A. Unless otherwise indicated in the hardware groups or herein, hardware finishes shall be applied over base metals as specified in the following finish schedule:

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HARDWARE ITEM	BHMA FINISH AND BASE MATERIAL
1. Butt Hinges: Exterior, or Non-Ferrous	630 (US32D - Satin Stainless Steel)
2. Butt Hinges: Interior	652 (US26D - Satin Chromium)
3. Continuous Hinges	630 (US32D - Satin Stainless Steel)
4. Flush Bolts	626 (US26D - Satin Chromium)
5. Exit Devices	626 (US26D - Satin Chromium)
6. Locks and Latches	626 (US26D - Satin Chromium)
7. Pulls and Push Plates/Bars	630 (US32D - Satin Stainless Steel)
8. Coordinators	600 (Prime painted or mill alum.)
9. Closers	689 (Powder Coat Aluminum)
10. Protective Plates	630 (US32D - Satin Stainless Steel)
11. Overhead Stops	630 (US32D - Satin Stainless Steel)
12. Wall Stops and Holders	630 (US32D - Satin Stainless Steel)
13. Thresholds	628 (Mill Aluminum)
14. Weather-strip, Sweeps Drip Caps (wood and hollow metal doors)	Aluminum Anodized
15. Weather-strip, Sweeps Drip Caps (aluminum doors)	Match finish of aluminum doors.
16. Magnetic Holders	Sprayed Aluminum
17. Magnetic Locks	628 (US28)
18. Miscellaneous	626 (US26D - Satin Chromium)

2.21 KEYING

A. Acceptable manufacturers and respective catalog numbers:

	Best	No Substitutions
1.		

2.22 KEY CABINETS

A. Acceptable manufacturers and respective catalog numbers:

	Lund	Key Control	Telkee
1.	1200-1205AA	M228-2480	RWC-AWC

B. Furnish 1 each model 1200 or 1205 AA key cabinet with a capacity 1.5 times the number of key sets.

C. Provide one key cabinet with at least one hook for each key set, plus additional hooks for 50% expansion.

D. Furnish key cabinet complete with cam lock, permanent key tags, and change keycards.

E. Hardware supplier shall prepare all key change index records, tag all keys and place permanent file keys in cabinet.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to installation of hardware, installer shall examine door frame installation to insure frames have been set square and plumb. Installer shall examine doors, door frames, and adjacent wall, floor, and ceiling for conditions, which would adversely affect proper operation and function of door assemblies. Do not proceed with hardware installation until such deficiencies have been corrected.

3.2 INSTALLATION

A. Before hardware installation, general contractor/construction manager shall coordinate a hardware installation seminar with a 1 week notice to all parties involved. The seminar is to be conducted on the installation of hardware, specifically of locksets, closers, exit devices, continuous hinges and overhead stops. Manufacturer's representative of the above products to present seminar. Seminar to be held at the job site and attended by installers of hardware (including low voltage hardware) for aluminum, hollow metal and wood doors. Training to include use of installation manuals, hardware schedule, templates and physical products samples.

B. Install all hardware in accordance with the approved hardware schedule and manufacturer’s instructions for installation and adjustment.

C. Set units level, plumb and true to the line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units which are not factory prepared for anchorage fasteners. Space fasteners and anchors in accord with industry standards.

E. Drill appropriate size pilot holes for all hardware attached to wood doors and frames.

F. Shim doors as required to maintain proper operating clearance between door and frame.

G. Unless otherwise specified, locate all hardware in accordance with the recommended locations for builders’ hardware for standard doors and frames as published by the Door and Hardware Institute.

H. Use only fasteners supplied by or approved by the manufacturer for each respective item of hardware.

I. Mortise and cut to close tolerance and conceal evidence of cutting in the finished work.

J. Conceal push and pull bar fasteners where possible. Do not install through bolts through push plates.

K. Install hardware on UL labeled openings in accordance with manufacturer's requirements to maintain the label.

L. Apply self-adhesive gasketing on frame stop at head & latch side and on rabbet of frame at hinge side.

M. Install hardware in accordance with supplemental "S" label instructions on all fire rated openings.

N. Install wall stops to contact lever handles or pulls. Do not mount wall stops on casework, or equipment.

O. Where necessary, adjust doors and hardware as required to eliminate binding between strike and latchbolt. Doors should not rattle.

P. Overhead stops used in conjunction with electrified hold open closers shall be templated and installed to coincide with engagement of closer hold open position.

Q. Install door closers on corridor side of lobby doors, room side of corridor doors, and stair side of stairways.

R. Adjust spring power of door closers to the minimum force required to insure exterior and fire rated doors will consistently close and latch doors under existing conditions. Adjust all other door closers to insure opening force does not to exceed 5 lbs.

S. Adjust "sweep", "latch", and "back check" valves on all door closers to properly control door throughout the opening and closing cycle. Adjust total closing speed as required to comply with all applicable state and local building codes.

T. Install "hardware compatible" (bar stock) type weatherstripping continuously for an uninterrupted seal. Adjust templating for parallel arm door closers, exit devices, etc., as required to accommodate weatherstripping.

U. Unless otherwise specified or detailed, install thresholds with the bevel in vertical alignment with the outside door face. Notch and closely fit thresholds to frame profile. Set thresholds in full bed of sealant.

V. Compress sweep during installation as recommended by sweep manufacturer to facilitate a water resistant seal.

W. Deliver to the owner 1 complete set of installation and adjustment instructions, and tools as furnished with the hardware.

3.3 FIELD QUALITY CONTROL

A. After installation has been completed, the hardware supplier and manufacturersrepresentative for locksets, door closers, exit devices, and overhead stops shall check the project and verify compliance with installation instructions, adjustment of all hardware items, and proper application according to the approved hardware schedule. Hardware supplier shall submit a list of all hardware that has not been installed correctly.

B. After installation has been completed, the hardware supplier and manufacturer’s representative shall meet with the owner to explain the functions, uses, adjustment, and maintenance of each item of hardware. Hardware supplier shall provide the owner with a copy of all wiring diagrams. Wiring diagrams shall be opening specific and include both a riser diagram and point to point diagram showing all wiring terminations.

3.4 ADJUSTING AND CLEANING

A. At final completion, hardware shall be left clean and free from disfigurement. Make final adjustment to door closers and other items of hardware. Where hardware is found defective repair or replace or otherwise correct as directed.

B. Adjust door closers to meet opening force requirements of Uniform Federal Accessibility Standards.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of space or area, return to work during week prior to acceptance or occupancy, and make final check and adjustment of hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors.

D. Instruct Owner's personnel in proper adjustment and maintenance of door hardware and hardware finishes.

E. All hardware shall be left clean and in good operation. Hardware found to be disfigured, defective, or inoperative shall be repaired or replaced.

F. At final completion, and when H.V.A.C. equipment is in operation, installer shall make final adjustments to and verify proper operation of all door closers and other items of hardware. . Lubricate moving parts with type lubrication recommended by the manufacturer.

3.5 PROTECTION

A. Provide for proper protection of hardware items until the Owner accepts Project as complete.

END OF SECTION

SECTION 092216
NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Non-load-bearing metal framing systems for interior assemblies, including:
      a. Interior partitions.
      b. Interior suspended ceiling and soffit systems.

B. Related Sections:
   1. Section 055000 - Metal Fabrications.
   2. Section 079000 - Joint Protection.
   3. Section 092900 - Gypsum Board.

1.2 SUBMITTALS

A. Product Data: Submit required product data and documentation in accordance with Section 013300:
   1. Submit statement indicating that metal stud manufacturer has reviewed Project documents and that framing supplied conforms to specified requirements.
   2. Evaluation Reports: ICC-ES reports for metal studs and tracks, indicating compliance with specified requirements and building code in effect.

B. EQ Stud Submittals: Comply with the following if submitting EQ studs.
   1. Submit statement indicating that metal stud manufacturer has reviewed Project documents and that framing supplied conforms to specified requirements.
   2. Submit list of completed projects of similar project type and similar wall loading where specific product recommended has been used.
   3. Submit material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
   4. Evaluation Reports: ICC-ES reports for metal studs and tracks, indicating compliance with specified requirements and building code in effect.

C. Shop Drawings: Submit in accordance with Section 013300, indicating light gauge framing system. Indicate by plan and elevation, stud framing (spacing, sizes, thicknesses and types), openings, bracing and blocking, fastening and anchorage, strapping, bridging, connection details and reinforcement.

1.3 QUALITY ASSURANCE

A. Perform work in accordance with applicable reference standards unless otherwise indicated.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing metal framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C754 for conditions indicated.

1. Provide framing type, weight, grade and finish of materials in accordance with Manufacturer's recommendations, except where otherwise required by governing regulations and applicable standards.
2. Provide clips, fasteners, ties, reinforcing, flat strap and backing plates, stiffeners, shoes, tracks, hangers, brackets, anchors, accessories, and trim as recommended by Manufacturer for application indicated.
3. Steel Sheet Components: ASTM C 645, fabricated of steel meeting requirements of ASTM A1003.
4. Protective Coating (Minimum): ASTM A653, G40 hot-dip galvanized zinc coating or coating with G40 equivalent corrosion resistance.
5. Recycled Content of Steel Products: Provide products with average recycled content of steel products such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

B. Metal Studs and Runners: ASTM C645, and meeting or exceeding flexural strength, allowable bending moment, and screw pull-out of a standard 33 mil thick stud.

C. Shaft Wall Metal Studs: ASTM C645, steel C-H, C-T or I studs hot-dipped galvanized.

D. Double-Runners: ASTM C645 slip-type head joint; inside runner with 2-inch-deep flanges, and outer runner sized to friction fit inside runner.

E. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

F. Firestop Track: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

G. Furring and Bracing Members: Provide members with protective galvanized coating, in depths as indicated.
1. Hat-Shaped, Rigid Furring Channels: ASTM C645; with minimum base-metal thickness of 0.033 inch
2. Z-Shaped Furring: With slotted or nonslotted web; with minimum base-metal thickness of 0.027 inch.
3. Cold-Rolled Steel Channels: Channel bridging, furring channels, carrying channels, steel channel stiffeners and braces; with minimum base-metal thickness of 0.054 inch.
4. Resilient Furring Channels: Asymmetrical steel sheet members, with face attached to single flange by a slotted leg (web), designed to reduce sound transmission.

H. Galvanized Flat Strap and Backing Plate at Interior Stud Walls: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Metal Thicknesses:
   a. Typical: 0.054 inch.
   b. For Heavy Equipment and Grab Bar Locations: 0.068 inch.
2. Where Wood Backing and Blocking is Indicated: Refer to Section 061000 for wood requirements. Provide fire-resistant treatment.

2.3 SUSPENSION SYSTEMS

A. Components, General: Comply with ASTM C754 for conditions indicated.

B. Furring Channels: As specified above.

C. Tie Wire: ASTM A641, Class 1 zinc coating, soft temper, 0.0625 inch diameter wire, or double strand of 0.0475 inch diameter wire.

D. Hanger Attachment Anchors in Concrete: Fabricated from corrosion-resistant materials with holes or loops for attaching hanger wires and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E488 by a qualified independent testing agency.
1. Cast-in-place anchor, designed for attachment to concrete forms.
2. Postinstalled, chemical anchor.
3. Postinstalled, expansion anchor.

E. Wire Hangers: ASTM A641, Class 1 zinc coating, soft temper, 0.162 inch diameter.

F. Rod Hangers: ASTM A510, mild carbon steel; ASTM A153, hot-dip galvanized; 0.25 inch diameter.

G. Manufactured Suspension Grid System for Ceilings and Soffits: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Products and Manufacturers:
   a. Drywall Grid Systems by Armstrong World Industries, Inc.;
   b. Drywall Grid Systems by Chicago Metallic Corporation;
   c. Drywall Suspension System by USG Corporation.

2.4 AUXILIARY COMPONENTS

A. Fasteners: Galvanized steel fasteners of type, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates; and of length suitable for adequate penetration of substrate

B. Asphalt Protection Strips: Strip of 15 lb. asphalt saturated felt at intersection of partitions and masonry walls.

C. Isolation Strip: Provide one of the following:

1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

D. Acoustic Sealant: In accordance with Section 092900 - Gypsum Board.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

B. Coordination with Sprayed Fire-Resistive Materials:

1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
2. After sprayed fire-resistive materials are applied, 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 Standards: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.

3. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.
4. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 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. Install bracing at terminations in assemblies.

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

D. Installation Tolerance: Install each steel framing and furring member so fastening surfaces vary not more than 1/8 inch from plane formed by faces of adjacent framing.

3.4 FRAMING INSTALLATION

A. Framing Installation, General:

1. Partition Heights: Extend partition stud system through suspended ceilings to structural support above, except where indicated to terminate at ceiling.
   a. Provide additional bracing for partitions extending above ceiling where indicated.
   b. Continue framing around ducts penetrating partitions above ceiling.
2. Coordinate erection of studs with installation of service utilities. Align stud web openings. Coordinate installation of bucks, anchors, blocking, electrical and mechanical work which is to be placed in or behind partition framing. Allow such items to be installed after framing is complete.
3. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned joints to attain lateral support and avoid axial loading.
4. Reinforce stud partitions and provide additional metal studs as indicated and required for installation of wall cabinets, wall mounted equipment, wall mounted mechanical and electrical fixtures, accessories, shelves and shelf standards. Provide thick steel plate to span minimum of 3 studs for installation of mirrors, toilet accessories or grab bars.
5. 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.
6. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

B. Runners and Tracks: Secure runner tracks to floor and ceiling construction, and to structure above ceilings as recommended by manufacturer, with fastener spacing not to exceed 24 inches o.c.

1. Runner Tracks: Provide continuous track sized to match studs. Align runner tracks accurately to partition layout at both floor and ceiling. Provide fasteners at corners and ends of runner tracks.
2. 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.
3. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
4. 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.

C. Metal Studs: Install studs vertically at 16 inches o.c., unless otherwise indicated, and not more than 2 inches from abutting construction, each side of openings, and at corners.

1. Install metal studs in floor and ceiling runner tracks. Secure studs to runners. Anchor light gauge screw-type partition studs to runner tracks by screwing opposite flanges top and bottom, except screw end studs to both tracks at both flanges.
2. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
3. Provide additional studs at exterior corners and 2 inches from inside corners, terminations of partitions, and both sides of control joints.
4. Where partitions abut other construction, provide vertical runner track securely attached to construction.
5. Use full length studs between runner tracks.
6. Stud Splicing: Not permitted.

D. Door Openings:
   1. Frame door openings with vertical studs attached to each jamb of door frame.
   2. Provide additional studs 2 inches from jamb studs.
   3. Frame head of door with horizontal section of runner track attached to jamb studs and provide vertical studs cut to fit between head and ceiling tracks and attach to tracks.
   4. Fit runners under and above openings, secure intermediate studs at spacing of wall studs. Brace stud framing system and make rigid.

E. 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.

F. Wall Furring Installation:
   1. Erect wall furring directly attached to concrete block and concrete walls.
   2. Erect furring channels horizontally or vertically as indicated. Secure in place on alternate channel flanges at maximum 24 inches on center.
   3. Space furring channels maximum 24 inches on center, not more than 4 inches from floor and ceiling lines or abutting walls.
   4. Erect freestanding metal stud framing by means of adjustable furring brackets in accordance with manufacturer's directions.
   5. Splicing Members: Lap furring members 8 inches and runner channels 12 inches and wire-tie near each end of lap.

3.5 SHAFT WALL INSTALLATION

A. Shaft Wall Installation, General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and ASTM C 754 other than stud-spacing requirements.
   1. Anchor components to comply with ratings and performance requirements, and with governing regulations.
   2. Isolate shaft system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.
   3. Do not bridge building expansion joints with shaft wall assemblies; frame both sides of expansion joints with furring and other support.

B. Supplementary Framing: Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.

C. Penetrations: At penetrations in shaft wall, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.

D. Sprayed Fire-Resistive Materials: Coordinate gypsum board shaft system work with sprayed-on fireproofing of structure, so that both remain complete and undamaged. Patch or replace sprayed-on fireproofing removed or damaged during installation of shaft framing system.

3.6 SUSPENSION SYSTEM INSTALLATION

A. Suspended Assemblies, General: ASTM C 754.
   1. Install ceiling framing independent of walls, columns, and above ceiling work.
   2. Do not bridge building expansion joints with support system.
   3. Installation Tolerances: Install steel framing components for suspended ceilings so members for panel attachment are level to within 1/8 inch in 12 feet measured lengthwise on each member transversely between parallel members.

B. Hangers: Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

1. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
    a. Space hanger wires 48 inches o.c. along carrying channels and within 6 inches of ends of channel run. Anchor hanger wires to supporting structure. Do not attach hangers to metal deck tabs.
2. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
3. Coordinate location of hangers with other work.
    a. Do not attach hangers to steel roof deck.
    b. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
    c. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
    d. Do not connect or suspend steel framing from ducts, pipes, or conduit.

C. Carrying Channels: Position channels at proper height and level, and secure with hanger wires.
1. Space main carrying channels at maximum 48 inches on center, not more than 6 inches from perimeter walls.
2. Lap splices minimum 12 inches and secure together 2 inches from each end of splice. Provide clearance between channels and abutting walls or partitions.

D. Furring Channels: Comply with Gypsum Association GA-203.
1. Place furring channels perpendicular to carrying channels at 16 inches on center not more than 6 inches from perimeter walls.
2. Lap splices minimum 8 inches and secure together one inch from each end of splice.
3. Provide clearance between furring and abutting walls or partitions. Secure furring to carrying channels with clips.
4. Frame both sides of joints with furring and other supports.
5. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Lateral Bracing: Laterally brace entire suspension system where required. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.

3.7 GRID SUSPENSION SYSTEM INSTALLATION

A. Suspension Grid Systems: Install in accordance with Manufacturer's instructions.
1. Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces.
2. Install main beams and cross tees at the on center spacing required for ceiling loading, and location of in-ceiling services.
3. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
4. Provide additional bracing as required by code.

B. Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces.

C. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

END OF SECTION

SECTION 092900
GYPSUM BOARD

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Interior gypsum board.

B. Gypsum board shaft wall panels.

C. Tile backing panels.

1.2 DEFINITIONS

A. Gypsum Board Terminology: Refer to ASTM C11 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.3 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's recommended installation requirements for gypsum board products and accessories, including control joint placement location at walls and ceilings.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

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

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

1. Cold Weather Protection: When ambient outdoor temperatures are below 55 degrees F maintain continuous, uniform, comfortable building working temperatures of not less than 55 degrees F for minimum period of 48 hours prior to, during and following application of gypsum board and joint treatment materials or bonding of adhesives.
2. Ventilation: Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent too rapid drying.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

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

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. 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.

C. Shaft Wall Performance Requirements: Provide gypsum board shaft wall system design and tested by manufacturer to withstand lateral loading (air pressure) of 10 lbs per sq ft for maximum wall height required, and with deflection limited to 1/240.
   1. Refer to Section 092200 – Gypsum Board Supports for shaft wall studs.

D. Acoustic Rated Construction: Meet requirements of GA-600 design manual and referenced acoustic rated system.

2.2 GYPSUM BOARD, GENERAL

A. Provide gypsum board materials in accordance with recommendations of GA 216.

B. Provide gypsum board materials not containing asbestos.

C. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. American Gypsum
   2. CertainTeed Corp.
   3. Continental Building Products.
   4. G-P Gypsum Corp..
   5. National Gypsum Company.
   6. PABCO Gypsum.
   7. United States Gypsum Co..

B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
   1. Thickness: 5/8 inch.
   2. Long Edges: Tapered.

C. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
   1. Products: Subject to compliance with requirements, provide the following:
      a. CertainTeed Corp.; M2Tech Type X Gypsum Board.
      b. G-P Gypsum Corp.; ToughRock Mold-Guard Fireguard X.
      c. National Gypsum Company; Gold Bond Brand XP Fire-Shield Gypsum Board.
      d. United States Gypsum Co.; SHEETROCK Brand Mold Tough Firecode Gypsum Panel.
   2. Core: 5/8 inch, Type X.
   3. Long Edges: Tapered.
   4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

D. Abuse and Mold Resistant Gypsum Board: ASTM C 1629/C 1629M.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. CertainTeed Corp.; AirRenew Extreme Abuse Gypsum Board.
      b. National Gypsum Company; Gold Bond Brand Hi-Abuse XP Gypsum Board.
   2. Core: 5/8 inch, Type X.
   3. Surface Abrasion: Meets or exceeds Level 3 requirements.
   4. Surface Indentation: Meets or exceeds Level 1 requirements.
   5. Single-Drop Soft-Body Impact: Meets or exceeds Level 2 requirements.
   6. Long Edges: Tapered.
   7. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

E. Impact and Mold Resistant Gypsum Board: ASTM C 1629/C 1629M.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. CertainTeed Corp.: AirRenew Extreme Impact Resistant Gypsum Board.
      b. National Gypsum Company; Gold Bond Brand Hi-Impact XP Gypsum Board.
   2. Core: 5/8 inch, Type X.
   3. Surface Abrasion: Meets or exceeds Level 3 requirements.
   4. Surface Indentation: Meets or exceeds Level 1 requirements.
   5. Single-Drop Soft-Body Impact: Meets or exceeds Level 3 requirements.
   6. Hard-Body Impact: Meets or exceeds Level 3 requirements according to test in Annex A1.

7. Long Edges: Tapered.
8. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 SPECIALTY GYPSUM BOARD

A. Gypsum Shaftliner Board, Paper Faced: ASTM C 1396/C1396M; manufacturer's proprietary fire-resistive liner panels with paper surfaces.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. G-P Gypsum Corp.; ToughRock Shaftliner.
      b. National Gypsum Company; Gold Bond Brand Fire-Shield Shaftliner.
      c. United States Gypsum Company; SHEETROCK Brand Gypsum Liner Panels.

2.5 TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. CertainTeed Corp.; GlasRoc Diamondback Tile Backer.
      b. G-P Gypsum Corp.; DensShield Tile Backer Board.
      c. National Gypsum Company; eXP Tile Backer.
      d. United States Gypsum Company; Durock Glass-Mat Tile Backerboard.
   2. Core: 1/2 inch, regular type.
   3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

B. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Custom Building Products; Wonderboard.
      b. National Gypsum Company; Permabase Cement Board.
      c. United States Gypsum Co.; DUROCK Cement Board.
   2. Thickness: 1/2 inch.
   3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.
   1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
   2. Shapes:
      a. Cornerbead.
         1) Basis-of-Design: USG Sheetrock® Brand; Dur-A-Bead® Corner Bead.
      b. LC-Bead: J-shaped; exposed long flange receives joint compound.
         1) Basis-of-Design: USG Sheetrock® Brand; 200-A "J" Metal Trim.
      c. L-Bead: L-shaped; exposed long flange receives joint compound.
         1) Basis-of-Design: USG Sheetrock® Brand; 200-B "L" Metal Trim.
      d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
         1) Basis-of-Design: USG Sheetrock® Brand; 401/402 "J-Stop" Metal Trim.
      e. Expansion (control) joint.
         1) Basis-of-Design: Clark Dietrich Building Systems; #093 Zinc Control Joint.
      f. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
   1. Acceptable Manufacturers:
      a. Gordon Incorporated
      b. Fry Reglet.
   2. Profile: As shown on Drawings.
   3. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, Alloy 6063-T5.
   4. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.7 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:
   1. Interior Gypsum Board: Paper.
   2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
   3. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
   1. Prefilling: At open joints**,** rounded or beveled panel edges**,** and damaged surface areas, use setting-type taping compound.
   2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
      a. Use setting-type compound for installing paper-faced metal trim accessories.
   3. Fill Coat: For second coat, use all-purpose compound.
   4. Finish Coat: For third coat, use all-purpose compound.
   5. Skim Coat: For final coat of Level 5 finish, use setting type, sandable topping compound

D. Joint Compound for Tile Backing Panels:
   1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
   2. Cementitious Backer Units: As recommended by backer unit manufacturer.
   3. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.8 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Fasteners and Anchorages: GA 216, type and size as recommended by wallboard manufacturer.

C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
   1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
   2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Joint Treatment: USG Perf-A-Tape joint system.

E. Adhesive: USG Durabond, as recommended by wallboard manufacturer for wood framing.

F. Laminating Adhesive: Joint compound or adhesive as recommended by wallboard manufacturer for laminating gypsum board face layer to gypsum board base layer or to other continuous substrate.

G. Joint Sealant: As specified in Section 079000 - Joint Protection.

2.9 ACOUSTICAL INSULATION

A. Insulation is required to be formaldehyde-free or GreenGuard Indoor Air Quality Certified.

B. Acoustical Insulation- Fiberglass Batts: As required to meet requirements of UL Design, one of following materials: Man made vitreous fiber or resilient glass fibers bonded with thermo-setting resin. with maximum flame-spread and smoke-developed indices of 25 and 50 per ASTM E 84, respectively; passing ASTM E 136 for combustion characteristics.
   1. Thickness: Same as stud depth or as indicated.
   2. Width of Batts: As required to meet UL requirements.
   3. ASTM C665, Type 1 (Unfaced).
   4. Manufacturers and Product:
      a. Johns Manville: Formaldehyde-Free and Unfaced Sound Control Batts.
      b. Owens Corning: Fiberglas Sound Attenuation Batts.
      c. Certainteed: CertaPro AcoustaTherm Batts.
      d. Thermafiber: Sound Attenuation Fire Blankets (SAFB).

2.10 ACOUSTICAL SEALANT

A. Products: Provide one of the following unless otherwise required to meet requirements of referenced STC rating. Provide low emitting sealants meeting SCQAMD rules.

B. Acoustical Sealant for Exposed and Concealed Joints: 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. Products:
   a. Hilti Incorporated; CP 506 Acoustical Sealant.
   b. Pecora Corporation; AC-20 FTR.
   c. United States Gypsum Co.; SHEETROCK Acoustical sealant.

C. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1. Products:
   a. Ohio Sealants, Inc. Pro-Series SC-170 Rubber Base Sound Sealant.
   b. Pecora Corp. BA-98.
   c. Tremco, Inc. Tremco Acoustical Sealant.

D. Provide moldable putty type products acceptable to meet or exceed STC rating at service boxes.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. 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- wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

J. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Single-Layer Application:
   1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
   2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
      a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
      b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
   3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
   4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

B. Multilayer Application:
   1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
   2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
   3. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
   4. Fastening Methods: Fasten base layers [and face layers separately to supports with screws] [with screws; fasten face layers with adhesive and supplementary fasteners].

C. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.

D. Curved Surfaces:
   1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch- long straight sections at ends of curves and tangent to them.

2. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.

3.4 APPLYING TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile. Install with 1/4-inch gap where panels abut other construction or penetrations.

B. Cementitious Backer Units: ANSI A108.11, at locations indicated to receive tile .Water-Resistant Backing Board: Install where indicated with 1/4-inch gap where panels abut other construction or penetrations.

C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and located not over 30 feet on center, regardless if control joints are indicated on drawings or not. Prior to commencing gypsum board work, verify location of control joints with Architect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners.
2. LC-Bead: Use [at exposed panel edges].
3. L-Bead: Use [where indicated].
4. U-Bead: Use [at exposed panel edges] [where indicated].
5. Curved-Edge Cornerbead: Use at curved openings.

D. Aluminum Trim: Install in locations indicated on Drawings.

3.6 SHAFT WALL INSTALLATION

A. Anchor and fasten materials and components to comply with ratings and performance requirements, and to comply with governing regulations.

B. Coordinate gypsum board shaft system work with sprayed-on fireproofing of structure, so that both remain complete and undamaged. Patch or replace sprayed-on fireproofing removed or damaged during installation of shaft system.

C. Seal perimeter of each section of gypsum board shaft work where it abuts other work. Install second bead of acoustical sealant in location and manner which will prevent dislocation by air pressure differential between shaft and external spaces. Seal joints and penetrations in work; comply with manufacturer's instructions.

3.7 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. 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 for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile.
3. Level 3: Where indicated on Drawings
4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated .

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

5. Level 5: Where indicated on Drawings.
   a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

G. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.8 PROTECTION

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

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

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

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

END OF SECTION

SECTION 095100
ACOUSTICAL CEILING SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exposed grid suspension systems.
   2. Acoustical ceiling tiles and panels.
   3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.
   4. Perimeter trim.
   5. Related accessories.

1.2 RELATED REQUIREMENTS

A. Section 092900 - Gypsum Board

B. Division 21 – Fire Suppression

C. Division 22 – Plumbing

D. Division 23 – Heating, Ventilating, and Air-Conditioning (HVAC)

E. Division 26 – Electrical

F. Division 27 – Communications

G. Division 28 – electronic Safety and Security

1.3 REFERENCE STANDARDS (CURRENT EDITION AND REVISIONS FOR ALL)

A. ASTM International (ASTM):
   1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. National Fire Protection Association (NFPA):
   1. NFPA 101 Life Safety Code

1.4 SUBMITTALS

A. Submit in accordance with Section 013300 – Submittal Procedures, unless otherwise indicated.

B. Product Data: Manufacturer's specifications and technical data for each type of acoustical tile, suspension system, and accessory specified including:
   1. Detailed specification of construction and fabrication.
   2. Manufacturer's installation instructions.
   3. Two PDF copies of manufacturer's recommendations for care, cleaning, refinishing, maintenance and repair, including precautions against using materials and methods which maybe detrimental to finishes and acoustical performances.
   4. Product safety data sheets.

C. Certified test reports indicating compliance with performance and flammability requirements specified herein for ceiling tiles, suspension systems, and accessories.

D. Samples: Submit 2 samples of each type and pattern/color of acoustic tile and 12 inch long samples of each exposed runner and edge trim specified. If specific colors not specified, submit full standard color range offered by manufacturer. Label samples indicating manufacturer's name, supplier's name, project identification, area where materials are to be installed, and manufacturer's technical data.

1.5 QUALITY ASSURANCE

A. Installer's Qualifications:

1. Firm specializing in commercial acoustical ceiling systems installation with 3 years documented experience and certified, in writing, by the product manufacturer.
2. Firm experienced in installation of systems similar in complexity to those required for this project having successfully completed a minimum of 5 comparable scale projects using this system.
3. Furnish a written warranty against defective workmanship that may develop within one (1) year from date of installation.
4. Notify the Owner, of anticipated problems in using specified ceiling systems with substrates supplied under other sections.

B. Product/Material Qualifications:

1. Provide each type of ceiling system as produced by a single manufacturer, or using components approved by the ceiling tile manufacturer.
2. Each type and color of acoustic tile and grid shall be from the same dye lot.
3. Burning Characteristics: The manufacturer shall certify, in writing, at the time of shipment, that the materials furnished meet the published flammability and smoke development ratings of those products.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to job site in manufacturer's original, undamaged, unopened containers with identification labels indicating manufacturer's names, brands, colors, patterns, and quality designations, legible and intact.

B. Store and protect accepted materials indoors in accordance with manufacturer's directions and recommendations in a location approved by Owner. Handle tiles carefully to avoid chipping edges or damaging in any way.

1.7 JOB CONDITIONS

A. Examine areas and conditions under which ceiling systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Maintain a constant temperature and humidity level as recommended by manufacturer and at values near those indicated for final occupancy in areas where ceiling systems will be installed. Areas must be enclosed and weatherproof.

C. Do not commence with ceiling system installation until wet work in space is completed and nominally dry, dust generating activities have been completed, and work above ceilings is completed, tested, and approved.

D. Temporary minimal lighting is provided by the electrical contractor. Ceiling contractor to provide additional portable lighting, as required to perform the work of this Section.

E. Provide adequate and continuous ventilation during and after installation of adhesive-applied ceiling systems. If available, the existing building exhaust system may be used, if approved by the Owner's Representative. The ceiling contractor must coordinate with the mechanical contractor if temporary ducts, fans, filters, etc. are required so costs are included.

1.8 EXTRA STOCK

A. Provide 5% of area in full tiles, if any, of "extra" materials required per project for maintenance purposes.

1. Provide extra stock from same production run as material installed on project.
2. Package with protective covering, and label extra stock with manufacturer's name, pattern, color, project name and date.
3. Deliver to storage as directed by Owner.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Subject to compliance with requirements, provide products of one of the following manufacturers:
   1. Suspension Systems:
      a. Armstrong.
      b. Chicago Metallic Corporation.
      c. USG Interiors, Inc.
   2. Acoustical Ceiling Tiles:
      a. Armstrong.
      b. Celotex.
      c. USG Interiors, Inc.

2.2 MATERIALS: PHYSICAL CHARACTERISTICS

A. Flammability: All suspension systems and acoustical ceiling tiles shall comply with the Fire Resistive Standards for Fire Protection as outlined in the Minnesota State Building Code, the NFPA Life Safety Code ASTM E 84, and all other applicable codes, as they relate to this specific project. Provide protection materials for lighting fixtures and air ducts as required.

B. Suspension Systems:
   1. Compatible with acoustical ceiling tile.
   2. Heavy-duty unless otherwise directed by tile manufacturer.
   3. Upward access system where possible.
   4. Color to match acoustical ceiling tile, unless otherwise directed by Owner.
   5. 9/16 inch or 15/16 inch exposed

C. Acoustical Ceiling Tiles:
   1. Composition: Mineral Fiber.
   2. Surface finish: Factory-applied vinyl latex paint, unless otherwise directed by Owner.
   3. Color: White, unless otherwise directed by Owner.
   4. NRC Range: .50 - .80.
   5. STC Range: 35-45.
   6. Size: 12 inches x 12 inches, 24 inches x 24 inches, 24 inches x 48 inches.
      a. Refer to Drawings for sizes and locations.
   7. Thickness: 3/4 inch unless otherwise directed by Owner.
   8. Edge Detail: Square
      a. Refer to Drawings for types.

2.3 ACOUSTICAL TILE CEILINGS STANDARDS

A. The following is to be used as a guideline to identify ceiling systems used. See project specific construction documents for actual product selections.
   1. Acoustical Tiles: 12 inches x 12 inches square edges, white, adhesive applied: USG Millennia® CLIMAPLUS™ #70003.
      a. Location: Exam rooms, lobbies.
   2. Acoustical Tiles: 24 inches x 24 inches, tegular or beveled edges, white, 15/16 inch exposed tee system.
      a. Location: Corridors, Offices, Administrative areas, Public Spaces.
   3. Acoustical Tiles: 24 inches x 48 inches, square edges, flush lay-in, 15/16 inch exposed tee system, white.
      a. Location: Storage Areas

2.4 ACCESSORIES

A. Suspended Ceiling Suspension: Provide all anchorage accessories, fasteners, and hangers from structure above to adequately support the ceiling system as well as all integral mechanical and electrical components. Frame around fixtures and provide additional hangers as necessary to provide adequate support of fixture without visible distortion of ceiling nor deflections exceeding 1/360 or normal space of metal grid members.

B. Hanger Wire: Minimum 12 gauge galvanized, soft annealed, mild steel wire. Use heavier wire if necessitated by loading conditions.

C. Carrying Channels: 1-1/2 inch, 16 gauge cold-rolled channels painted with rust inhibitive paint.

D. Furring Channels: Hat-shaped, 7/8 inch, 25 gauge cold-rolled, electro-galvanized steel.

E. Edge Moldings and Trim: Same manufacturer as suspension system manufacturer, metal or extruded plastic of types and profiles indicated on construction documents. If not indicated, provide manufacturer's standard molding for edges and penetrations of ceiling which fits with type of edge detail and suspension system indicated.
   1. For lay in panels with reveal edge details, provide stepped edge molding which forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
   2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

F. Concrete Inserts: Inserts formed from hot-dipped galvanized sheet steel and designed for attachment to concrete forms and for embedment in concrete, with holes or loops for attachment at hanger wires.

G. Tile Fasteners: Cadmium plated, type recommended by tile manufacturer, but for not less than 1/2 inch penetration of substrate.

H. Adhesive: As recommended by acoustical product manufacturer for each substrate.

I. Miscellaneous Accessories: As recommended by manufacturers of suspension system and acoustical ceiling tile; and selected by installer to meet project circumstance and requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Installer must examine areas and conditions under which work is to be performed and notify Owner of conditions detrimental to proper or timely completion of work. Do not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the installer, or unless permission has been given by the Owner. Verify that layout of hangers will not interfere with other work and that equipment installed above ceiling will not conflict with ceiling installation or access. Beginning of installation indicates acceptance of substrate and site conditions.

3.2 PREPARATION

A. Remove existing acoustical ceiling tiles, suspension system, adhesive, or any other existing ceiling finish, if required, for installation of new acoustical tile ceiling. Caution must be used in demolition as salvage may be reused on job or moved to Owner's stock as indicated on plans or as directed by Owner's Representative.

B. Coordinate layout and installation of acoustical ceiling tiles and suspension system components with other work supported by or penetrating through ceilings, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).

C. Furnish layouts for inserts, clips, or other supports, required to be installed by other trades, for support of acoustical ceilings.

D. Do not begin installation until after major above-ceiling work is completed, tested and approved.

3.3 INSTALLATION - GENERAL

A. Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire-resistance rating requirements as indicated, and industry standards applicable to work.

B. Lay out in such manner that margins on opposite sides of rooms are equal or greater than 1/2 tile in width, with balanced borders on opposite sides.

C. Cooperate with mechanical and electrical contractors in locating and spacing fixtures, diffusers and similar items located in ceiling.

D. Provide metal closures at junctions with other materials. Cut and fit units neatly at all permanent protrusions. Seal joints at electrical outlets, ducts, pipes or other obstructions.

E. Intermix tile from four or more cartons to obtain uniform distribution of fissure variations.

F. Install acoustical materials having a directional pattern with the pattern in a single direction as directed by the manufacturer.

G. Where acoustical ceilings of different heights abut, install acoustical ceiling material to match ceiling vertically at ceiling break, unless otherwise indicated in project documents.

H. At cut ceiling panels, provide edge shape, or paint to match standard edge condition of panels unless otherwise indicated in project documents.

3.4 INSTALLATION - CEILING SUSPENSION SYSTEMS

A. Install in accordance with suspension system manufacturer's latest printed instructions.

B. Install suspension system level, true to plane, at indicated elevations and with finished surfaces free from soiling and damage.

C. Suspend main runners of suspension systems with hanger wire. Securely attach hanger wires to structure above, hanging vertically without kinks or bends. Space hangers along main runners, according to manufacturer's recommendations, reinforcing system to adequately support acoustical material, light fixtures and grilles, registers, and other equipment supported by system with maximum allowable deflection of 1/360 of span and maximum surface deviation of 1/8 inch in 12 feet. Maximum hanger spacing 4 feet on center and not less than 6 inches from each end of runner.

D. Do not support suspension system from electrical conduit or mechanical ducts, pipes or equipment. Where spans exceed recommended or specified spans, furnish larger main runner channels or additional reinforcing members, hangers, stiffening or bracing to support loads without exceeding specified allowable deflection. No swing hangers will be permitted.

E. Hanger Wires:

1. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension system.
2. Where ductwork or other interferences make it impossible to provide direct-to-structure suspension within the maximum allowable spacing, provide trapeze suspension system to maintain hanger wire spacing.
3. Provide additional hanger wires as required if ceiling fixtures are supported from main runners and the fixtures cause total dead load to exceed the deflection capability of the ceiling suspension system.

F. Exposed Suspension System:

1. Space main tees in arrangement indicated on reflected ceiling plan. Tees shall be accurately level and tied to hanger wires.
2. Install cross tees in arrangement indicated on approved reflected ceiling plan, and lock in place on main tees.
3. Install prefinished metal moldings and preformed corners at area perimeters.
4. Provide factory finished edge moldings, in longest practical lengths, where unfinished edges are exposed in the finished work.
5. Screw attach moldings to substrate at intervals not over 16 inches on center and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12'-0". Join corners accurately and connect securely.
6. Install cross tees to provide framing at entire perimeter of openings, such as at light fixtures, diffusers and grilles.

3.5 INSTALLATION – LAY IN

A. Install lay-in acoustical ceiling tiles level, in uniform plane and free from twist, warp and dents.

3.6 ADJUST AND CLEAN-UP

A. Remove and reinstall improperly installed materials.

B. 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 which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

C. Remove and dispose of debris and leave areas neat and clean.

END OF SECTION

SECTION 096500
RESILIENT FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vinyl composition tile flooring.
2. Vinyl tile flooring.
3. Sheet vinyl flooring.
4. Linoleum sheet flooring.
5. Linoleum floor tile.
6. Conductive sheet vinyl flooring with integral coved vinyl base.
7. Resilient flooring accessories.
8. Cleaning and waxing of resilient flooring.
9. Transition Edge Strips

B. Related Sections:

1. Section 033000 - Cast-in-Place Concrete: Finish floor slab and moisture treatment.

1.2 SUBMITTALS

A. Shop Drawings: Submit layout drawings on sheet flooring showing seam locations, pattern direction, and type of edge treatment used in accordance with Section 013300.

B. Slab Moisture Content and Calcium Chloride Test Results: Submit to Architect.

C. Samples: Submit samples of tile and sheet flooring in accordance with Section 013300.

D. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices for each type of resilient flooring.

1.3 QUALITY ASSURANCE

A. Provide each type of resilient flooring produced by single manufacturer, single run.

B. Applicator Qualifications: Installation of resilient flooring shall be by manufacturer's approved applicator.

C. Conductive Sheet Flooring: Representative of flooring manufacturer shall be at site during sheet flooring installation.

D. Job Mock-Up: Make sample installation of vinyl base on project surfaces as directed by Architect. Obtain acceptance of sample field installation and accomplish work to equal or exceed standard established by accepted sample.

1.4 PRODUCT HANDLING

A. Deliver resilient flooring materials in manufacturer's protective packaging. Store and handle flooring with care to prevent damage.

1.5 PROJECT CONDITIONS

A. Maintain temperature in areas of installation as recommended by resilient flooring manufacturer.

1.6 EXTRA MATERIAL

A. Replacement Materials:

1. For tile products: Deliver not less than one percent or minimum of one box, whichever is greater, of total project quantity of each type, size and color of material to Owner for replacement materials.
2. For sheet products: Deliver not less than 12” width of one full roll. Quantity should be sufficient to patch a 12” x 12” area.

B. Clearly identify each container as replacement materials.

PART 2 PRODUCTS

2.1 FLOOR COVERING MATERIALS

A. Slip Resistance of Flooring Materials: Provide materials with 0.6 coefficient of friction or greater when tested in accordance with ASTM 2047.

B. Vinyl Composition Tile: ASTM F1066, Class as indicated by product selected.
   1. See Drawings for type, color and pattern.

C. Vinyl Tile: ASTM F1700, Class as indicated by product selected.
   1. See Drawings for type, color and pattern.

D. Rubber Tile Flooring: ASTM F1344, Class as indicated by product selected.
   1. See Drawings for type, color and pattern.

E. Linoleum Floor Tile: Marmoleum Dual Tile by Forbo 2.5 mm thick ASTM F2196.
   1. Forbo Adhesive T940 and LT950 [heat welded] [flash coved].
   2. See Drawings for type, color and pattern.
   3. See Drawings for size.

F. Sheet Vinyl Flooring: ASTM F1913, Type as indicated by product selected.
   1. See Drawings for type, color and pattern.

G. Sheet Rubber Flooring: ASTM F1860, Type as indicated by product selected.
   1. See Drawings for type, color and pattern.

H. Resilient Linoleum Sheet Flooring: ASTM F2034.
   1. See Drawings for type, color and pattern.

I. Conductive Sheet Vinyl Flooring: Homogeneous, non-layered, non-laminated polyvinyl chloride with welding rods in matching or contrasting colors as selected. Provide with integral flash cove base.
   1. See Drawings for type, color and pattern.

J. Anti Static Sheet Vinyl Flooring: Welding rods in matching or contrasting colors as selected.
   1. See Drawings for type, color and pattern.

K. Colors and Patterns: Provide tile units with uniformly distributed color and pattern throughout thickness of tile.

2.2 RESILIENT FLOORING ACCESSORIES

A. Vinyl Base: ASTM F1861, Type as indicated by product selected, 4 inch height, 1/8 inch thickness, 120 foot coil lengths. Provide standard top-set cove base, except provide straight base at carpet.
   1. See Drawings for type, color and pattern.

B. Resilient Stair Treads: ASTM F2169, Type as indicated by product selected, full depth of stair tread.
   1. Color, and nosing style and height: See Drawings

C. Resilient Stair Nosing: Ribbed rubber (vinyl) square nose, 3/16 inch with 1-1/4 inch vertical face and 1-1/2 inch horizontal face, color : See Drawings

D. Resilient Risers: Provide single-piece resilient riser to match stair tread for height and width of stair risers.

E. Transition Edge Strips: Vinyl reducer strips in thickness to match adjacent resilient flooring material. Provide at edges of resilient flooring wherever edge is exposed.
   1. Color: See Drawings for type, color and pattern.

F. Sheet Cove Cap or Zero Edge Reducing Strip and Fillet Strip: Plastic cap or reducing strip and fillet strip as recommended by manufacturer for integral or flash cove base.

2.3 FILLERS/ADHESIVES/SEALERS

A. Sub-Floor Filler: White premix latex, mix with water to produce cementitious paste.

B. Primers and Adhesives: Water-resistant stabilized type as recommended by resilient flooring manufacturer for specific material.

C. Flooring Adhesives: Adhesive recommended and approved by flooring manufacturer, zero VOC, tested by the adhesive manufacturer for use with the specified flooring product; Submit approval documentation by both flooring manufacturer and adhesive manufacturer as compatible with substrate, flooring, project conditions, use, expected traffic, equipment loads and surface conditions including alkalinity, moisture emission levels, slab relative humidity, and other factors that may affect flooring and adhesive performance.

D. Adhesive and Sealant VOC Limits: According to South Coast Air Quality Management District Rule 1168 and GS-36 for aerosols. VOC Limits: As tested using U.S. EPA Reference Test Method 24 and as defined by South Coast Air Quality Management District Rules: SCAQMD Rule 1168, Adhesive and Sealant Applications

E. Polish: Type recommended by resilient flooring material manufacturer for material type and location.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which resilient flooring is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 SITE AND SUBSTRATE CONDITIONS

A. Ensure floor surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet.

B. Ensure concrete floors are dry and meet moisture conditions required by flooring and adhesive manufacturer's and exhibit negative alkalinity, carbonization or dusting. Also ensure substrate meets requirements of adhesive and flooring manufacturer's requirements. Remove curing agents and other surface residue that may negatively affect adhesion or flooring installation and performance.

C. Floor Substrate Criteria:

1. Moisture vapor emissions do not exceed 75 percent RH when tested in accordance with ASTM F2170 unless otherwise required by finished flooring and adhesive manufacturer.
2. Moisture in concrete slab conditions up to 3lb. per 1,000 sq. ft. per 24 hours when tested with a prepackaged calcium chloride crystal kit performed in accordance with ASTM F1869 unless otherwise required by finished flooring and adhesive manufacturer.
3. Concrete slab alkalinity conditions up to a pH of 6-9 when tested in accordance with ASTM F710 with in-situ monitoring, unless otherwise required by finished flooring and adhesive manufacturer.
4. Maintain testing records and submit along with warranties for Project Record Documents.

D. Maintain minimum 70 degrees F air temperature at flooring installation area for 3 days prior to, during, and for 24 hours after installation.

E. Store flooring materials in area of application. Allow 3 days for material to reach equal temperature as area.

3.3 LEVELING

A. Preparation: Prepare substrate surfaces to receive resilient flooring as recommended by adhesive manufacturer and resilient flooring manufacturer.

1. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with subfloor filler.
2. Clean floor and apply, trowel and float filler to leave smooth, flat hard surface. Prohibit traffic until filler is cured.

3.4 INSTALLATION - FLOORING

A. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged. Lay tile with grain in tile running in same direction, unless otherwise shown.

B. Clean substrate. Spread adhesive evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation. Spread only enough adhesive to permit installation of flooring before initial set.

C. Set flooring in place; press with heavy roller to ensure full adhesion. Tightly adhere flooring to substrate without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections.

D. Lay flooring with joints and seams parallel to building lines to produce minimum number of seams and symmetrical tile pattern as indicated.

E. Lay tile from center marks established with principal walls, discounting minor offsets, so tile at opposite edges of room are of equal width. Install with minimum tile width 1/2 full size at room or area perimeter, to square grid pattern with joints aligned unless otherwise indicated.

F. Install sheet flooring to minimum of 1/3 full material width and with sheet parallel to length of room unless otherwise indicated. Lay sheet flooring to provide as few seams as possible. Double cut sheet and continuously heat seal or heat weld seams in vinyl sheet flooring to provide seamless installation. Match seam edges for color shading and pattern.

G. Install conductive sheet flooring in accordance with manufacturer's recommendations. Construct monolithic seamless floor by routing joints and interior welding and fusion of vinyl welding rods to each tile at joints. Authorized installers shall use only those procedures and materials as recommended and approved by flooring manufacturer.

H. Terminate resilient flooring at centerline of door openings where adjacent floor finish is dissimilar.

I. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints. Cut flooring neatly to and around fixtures.

J. Install flooring wall to wall. Install under mobile or modular cabinets, and other items to produce wall to wall floor in all rooms.

K. Butt flooring tightly to vertical surfaces, thresholds, nosings and edgings. Scribe around obstructions and to produce joints, laid tight, even, and straight. Extend flooring into toe spaces, door reveals, and into closets and similar openings.

L. Install flooring on covers for telephone and electrical ducts, in pan type floor access covers, and other such items as occur within finished floor areas. Maintain overall continuity of color and pattern with pieces installed in these covers.

M. Continue flooring through areas to receive moveable type partitions without interrupting floor pattern.

N. Install feature strips and floor markings where indicated. Fit joints tightly.

3.5 INSTALLATION - ACCESSORIES

A. Apply wall base to walls, columns, pilasters, cabinetwork and other permanent fixtures in rooms or areas where base is required. Coped inside corners; install preformed outside corners. Tightly bond base to backing and fit joints tight and vertical.

B. Install base on solid backing. Adhere tightly to wall and floor surfaces throughout length of each piece, with continuous contact at horizontal and vertical surfaces. Scribe and fit to door frames and other obstructions.

C. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edge strips at unprotected edges of flooring and at door jambs between rooms with different color or pattern of flooring.

D. Install edging strips where carpet terminates at other floor coverings except where another device, such as expansion joint cover system or threshold is indicated with integral binder bar. Use full length pieces only. Butt tight to vertical surfaces. Where splicing cannot be avoided, butt ends tight and flush.

E. Install stair nosings, treads and risers in accordance with manufacturer's printed instructions, in one piece for full width of tread.

F. Adhere accessories over each entire surface and fit accurately and securely.

G. At conductive sheet vinyl flooring install plastic fillet strip and flash cove base up wall 4 inch and terminate integral base with cove cap or zero edge reducing strip.

3.6 PROTECTION

A. Prohibit traffic from floor finish for 48 hours after installation. Protect flooring from damage by use of protective covering.

3.7 CLEAN-UP

A. Remove excess adhesive or other surface blemishes from floor, base and wall surfaces without damage, and as recommended by flooring manufacturer.

3.8 FINISHING

A. After completion of project and just prior to final inspection of work, thoroughly clean floors and accessories. Apply sealer, wax and buff, with type of sealer, wax, number of coats and buffing procedures as recommended by flooring manufacturer for new flooring installation. Seal and wax floor and base surfaces in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 096813
TILE CARPETING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Carpet tiles, adhesive and accessories.

B. Related Sections:

1. Section 087100 – Door Hardware: Thresholds for door openings.
2. Section 096500 - Resilient Flooring.
3. Section 096800 - Carpeting.

1.2 SUBMITTALS

A. Product data for each type of carpet tile material and installation accessory specified. Submit manufacturer's printed data on physical characteristics, durability, fade resistance, and fire-test-response characteristics. Submit method of installation of each type of substrate.

B. Shop drawings showing columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tile.

C. Samples in manufacturer's standard sizes, showing full range of color, texture, and pattern variations expected. Prepare samples from same material to be used for work. Label each sample with manufacturer's name, material type, color, pattern, and designation indicated on Drawings and carpet tile schedule.

1. Full-size sample of each type of carpet tile required.
2. 12-inch samples of each type of exposed edge stripping and accessory item.

D. Maintenance data for carpet tile to include in operation and maintenance manual. Include following:

1. Methods for maintaining carpet tile, including manufacturer's recommended frequency for maintaining carpet tile.
2. Precautions for cleaning materials and methods that could be detrimental to finishes and performances. Including cleaning and stain-removal products and procedures.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Engage experienced Installer who is certified by Floor Covering Installation Board (FCIB) or who can demonstrate compliance with FCIB certification program requirements.

B. Single-Source Responsibility: Obtain each type of carpet tile from one source and by single manufacturer.

C. Fire-Test-Response Characteristics: Provide carpet tiles with following fire-test-response characteristics as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify carpet tile with appropriate markings of applicable testing and inspecting agency.

1. Surface Flammability: Passes CPSC 16 CFR, Part 1630.
2. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E648.
3. Flame Spread: 25 or less per ASTM E84.
4. Smoke Developed: 450 or less per ASTM E84.

1.4 DELIVERY, STORAGE AND HANDLING

A. Comply with the Carpet and Rug Institute's CRI Carpet Installation Standard, Section 5: "Storage and Handling."

B. Deliver materials to Project site in original wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.

C. Store materials on-site in original undamaged packages, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, with continuous blocking off ground.

1.5 PROJECT CONDITIONS

A. Comply with CRI Carpet Installation Standard, Section 7: “Site Conditions.”

B. Space Enclosures and Environmental Limitations: Do not install carpet tile until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.

C. Subfloor Moisture Conditions: Moisture emission rate of not more than 3 lb/1000 sq. ft/24 hours when tested by calcium chloride moisture test in compliance with CRI Carpet Installation Standard, 9.3, with subfloor temperature not less than 55 degrees F.

D. Subfloor Alkalinity Conditions: Testing the pH at the surface of a concrete slab must be conducted in accordance with ASTM F 710-05, not to exceed 9 pH.

1. The test site or building must be at the same temperature and humidity expected during normal use. These conditions are required to be maintained 48 hrs prior to, and during testing.

1.6 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.

1. Carpet Tile: Before installation begins, furnish quantity of full-size units equal to 5 percent of amount installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Interface

2.2 CARPET TILE

A. Carpet Tile:

1. Manufacturer and other information, including color:
   a. See Drawings for color, size, pattern and installation pattern.

B. Walk off Carpet Tile:

1. Manufacturer and other information, including color:
   a. See Drawings for color, size, pattern and installation pattern.

2.3 ACCESSORIES

A. Concrete-Slab Primer: Non-staining type as recommended by carpet tile manufacturer.

B. Trowelable Underlayments and Patching Compounds: As recommended by carpet tile manufacturer.

C. Adhesive: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated and to comply with flammability requirements for installed carpet tile as recommended by carpet tile manufacturer.

D. Transition Edge Strips: See Drawings for information.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine subfloors and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting performance of carpet tile. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Verify that subfloors and conditions are satisfactory for carpet tile installation and comply with requirements specified in this Section and those of carpet tile manufacturer.

3.2 PREPARATION

A. Comply with carpet tile manufacturer's installation recommendations to prepare substrates indicated to receive carpet tile installation.

B. Level subfloor within 1/4 inch in 10 feet noncumulative, in all directions. Sand or grind protrusions, bumps, and ridges. Patch and repair cracks and rough areas. Fill depressions.

1. Use leveling and patching compounds to fill cracks, holes, and depressions in subfloor as recommended by carpet tile manufacturer.

C. Remove subfloor coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone.

D. Broom or vacuum clean subfloors to be covered with carpet tile. Following cleaning, examine subfloors for moisture, alkaline salts, carbonation, or dust.

E. Concrete-Subfloor Preparation: Apply concrete-slab primer, according to manufacturer's directions, where recommended by carpet tile manufacturer.

3.3 INSTALLATION

A. Comply with CRI Carpet Installation Standard, Section 18: "Modular Carpet."

B. Where demountable partitions or other items are indicated for installation on top of finished carpet tile floor, install carpet tile before installation of these items.

C. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.

1. Provide cut-outs as required for removable access devices in substrate; and provide inserts for covers.

D. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstruction, removable flanges, alcoves, and similar openings.

E. Install borders parallel to walls.

3.4 CLEANING

A. Perform following operations immediately after completing installation:

1. Remove visible adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove protruding yarns from carpet tile surface.
3. Vacuum carpet tile using commercial machine with face-beater element.

3.5 PROTECTION

A. Comply with CRI Carpet Installation Standard, Section 20: "Protecting Indoor Installations."

B. Provide final protection and maintain conditions, in manner acceptable to manufacturer and Installer, that ensure carpet tile is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 097200
WALL COVERINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Vinyl wall covering.
      a. No vinyl wallcovering on exterior walls.

B. Related Sections:
   1. Section 092900 - Gypsum Board: Substrate prep.
   2. Section 099000 - Painting: Substrate prep and priming of surfaces to receive wall covering.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include data on physical characteristics, durability, fade resistance, and flame-resistance characteristics.

B. Shop Drawings: Show location and extent of each wall-covering type.
   1. Indicate pattern placement, seams and termination points.
   2. Indicate veneer matching, seams and termination points.

C. Samples: For each type of wall covering and for each color, pattern, texture, and finish specified, full width by 36-inches long.
   1. Wall-Covering Sample: From same production run to be used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of fabric.
   2. Wood-Veneer Wall-Covering Sample: From same flitch to be used for the Work, with specified finish applied.

D. Product Schedule: For wall coverings.[Use same designations indicated on Drawings.]

E. Qualification Data: For qualified testing agency.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for wall covering.

G. Maintenance Data: For wall coverings to include in maintenance manuals.

1.3 QUALITY ASSURANCE

A. Installer's Qualifications: Firm with not less than 5 years experiences in installation of systems similar in complexity to those required for this Project, including specific requirements indicated.
   1. Acceptable to or licensed by manufacturer.
   2. Successfully completed not less than 5 comparable scale projects using this system.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: Deliver products in original unopened packaging with legible manufacturer's identification.

B. Storage and Protection: Comply with manufacturer's recommendations.
   1. Store in a cool, dry place out of direct sunlight.
   2. Protect from damage by the elements and construction procedures.
   3. Store at temperature above 40 degrees F.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Lighting: Do not install wall covering until a permanent level of lighting is provided on the surfaces to receive wall covering.

C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.

1.6 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Wall-Covering Materials: For each type, full-size units equal to 5 percent of amount installed.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Low-Emitting Materials: Wall-covering system shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Surface-Burning Characteristics: As follows, per ASTM E 84:
      a. Flame-Spread Index: 25 or less.
      b. Smoke-Developed Index: 450 or less.
   2. Fire-Growth Contribution: Textile wall coverings tested according to NFPA 265 and complying with Method A test protocol in IBC 2000, Section 803.5.1.

2.2 VINYL WALL COVERING

A. Vinyl Wall Covering, General: For each wall covering type, provide mildew-resistant wall covering in rolls from the same production run or dye lot. Refer to Material Identification List for product Manufacturer, Color and Pattern.

B. Vinyl Wall Covering, General: For each wall covering type, provide mildew-resistant wall covering in rolls from the same production run or dye lot; and complying with the following:
   1. FS CCC-W-408D and CFFA-W-101-D for Type III, Heavy -Duty products.
   2. ASTM F 793 Category V, Type II, Commercial Serviceability or Category VI, Type III, Commercial Serviceability
   3. Composition:
      a. Backing: Scrim fabric, consisting of Polyester cellulose fibers.
      b. Total Weight: As indicated on Drawings
      c. Width: 54 inches.
      d. Repeat: As indicated on Drawings
   4. Colors, Textures, and Patterns: As indicated on Drawings or to match Existing

2.3 ACCESSORIES

A. Adhesive: Mildew-resistant, non-staining**,** strippable adhesive, for use with specific wall covering and substrate application indicated and as recommended in writing by wall-covering manufacturer.
   1. Adhesive shall have a VOC content of 50 g/L or less.
   2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Primer/Sealer: Mildew resistant, complying with requirements in Section 099000 - Painting and recommended in writing by primer/sealer and wall-covering manufacturers for intended substrate.

C. Wall Liner: Nonwoven, synthetic underlayment and adhesive as recommended in writing by wall-covering manufacturer.

1. Adhesive shall have a VOC content of 50 g/L or less.
2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Seam Tape: As recommended in writing by wall-covering manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for levelness, wall plumbness, maximum moisture content, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Schedule installation of wall covering at appropriate time during progress of work to prevent damage during construction and movement of materials.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, mildew, and incompatible primers.

C. Fill seams, joints, nicks, gouges and other minor imperfections of substrate wall surfaces with latex block filler. Sand smooth flush with surface.
   1. Follow with prime coat of sealer recommended by wall covering manufacturer.

D. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
   1. Moisture Content: Maximum of 5 percent on new plaster, concrete, and concrete masonry units when tested with an electronic moisture meter.
   2. Plaster: Allow new plaster to cure. Neutralize areas of high alkalinity. Prime with primer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
   3. Metals: If not factory primed, clean and apply metal as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
   4. Gypsum Board Substrate:
      a. Tape and sand gypsum board assemblies in accordance with Section 092900 – Gypsum Board to achieve smooth and flat substrate for cork wall covering.
      b. Prime gypsum board surfaces receiving wall covering as recommended by manufacturer.
   5. Painted Surfaces: Treat areas susceptible to pigment bleeding.

E. Check painted surfaces for pigment bleeding. Sand gloss, semigloss, and eggshell finish with fine sandpaper.

F. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

G. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

H. Install wall liner, with no gaps or overlaps, where required by wall-covering manufacturer. Form smooth wrinkle-free surface for finished installation. Do not begin wall-covering installation until wall liner has dried.

3.3 WALL-COVERING INSTALLATION

A. General: Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated except where more stringent requirements apply.

B. Cut wall-covering strips in roll number sequence. Change roll numbers at partition breaks and corners.

C. Install strips in same order as cut from roll.
   1. For solid-color, even-texture, or random-match wall coverings, reverse every other strip.

D. Install wall covering with no gaps or overlaps, no lifted or curling edges, and no visible shrinkage.

E. Install seams vertical and plumb at least 6 inches from outside corners and 6 inches from inside corners unless a change of pattern or color exists at corner. No horizontal seams are permitted.

F. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.

G. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without any overlay or spacing between strips.

3.4 CLEANING

A. Remove excess adhesive at finished seams, perimeter edges, and adjacent surfaces.

B. Use cleaning methods recommended in writing by wall-covering manufacturer.

C. Replace strips that cannot be cleaned.

D. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

END OF SECTION

SECTION 099000
PAINTING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Painting and finishing of new materials.
   2. Preparation of surfaces for painting and finishing.
   3. Repainting and refinishing of existing surfaces as indicated and as specified in Section 017329 - Cutting and Patching.
      a. Preparation of existing surfaces for repainting and refinishing.
   4. Smoke and fire partitions stenciling, and pipe painting.

B. Related Sections:
   1. Section 092900 - Gypsum Board: Spray texture ceiling finish.
   2. Section 097200 - Wall Coverings: Primer/sealer on surfaces to receive wall covering.
   3. Section 099600 – High Performance Coatings.

1.2 SUBMITTALS

A. Product Data: For each paint system specified. Include block fillers and primers.
   1. Material List: Provide inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer’s catalog number and general classification.
   2. Manufacturer’s Information: Provide manufacturer’s technical information, including label analysis and instructions for handling, storing and applying each coating material proposed for use.
   3. Certification by manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

B. Samples: Submit paint and transparent finish samples in accordance with Section 013300, for color selection and finish acceptance.
   1. Paint Colors, Surface Treatments and Finishes: As selected by Architect. Submit three 8 inch by 10 inch samples to be reviewed for color and sheen. Architect reserves right to select color or finish from any manufacturer, herein specified, as necessary to achieve desired color or finish.

C. Schedule: For acceptance, submit 3 copies of complete schedule showing each product by number and brand name proposed to be used at each surface and location. Generally follow specified outline and list number of coats.

1.3 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide primers and undercoat paint produced by same manufacturer as finish coats.

B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

C. Applicator Qualifications: Engage experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with record of successful in-service performance.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver paint materials in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, color designation and instructions for mixing or reducing.
   1. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

B. Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45 degrees F in well ventilated area. Restrict storage to paint materials and related equipment.

C. Take precautionary measures to prevent fire hazards and spontaneous combustion. Comply with health and fire regulations.

1.5 PROJECT CONDITIONS

A. Environmental Requirements: Comply with manufacturer's recommendations as to environmental conditions under which painting and finishing can be applied. Do not apply finish in areas where dust is being generated.

B. Measure moisture content of surfaces using electronic moisture meter. Do not apply finishes unless moisture contents of surfaces are below following maximums:
   1. Plaster and Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete and Concrete Block: 12 percent.
   3. Interior Wood: 15 percent.

C. Ensure surface temperature and surrounding air temperature is above 40 degrees F before applying finishes. Minimum application temperature for latex paints for interior work shall be 45 degrees F and 50 degrees F for exterior work. Minimum application temperature for transparent finish shall be 65 degrees F, or surface and air temperature shall be 5 degrees above dew point.

D. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 45 degrees F for 24 hours before, during and 48 hours after application of finishes.

E. Provide minimum 25 foot candles of lighting on surfaces to be finished.

1.6 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
   1. Quantity: Furnish Owner with extra paint materials in quantities indicated below:
      a. Interior, Paint: 1 gal. of each color applied.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Single-Source Responsibility: Provide primer, base and intermediate coats, and finishes produced by a single manufacturer for each system scheduled in Part 3.

B. National Manufacturers:
   1. Sherwin-Williams
   2. Glidden Professional/Devoe Coatings
   3. Benjamin Moore
   4. PPG Paints
   5. Valspar
   6. Hirshfields
   7. Diamond Vogel

2.2 MATERIALS

A. Material Compatibility: Provide block fillers, primers, base coat, intermediate coat, and finish coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide factory-formulated paint materials of type as recommended by Manufacturer for substrate indicated.

C. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:
   1. Flat Paints and Coatings: 50 g/L.
   2. Nonflat Paints and Coatings: 150 g/L.
   3. Dry-Fog Coatings: 400 g/L.
   4. Primers, Sealers, and Undercoaters: 200 g/L.
   5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
   6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
   7. Pretreatment Wash Primers: 420 g/L.
   8. Floor Coatings: 100 g/L.
   9. Shellacs, Clear: 730 g/L.
   10. Shellacs, Pigmented: 550 g/L.

D. Painting and Finishing Schedules: Refer to Painting and Finishing Schedules in Part 3 of this Section.
   1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
   2. Sheen: When one of following terms is used to denote specific sheen for coating listed, following index shall apply:
      a. Flat: Less than 15 units based on 85 degrees of sheen.
      b. Eggshell: 5 to 20 units based on 60 degrees of sheen.
      c. Satin/Low Lustre: 15 to 35 units based on 60 degrees of sheen.
      d. Semi-gloss: 30 to 65 units based on 60 degrees of sheen.
      e. Gloss: Above 65 units based on 60 degrees of sheen.

E. Paint Colors: Provide specified color in paint type as scheduled in this Section
   1. List for color selections as indicated on Drawings

2.3 MIXING AND TINTING

A. Deliver paints ready-mixed to job site.

B. Job mixing and job tinting is not acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive paint and transparent finishes for conditions that would adversely affect execution, permanence or quality of work and which cannot be put into acceptable condition through preparatory work. Do not proceed with surface preparation or coating application until conditions are suitable.

3.2 PREPARATION OF SURFACES

A. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as specified, for each particular substrate condition.
   1. Remove mildew, by scrubbing with solution of detergent, bleach and warm water. Rinse with clean water and allow surface to dry completely.
   2. Remove surface contamination from aluminum surfaces requiring paint finish by steam, high pressure water or solvent washing. Apply etching primer or acid etch. Apply paint immediately if acid etching.
   3. Remove contamination from copper surfaces requiring paint finish by steam, high pressure water or solvent washing. Apply vinyl etch primer or acid etch. Apply paint immediately if acid etching.

4. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of anticipated problems in using specified coating systems with substrate primed by others.

B. Remove hardware, hardware accessories, plates, lighting fixtures, and similar items in-place and not to be finish painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items by workmen skilled in trades involved.

C. Clean surfaces to be painted before applying paint or surface treatment. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Program cleaning and painting so that dust and other contaminants from cleaning process will not fall in wet, newly painted surfaces.

1. Remove dirt, oil, grease and sand if necessary to provide adhesion key, when asphalt, creosote or bituminous surfaces require paint finish. Apply compatible sealer or primer.
2. Remove dirt, grease and oil from canvas and cotton insulated coverings.

D. Cementitious Materials: Prepare cementitious surfaces of concrete, concrete block and cement plaster to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint.

1. Remove contamination, acid etch and rinse new concrete floors with clear water. Ensure required acid alkali balance is achieved. Allow to thoroughly dry. Repeat procedure if necessary to achieve a medium sandpaper-like profile.
2. Remove dirt, loose mortar, scale, powder and other foreign matter from concrete and concrete block surfaces which are to be painted or to receive clear seal. Remove oil and grease with solution of trisodium phosphate, rinse well and allow to thoroughly dry.
3. Remove stains from concrete and concrete block surfaces caused by weathering of corroding metals with solution of sodium metasilicate after being thoroughly wetted with water. Allow to thoroughly dry.

E. Gypsum Wallboard: Remove contamination from gypsum wallboard surfaces and prime to show defects, if any. Paint after defects have been remedied.

F. Plaster Surfaces: Fill hairline cracks, small holes and imperfections on plaster surfaces with patching plaster. Smooth off to match adjacent surfaces. Wash and neutralize high alkali surfaces where they occur.

G. Galvanized Surfaces: Clean free of oil and surface contaminates with acceptable non-petroleum based solvent.

H. Ferrous Metals: Clean non-galvanized, ferrous surfaces that have not been shop-coated of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning, complying with Steel Structures Painting Council (SSPC)-SP3.

1. Touch-up shop-applied prime coats which have damaged or bare areas. Wire-brush, solvent-clean, and touch-up with same primer as shop coat.
2. Clean unprimed steel surfaces by washing with solvent. Apply treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime surfaces to indicate defects, if any. Paint after defects have been remedied.
3. Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather out edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. (Prime steel including shop primed steels.)

I. Wood: Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off.

1. Prime or seal wood required to be job painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood.
2. When transparent finish is required, back-prime with one coat of same material as used for surface.

3. Seal tops, bottoms and cut-outs of wood doors with coat of surface finish immediately upon delivery to job for field painted doors only.
4. Scrape and clean small, dry, seasoned knots and apply thin coat of white shellac or other recommended knot sealer, before application of priming coat.
5. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.
6. Remove dust, grit and foreign matter from exterior wood siding which is to receive paint finish. Seal knots, pitch streak and sappy sections. Fill nail holes with exterior caulking compound after prime coat has been applied.
7. Prior to finishing glue laminated beams, wash down surfaces with solvent and remove grease and dirt.

J. Existing Surfaces to be Repainted or Refinished: Wash surfaces to remove grease, oil, soil or other matter which will interfere with proper bond of new materials. Scrape and wire brush loose or flaking paint. Fill cracks, voids or other defects.

3.3 MATERIALS PREPARATION

A. Mix and prepare painting materials and transparent finish materials in accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in clean condition, free of foreign materials and residue.

C. Stir materials before application to produce mixture of uniform density, and as required during application of materials. Do not stir any film that may form on surface into material. Remove film and, if necessary, strain material before using.

3.4 APPLICATION

A. Do not apply to wet or damp surfaces.
1. Wait at least 30 days before applying to new concrete or masonry.
   a. Test concrete for moisture content to verify manufacturer’s surface moisture requirements are met.
   b. Follow manufacturer’s procedures to apply appropriate coatings prior to 30 days.
2. Wait until wood is fully dry after rain, fog or dew.
   a. Test wood for moisture content to verify manufacturer’s surface moisture requirements are met.

B. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
4. Apply each coat at proper consistency.
   a. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.
5. Each coat of paint shall be slightly darker than preceding coat unless otherwise approved by Architect.
6. Provide finish coats which are compatible with prime paints used.

C. Do not apply succeeding coats until previous coat has completely dried. Sand between each enamel or varnish coat application with fine sandpaper, or rub surfaces with pumice stone where required to produce even, smooth surface in accordance with coating manufacturer's directions.
1. Allow each coat of finish to dry before following coat is applied, unless directed otherwise by manufacturer.

D. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive film thickness equivalent to that of flat surfaces.

E. Finish doors on tops, bottoms, and side edges same as exterior faces, unless otherwise indicated.

F. Film Thickness: Apply materials in accordance to paint manufacturer's recommendations and spreading rates to provide total dry film thickness as recommended.
   1. Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated
   2. Use precision instruments designed for measuring and evaluation wet and dry films of paints and coatings.
   3. Results measuring less than recommended thickness will require additional material application.
      a. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.
   4. Use of poor hiding colors may require application of additional coats in order to achieve proper coverage and hiding.

G. Apply first-coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

H. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of undercoat.

I. Prime Coats: Recoat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure finish coat with no burn-through or other defects due to insufficient sealing.

J. Stipple Enamel Finish: Roll and redistribute paint to even and fine texture. Leave no evidence of rolling such as laps, irregularities in texture, skid marks, or other surface imperfections.

K. Transparent Finish: On exposed portions, use multiple coats to produce glass-smooth surface film continuity of even luster. Provide finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats, unless otherwise indicated.

L. Repainting of Existing Surfaces: Where repainting of existing surfaces is required, repaint wall and ceiling surfaces in their entirety, patch or spot painting is not acceptable.

M. Paint surfaces behind movable equipment or furniture same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only.

N. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.5 MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to mechanical and electrical documents with respect to field painting and finishing requirements. Painting of mechanical and electrical work is not required in pipe chases, tunnels, and mechanical rooms with unpainted walls.

B. Remove grilles, covers and access panels for mechanical and electrical systems from location and paint separately.

C. Finish paint primed equipment to color selected.

D. Prime and paint insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars and supports, except where items are plated or covered with prefinished coating, or where they are not in finished space or room.

E. Paint interior surfaces of air ducts, convector and baseboard heating cabinets that are visible through grilles and louvers before installation of equipment with 1 coat of flat black paint, to limit of sight line. Paint dampers exposed immediately behind louvers, grilles, convector and baseboard cabinets to match face panels.

F. Paint exposed piping, insulated piping and conduit occurring in finished areas. Color and texture to match adjacent surfaces.

G. Paint both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.

3.6 CLEANING

A. As work proceeds and upon completion, promptly remove paint where spilled, splashed or spattered. Touch up and restore damaged or defaced painted areas.

B. During progress of work keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris. Remove at end of each workday.

C. Upon completion of work clean window glass and other paint-spattered surfaces and leave premises neat and clean, to satisfaction of Owner.

3.7 PROTECTION

A. Adequately cover or otherwise protect finished work of other trades and other surfaces from paint and damage. Repair damage as result of inadequate or unsuitable protection as acceptable to Architect.

1. Furnish sufficient drop cloths, shields and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.

B. Place cotton waste, cloths and material which may constitute fire hazard in closed metal containers and remove daily from site.

C. Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items shall be carefully stored, cleaned and replaced on completion of work in each area. Do not use solvent to clean hardware that may remove permanent lacquer finish.

D. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

3.8 INTERIOR PAINTING AND FINISHING SCHEDULE (INTERIOR)

A. Cast-In-Place Concrete, Precast Concrete and Portland Cement Plaster (Stucco):

1. Surfaces Included: Walls, beams, columns, posts, ceilings.
2. Water-Based System: Premium Quality Acrylic Latex Finish-not less than 39 percent solids over Acrylic Primer/Sealer.
    a. Primers: S-W Loxon Concrete and Masonry Primer, A24W8300
    b. Finishes:
        1) 2 coats S-W Harmony Interior Latex Flat, B5 Series.
        2) 2 coats S-W Harmony Interior Latex Eg-Shel, B9 Series.
        3) 2 coats S-W Harmony Interior Latex Semi-Gloss, B10 Series.
3. Solventborne Epoxy System, High Moisture Areas: Solventborne Polyamide Epoxy Coating over Polymide Epoxy Primer.
    a. VOC Requirement: Not more than 100 g/L VOCs.
    b. Primer: 1 coat S-W Macropoxy 646-100, semi-gloss B58-600 Series.
    c. Finish: 1 coat S-W Macropoxy 646-100, semi-gloss B58-600 Series (non-gloss).
4. Waterborne Zero-VOC, Low-Odor System: Zero-VOC, Low-Odor Acrylic Finish over Zero-VOC, Low-Odor Acrylic Primer.
    a. VOC Requirement: Not more than 50 grams VOC’s per liter, not less than 35 percent solids, ammonia free coating.
    b. Primer: 1 coat S-W ProMar 200 Zero-VOC Interior Latex Primer, B28W2600.
    c. Finish:
        1) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Flat, B30-2600 Series.
        2) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Eg-Shel, B20-2600 Series.
        3) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Semi-Gloss, B31-2600 Series.

B. Concrete Floors:

1. Surfaces Included: Concrete floors subject to light/moderate pedestrian traffic.
2. Solventborne System: Chemical-Resistant Solventborne Polyamide Epoxy Coating.
    a. VOC Requirement: Not more than 100 g/L VOCs.
    b. Primer: 1 coat S-W Macropoxy 646-100, B58-600 Series.
    c. Finish: 1 coat S-W Macropoxy 646-100, B58-600 Series with Sharkgrip Slip Reistant Additive.
3. Solventborne Slip-Resistant System: Polyamide Epoxy Slip Resistant Epoxy Coating over Bonding Primer.
    a. VOC Requirement: Not more than 100 g/L VOCs.
    b. Primer: 1 coat S-W Macropoxy 646-100, B58-600 Series.
    c. Finish: 1 coat S-W Macropoxy 646-100, B58-600 Series with Sharkgrip Slip Reistant Additive.

C. Concrete Masonry Units (CMU) Surfaces:
1. Surfaces Included: Walls.
2. Water-Based System: Premium Quality Acrylic Latex Finish, not less than 39 percent volume solids, over Heavy Duty Acrylic Block Filler.
    a. Block Filler: 1 coat S-W PrepRite Block Filler, B25W25.
    b. Finish:
        1) 2 coats S-W Harmony Interior Latex Flat, B5 Series.
        2) 2 coats S-W Harmony Interior Latex Eg-Shel, B9 Series.
        3) 2 coats S-W Harmony Interior Latex Semi-Gloss, B10 Series.
3. Water-Based Epoxy System, High Moisture Areas, Non-Immersion: Catalyzed Epoxy Coating over Block Filler.
    a. Base Coat/Filler: 1 coat S-W Heavy Duty Block Filler B70 Series.
    b. Finish: 2 coats S-W Waterbased Catalyzed Epoxy, B70 Series.
4. Waterborne Zero-VOC, Low-Odor System: Zero-VOC, Low-Odor Acrylic Finish over Latex Block Filler,
    a. VOC Requirement: Not less than 35 percent solids, ammonia free coating.
    b. Block Filler: 1 coat S-W Preprite Block Filler, B25W25.
    c. Finish:
        1) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Flat, B30-2600 Series..
        2) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Eg-Shel, B20-2600 Series.
        3) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Semi-Gloss, B31-2600 Series..

D. Ferrous and Non-Ferrous Metal Surfaces:
1. Surfaces Included:
    a. Hollow metal doors and frames.
    b. Sound control door assemblies (SCDA).
    c. Steel stairs, ladders and railings.
    d. Pre-painted surfaces.
    e. Prime painted hardware.
    f. Fire extinguisher cabinet trim.
    g. Radiator, convector and other heating unit covers.
    h. Uninsulated piping and ductwork.
    i. Metal access panels.
    j. Metal louvers and grilles.
    k. Electric panels (over factory finish).
    l. Fire horns.
    m. Metal supports for counters, benches and shelves.
    n. Exposed and miscellaneous metals.
    o. Other exposed to view interior ferrous metals not factory finished.
2. Waterborne System: Waterborne 100% Acrylic Gloss Enamel over Waterborne Metal Primer.
    a. Primer (Touch-up if pre-primed): 1 coat S-W Pro-Cryl Universal Primer, B66-310 Series.
    b. Finish:
        1) 2 coats S-W 0 VOC Acrylic Satin, B66-660 Series
        2) 2 coats S-W 0 VOC Acrylic Semi-Gloss, B66-650 Series.
        3) 2 coats S-W 0 VOC Acrylic Gloss, B66-600 Series.
3. Waterborne Zero-VOC, Low-Odor System: Zero-VOC, Low-Odor Acrylic over Waterborne Metal Primer; not less than 35 percent solids, ammonia free coating.
    a. VOC Requirement: Not more than 50 grams VOC's per liter,

b. Primer: 1 coat S-W DTM Acrylic Primer, B66W1.
c. Finish:
1) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Semi-Gloss, B31-2600 Series.
2) 2 coats S-W Zero-VOC Acrylic Gloss, B66-600 Series.

E. Gypsum Wallboard, Gypsum Plaster and Gypsum Veneer Plaster Surfaces:
1. Surfaces Included:
a. Gypsum wallboard, including over skim coat of joint compound.
b. Apply additional coat of primer under deep tone finish paint.
c. Veneer plaster.
2. Sheens, General: Unless noted otherwise on Room Finish Schedule.
a. Walls: Eggshell
b. Ceilings and Soffits: Flat
c. Walls where indicated on Room Finish Schedule: Semi-gloss.
3. Water-Based System: Premium Quality Interior Latex Finish not less than 39 percent volume solids over Premium Quality Latex Primer/Sealer.
a. Primer: 1 coat S-W Harmony Interior Primer, B11-900 Series.
b. Finish:
1) 2 coats S-W Harmony Interior Latex Flat, B5 Series.
2) 2 coats S-W Harmony Interior Latex Eg-Shel, B9 Series.
3) 2 coats S-W Harmony Interior Latex Semi-Gloss, B10 Series.
4. Waterborne Zero-VOC, Low-Odor System: Zero-VOC, Low-Odor Acrylic Finish over Zero-VOC, Low-Odor Acrylic Primer - not more than 50 grams VOCs per liter, not less than 35 percent solids, ammonia free coating.
a. Primer: 1 coat S-W ProMar 200 Zero-VOC Interior Latex Primer, B28W2600 Series.
b. Finish:
1) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Flat, B30-2600 Series.
2) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Eg-Shel, B20-2600 Series.
3) 2 coats S-W ProMar 200 Zero-VOC Interior Latex Semi-Gloss, B31-2600 Series.
5. Waterborne Epoxy System, High Traffic Areas: Waterborne Polyamide Gloss Epoxy Finish over Acrylic Primer/Sealer.
a. Primer: 1 coat S-W Acrylic Primer/Sealer.
b. Finish: 2 coats S-W Zero-VOC Waterbased Catalyzed Epoxy, B73 Series.
6. Wall Surfaces Under Vinyl Wall Coverings: (Primer/Sealer)
a. Primer: 1 coat S-W Pre-Wallcovering Primer, B28W8980.
7. Waterborne Polyurethane System: Low VOC, not more than 150 grams VOC's per liter, and complying with LEED Standards.
a. Primer:
1) 1 coat S-W Pro-Cryl Universal Primer, B66-310 Series.
2) 1 coat Master Coating Technologies/Scuffmaster "Primemaster" Primer/Sealer.
b. Finish:
1) 1 coat Waterbased Acrolon 100, B65-700 Series.
2) 1 coats Master Coating Technologies/Scuffmaster "ScrubTough". For light colors.
3) 2 coats Master Coating Technologies/Scuffmaster "ScrubTough". For dark and bright colors.

F. Plaster Surfaces:
1. Surfaces Included:
a. Plaster, apply additional coat of primer under deep tone finish paint.
b. Walls, ceilings, soffits.
2. Water-Based System: Premium Quality Acrylic Latex Finish, not less than 39 percent volume solids, over Premium Quality Acrylic Latex Primer/Sealer for cured plaster.
a. Primer:
1) 1 coat S-W Harmony Interior Primer, B11-900 Series for cured plaster, only.
2) 1 coat S-W Loxon Concrete and Masonry Primer, A24W8300, for fresh plaster.
b. Finish:
1) 2 coats S-W Harmony Interior Latex Flat, B5 Series.
2) 2 coats S-W Harmony Interior Latex Eg-Shel, B9 Series.
3) 2 coats S-W Harmony Interior Latex Semi-Gloss, B10 Series.
3. Solvertborne Epoxy System, High Traffic Areas: Solventborne Polyamide Gloss Epoxy coating with less than 150 g/L VOCs over Acrylic Primer/Sealer.

a. Primer: 1 coat S-W Pro-Cryl Universal Primer, B66-310 Series.
b. Finish: 1 coat S-W Macropoxy 646-100, B58-600 Series.

4. Waterborne Zero VOC, Low Odor System: (Zero VOC, Low Odor Acrylic Finish over Zero VOC, Low Odor Acrylic Primer - not more than 50 grams VOC's per liter, not less than 35 percent solids, ammonia free coating)
   a. Primer: 1 coat S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600 Series for cured plaster.
   b. Finish:
      1) 2 coats S-W ProMar 200 Zero VOC Interior Latex Flat, B30-2600 Series.
      2) 2 coats S-W ProMar 200 Zero VOC Interior Latex Eg-Shel, B20-2600 Series..
      3) 2 coats S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 Series.
5. Waterborne Polyurethane System: Low VOC, not more than 150 grams VOC's per liter, and complying with sustainability standards.
   a. Primer:
      1) 1 coat S-W Pro-Cryl Universal Primer, B66-310 Series.
      2) 1 coat Master Coating Technologies/Scuffmaster "Primemaster" Primer/Sealer.
   b. Finish:
      1) 1 coat Waterbased Acrolon 100, B65-700 Series.
      2) 1 coats Master Coating Technologies/Scuffmaster "ScrubTough". For light colors.
      3) 2 coats Master Coating Technologies/Scuffmaster "ScrubTough". For dark and bright colors.

G. Wood Surfaces for Painted Finish:
1. Surfaces Included:
   a. Hardwood rails and benches, except where pre-finish is indicated.
   b. Millwork, except where pre-finish is indicated.
   c. Wood doors and frames, except where pre-finish is indicated.
   d. Plywood shelving.
   e. Other wood for paint finish.
   f. Concealed surfaces of wood items to be back-primed.
2. Water-Based System: Premium Quality 100% Acrylic Finish over Acrylic Latex Wood Undercoater.
   a. Primer: 1 coat S-W Premium Interior Wall and Wood Primer, B28W8111.
   b. Finish:
      1) 2 coats S-W 0 VOC Acrylic Semi-Gloss, B66-650 Series.
      2) 2 coats S-W 0 VOC Acrylic Gloss, B66-600 Series.
3. Waterborne Zero-VOC, Low-Odor System: Zero-VOC, Low-Odor Acrylic Finish over Acrylic Latex Wood Primer - not more than 50 grams VOC's per liter, not less than 35 percent solids, ammonia free coating.
   a. Primer: 1 coat S-W Premium Wood Primer, B28W8111.
   b. Finish: 2 coats S-W ProMar 200 Zero-VOC Interior Latex Eg-Shel, B20-2600 Series.

H. Wood Surfaces for Stained and Varnished Transparent Finish:
1. Surfaces Included:
   a. Hardwood handrails and guardrails, except where paint or prefinish is indicated.
   b. Wood doors and frames, except where paint or prefinish is indicated.
   c. Laminated wood benches.
   d. Drawer sides and drawer surfaces concealed in closing position.
   e. Cabinet interiors.
   f. Concealed surfaces of wood items to be back-primed with varnish.
   g. Plywood shelving.
   h. Other wood for stain and varnish (transparent) finish.
2. Waterborne System: Waterborne Acrylic Finishes over Alkyd Penetrating Stain
   a. Transparent Stain: 1 coat S-W Minwax 250 Interior Stains.
   b. Finish: 2 coats S-W Woodclassics Waterborne Varnish, A68 Series.

3.9 SPECIAL SURFACES

A. Metal Ceilings:
1. Coordinate with Division 05 for shop-applied primer.
2. Surfaces Included:

a. Bar joist, decking and supports.
b. Galvanized ductwork.
c. Other overhead metal surfaces.

3. Dry Fall Spray-Applied Waterborne Systems: Waterborne Dryfall over Waterborne Metal Primer
   a. Primer (touch-up if pre-primed): 1 coat 1 coat S-W Pro-Cryl Universal Primer, B66-310 Series.
   b. Finish: 1 coat S-W Waterborne Acrylic Dry Fall, B42W2.

B. Non-Metal Ceilings and Soffits:

1. Surfaces Included:
   a. Gypsum board assemblies.
   b. Plaster assemblies.
   c. Spray fireproofing (SFRM)
   d. Acoustical tile ceilings.
2. Dry Fall Spray-Applied Waterborne System: Waterborne Dryfall over Waterborne Metal Primer.
   a. Primer (touch up if pre-primed): 1 coat S-W Pro-Cryl Universal Primer, B66-310 Series.
   b. Finish: 1 coat S-W Waterborne Acrylic Dry Fall, B42W2.

C. Wood Surfaces for Fire-Retardant Finish: Provide coating capable of achieving required fire-rating, Class A (B, C):

1. Surfaces Included:
   a. Wood ceiling.
   b. Wood paneling.
   c. Wood trim.
   d. Wood equipment panels.
   e. Other wood for fire-retardant finish.
2. Intumescent System: Synthetic Resin finish over Clear Shellac.
   a. Sealer: 1 coat all-purpose 3 lb. cut Clear Shellac.
   b. Intermediate: 1 coat Flame Control Fire Retardant Varnish #166.
   c. Finish: 1 coat Flame Control Fire Retardant Satin Varnish Overcoat #167.

D. Insulation-Wrapped Piping and Equipment:

1. Surfaces Included: Piping, ducts, tanks, and equipment.
2. Waterborne System: Premium Quality Acrylic Latex finish over -Acrylic Primer.
   a. Primer: 1 coat S-W Moisture Vapor Barrier Primer, B72W1.
   b. Finish: 2 coats S-W ProMar 200 Zero-VOC Interior Latex Eg-Shel, B20-2600 Series.

E. Black Enamel Finish:

1. Surfaces Included: Duct throats for visible distance but not less than approximately 24 inches behind supply or return air grilles, registers, louvers.
   a. Wood blocking exposed at reveals.
2. Water-Based Systems, Low-VOC: Acrylic Latex Finish.
   a. Finish: 1 coat S-W ProMar 400 Latex Flat Black, B30W400 Series.

3.10 REPAINTING OF EXISTING SURFACES

A. Existing Surfaces: Existing surfaces where indicated to be repainted.

1. Latex System: 2 coats paint type as listed above.
2. Electrostatic System:
   a. Primer/Finish: 2 coats electrostatic paint finish.

3.11 SMOKE AND FIRE PARTITIONS

A. Stenciling: Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions to be stenciled with the appropriate Hour-rating/Minute rating, i.e., "SMOKE and/or FIRE (1 HR /2 HR) – Protect All Openings," etc. as indicated on the Life Safety Plan, above ceilings on both sides of walls in letters not less than 3 inches high and 3/8 inch wide stroke. Refer to IBC Article 703 for additional information.

1. Stenciling shall be located above every door and no more than fifteen feet on center.
2. Stencil every change in direction of rated walls.

3. Indicate the end of a rated wall with a 2-inch vertical red line with an arrow pointing to the direction of the rated wall.

B. Latex Primer/Finish System: Provide red semi-gloss paint. S-W 0 VOC Acrylic Semi-Gloss, B66-650 Series.

3.12 PIPE PAINTING

A. Painting Colors: Matching Sherwin Williams colors listed below unless the building has other existing standards. Coordinate colors with Owner.

1. High and Low Pressure Steam: Safety Yellow
2. High and Low Pressure Condensate Return Line and Tank: Brass
3. High and Low Pressure Boiler Feed Water: Mill Ivory
4. High and Low Pressure Exhaust Breaching: Silver
5. Domestic Water: Circuit Breaker
6. 120 Degree Hot Soft Water: Polymer Blue
7. Soft water and Polished Soft Water: Hydro Blue
8. Non Potable Water: Toggle Teal
9. Chilled Water Closed Loop & Pumps: Safety Blue.
10. Condenser Water & Pumps: Dewpoint
11. Radiation Closed Loop & Pump: Solar Yellow
12. Reheat Closed Loop & Pump: Junction Yellow
13. Fire Sprinkler Lines: Safety Red
14. A.C. Freon Lines: Plumb
15. Electrical Conduits: Structural Grey.

END OF SECTION

SECTION 099600
HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Coating and finishing of Architecturally Exposed Metal Fabrication Steel (AES) materials with high performance coatings), except as specified.
   2. Preparation of surfaces for high performance coating and finishing.
   3. The Drawings, the provisions of the Contract including the General and Supplementary Conditions and the General Requirements apply to the Work of this Section.

B. Related Sections:
   1. Section 099000 – Painting.

1.2 SUBMITTALS

A. Samples: Submit coating finish samples in accordance with Section 013300, for color selection and finish acceptance.
   1. Architect reserves right to select color or finish from manufacturer specified, as necessary, to achieve desired color or finish.
      a. Mix coating to match chips, where necessary.
   2. Schedule: For acceptance, submit 3 copies of complete schedule showing each product by brand name proposed to be used at each surface and location.
      a. Generally follow specified outline and list number of coats.
      b. Submit within 30 days after award of contract.

B. Product Data: Include primers for each coating system specified.
   1. Material List: Provide inclusive list of required coating materials.
      a. Indicate each material and cross-reference specific coating, finish system, and application.
      b. Identify each material by manufacturer's catalog number and general classification.
   2. Manufacturer’s Information: Provide manufacturer’s technical information, including label analysis and instructions for handling, storing and applying each coating material proposed for use.

1.3 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide primers and undercoat coating produced by same manufacturer as finish coats.

B. Compatibility: Provide materials that are compatible with one another and substrates indicated under conditions of service and application, as demonstrated by manufacturer of coating system based on testing and field experience.

C. Provide protection during removal of existing rust, coatings, or other films from steel. Surface preparation of steel by sanding, scraping or other means may create dust or particles containing lead or other hazardous substances.
   1. Protect roofing membrane as required, coordinate with membrane manufacturer.

D. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of total systems for various substrates.
   1. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

E. Approved Applicator: Applicator shall have not less than 3 years of successful experience in installation of similar coating systems and shall be certified in writing as manufacturer’s licensed or approved applicator.

F. Sheen Types:
   1. Manufacturer’s standard sheen for specified product.

a. Flat: Less than 5 units based on 60 degrees.
b. Eggshell: 5 to 20 units based on 60 degrees.
c. Satin/Low Luster: 15 to 35 units based on 60 degrees.
d. Semi-gloss: 30 to 65 units based on 60 degrees.
e. Gloss: Above 65 units based on 60 degrees.

G. Owner reserves the right to have testing agency test materials used as often as deemed necessary during period when coatings are being applied to ensure that product materials being used comply with specified requirements.

1.4 MAINTENANCE MATERIALS

A. Leave on premises, where directed by Owner, not less than one unopened gallon of each color used.

B. Tightly seal containers and clearly label for identification.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver coating materials in sealed original labeled containers, bearing manufacturer's name, type of coating, brand name, color designation and instructions for mixing or reducing.

B. Provide adequate storage facilities. Store coating materials at minimum ambient temperature of 45 degrees F. in well ventilated area. Restrict storage to coating materials and related equipment.

C. Take precautionary measures to prevent fire hazards and spontaneous combustion. Comply with health and fire regulations.

1.6 PROJECT CONDITIONS

A. Environmental Requirements: Comply with manufacturer's recommendations for environmental conditions under which coating and finishing can be applied.
1. Do not apply finish in areas where dust is being generated.

B. Measure moisture content of surfaces using electronic moisture meter.
1. Do not apply finishes unless moisture contents of surfaces are below manufacturer's maximums.

C. Ensure surface temperature or surrounding air temperature is between 50 degrees F. and 90 degrees F. before applying finishes.
1. Minimum application temperature for exterior work is 50 degrees F.

D. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 45 degrees F. for 24 hours before, during and 48 hours after application of finishes.

E. Provide minimum 25 foot candles of lighting on surfaces to be finished.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. High Performance Coatings Manufacturers:
1. ICI/Dulux,
2. Pittsburg Paints,
3. Tnemec Company, Inc.,

B. Materials: Coating or finish materials selected for each type of surface shall be product of single manufacturer.

C. Colors: As indicated on Drawings.

2.2 MIXING AND TINTING

A. Deliver coatings and enamel ready-mixed to job site. Accomplish job mixing and job tinting only when acceptable. Use tinting colors recommended by manufacturer for specific type of finish.

2.3 MATERIALS

A. Refer to attached high performance coating and finishing schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive high performance coatings for conditions that would adversely affect execution, permanence or quality of work and which cannot be put into acceptable condition through preparatory work.
   1. Do not proceed with surface preparation or coating application until conditions are suitable.

3.2 PREPARATION OF SURFACES

A. Perform preparation and cleaning procedures in accordance with coating manufacturer's instructions and as specified, for each particular substrate condition.
   1. Remove mildew, by scrubbing with solution of detergent, bleach and warm water.
      a. Rinse with clean water and allow surface to dry completely.
   2. Remove surface contamination from aluminum surfaces requiring finish by steam, high pressure water or solvent washing.
      a. Apply etching primer or acid etch.
      b. Apply coating immediately if acid etching.
   3. Provide barrier coats over incompatible primers or remove and re-prime as required.
      a. Notify Architect in writing of anticipated problems in using specified coating systems with substrate primed by others.

B. Finishes for steel labeled Architecturally Exposed Steel shall comply with these additional requirements: smooth exposed surface and edges, including welds, by grinding and fill depressions, voids and holes with weld material and/or auto body filler, sand smooth, prime and coat.

C. Clean surfaces to be coated before applying coating or surface treatment. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning.
   1. Program cleaning and coating so that dust and other contaminants from cleaning process will not fall in wet, newly coated surfaces.
      a. Apply compatible sealer or primer.

D. Equipment used for blast cleaning shall be of type that has proper oil and water filters and traps on compressors and/or tanks so that sandblasting material is not being re-contaminated by oil and water in the air blast.

E. Ferrous Metals: Clean non-galvanized, ferrous surfaces that have not been shop-coated of oil, grease, loose mill scale and other foreign substances by solvent or mechanical cleaning, complying with The Society for Protective Coatings (SSPC)-SP6.
   1. Touch-up shop-applied prime coats which have damaged or bare areas. Wire-brush, solvent clean, and touch-up with same primer as shop coat.
      a. Clean unprimed steel surfaces by washing with solvent. Apply treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned.
      b. Prime surfaces to indicate defects. Coat after defects have been remedied.
      c. Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather out edges to make touch-up patches inconspicuous.
      d. Clean surfaces with solvent. Prime bare steel surfaces. (Prime steel including shop primed steels.)

3.3 MATERIALS PREPARATION

A. Mix and prepare coating materials and transparent finish materials in accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers.

1. Maintain containers used in storage, mixing, and application of coating in clean condition, free of foreign materials and residue.

C. Stir materials before application to produce mixture of uniform density, and as required during application of materials.
   1. Do not stir film which may form on surface into material.
   2. Remove film and, if necessary, strain material before using.

3.4 APPLICATION

A. Schedule Coatings: Apply first coat to surfaces that have been cleaned, pre-treated or otherwise prepared for coating as soon as practicable after preparation and before subsequent surface deterioration.
   1. Number of coats and film thickness required is the same regardless of application method employed.

B. Apply high performance coating with brush, roller, spray, or other acceptable practice in accordance with manufacturer's directions.
   1. Use brushes best suited for type of material being applied. Use rollers of carpet, velvet back, or high pile sheep wool recommended by coating manufacturer for material and texture required.
      a. Apply each coat at proper consistency.
      b. Each coat shall be slightly darker than preceding coat unless otherwise approved by Architect.
      c. Provide finish coats which are compatible with prime coatings used.

C. Do not apply succeeding coats until previous coat has completely dried, unless directed otherwise by manufacturer.
   1. Sand between each enamel or varnish coat application with fine sandpaper, or rub surfaces with pumice stone where required to produce even, smooth surface in accordance with coating manufacturer's directions.

D. Apply additional coats when undercoats, or other conditions show through final coat, until coating film is of uniform finish, color and appearance.
   1. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive film thickness equivalent to that of flat surfaces.
      a. Apply each material at not less than manufacturer's recommended spreading rate, to provide total dry film thickness as recommended.
      b. Apply first-coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for coating as soon as practicable after preparation and before subsequent surface deterioration.

E. Allow sufficient time between successive coatings to permit proper drying.
   1. Do not recoat until coat has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat does not cause lifting or loss of adhesion of undercoat.

F. Prime Coats: Recoat primed and sealed areas where there is evidence of suction spots or unsealed areas in first coat, to assure finish coat with no burn-through or other defects due to insufficient sealing.

G. Stipple Enamel Finish: Roll and redistribute coating to even and fine texture. Leave no evidence of rolling such as laps, irregularities in texture, skid marks, or other surface imperfections.

H. Brush Application: Brush-out and work brush coats onto surfaces in even film.
   1. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropeyness, or other surface imperfections will not be acceptable.
   2. Neatly draw glass and color break lines.

3.5 CLEANING

A. As work proceeds and upon completion, promptly remove coating where spilled, splashed or spattered.

1. Touch up and restore damaged or defaced coated areas.

B. During progress of work keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris.
   1. Remove at end of each work day.

C. Upon completion of work clean coating-spattered surfaces and leave premises neat and clean, to satisfaction of Owner's Representative.

3.6 PROTECTION

A. Adequately cover or otherwise protect finished work of other trades and other surfaces from coating and damage.
   1. Repair damage as result of inadequate or unsuitable protection as acceptable to Owner's Representative.
      a. Furnish sufficient drop cloths, shields and protective equipment to prevent spray or droppings from fouling surfaces not being coated and in particular, surfaces within storage and preparation area.
      b. Place cotton waste, cloths and material which may constitute fire hazard in closed metal containers and remove daily from site.

B. Provide "Wet Paint" signs as required to protect newly coated finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of coating operations.

3.7 FIELD QUALITY CONTROL

A. Comply with these additional requirements; smooth exposed surface and edges at steel, including welds, by grinding and fill depressions, voids and holes with weld material and/or auto body filler, sand smooth, prime and coat as recommended by coating manufacturer. Apply by brush or spray to provide minimum dry film thickness of 2 mils or as recommended by coating manufacturer. Insure that coating film is complete and undamaged as approved by Owner's Representative.

END OF SECTION

SECTION 101100
VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Tackboards.
   2. Markerboards.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Include computer system requirements for electronic markerboards.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Show location of panel joints.
   2. Show location of special-purpose graphics for visual display surfaces.
   3. Include sections of typical trim members.

C. Samples for Initial Selection:
   1. Actual sections of each type of visual display surface as indicated.
   2. Samples of accessories involving color selection.

D. Samples for Verification: For each type of visual display surface indicated and as follows:
   1. Visual Display Surface: Not less than 8-1/2 by 11 inches, mounted on substrate indicated for final Work. Include one panel for each type, color, and texture required.
   2. Trim: 6-inch- long sections of each trim profile.

E. Maintenance Data: For visual display surfaces to include in maintenance manuals.

F. Warranties: Special warranties specified in this Section.

1.3 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of visual display surfaces and are based on the specific system indicated. Refer to Section 016210 - Product Options and Substitution Requirements.
   1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

B. Fire-Test-Response Characteristics: Provide fabrics with the surface-burning characteristics indicated, as determined by testing identical products per ASTM E84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1.4 PRODUCT HANDLING

A. Deliver factory-built visual display boards, including factory-applied trim where indicated, completely assembled in one piece without joints, where possible. If dimensions exceed maximum manufactured panel size, provide two or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, pre-fit components at the factory, disassemble for delivery, and make final joints at the site.

B. Store visual display units vertically with packing materials between each unit.

1.5 WARRANTY

A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer's standard form in which manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Surfaces lose original writing and erasing qualities.
      b. Surfaces become slick or shiny.
      c. Surfaces exhibit crazing, cracking, or flaking.
   2. Warranty Period: 50 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MARKERBOARDS

A. Description: 24 gauge Porcelain Enamel Steel Skin mounted on 7/16 inch MDF core with moisture barrier backing.
   1. Core: Medium density fiberboard
   2. Moisture Backing: 0.005 inch aluminum foil
   3. Finish panel: Low gloss.
   4. Color: White
   5. Size: As indicated on Drawings
   6. Trim: 1-1/4 inch exposed aluminum face, satin anodized finish
   7. Option: Marker tray, full length
   8. Attachment: Angle clips at 24 inches on center.
   9. Product: Claridge, Type A, Series 3 by Claridge Products.
      a. Other Acceptable Manufacturers:
         1) ADP Lemco Incorporated.

2.2 MID-GLOSS MARKERBOARDS

A. 24 gauge enameling steel with porcelain/ceramic finish. Reduced gloss for enhanced projection ability.
   1. Color: White
   2. Color as selected from minimum of 3 colors.
   3. Size: As indicated on Drawings.
   4. Trim: 1-1/4 inch exposed aluminum face, satin anodized finish
   5. Option: Marker tray, full length
   6. Attachment: Angle clips at 24 inches on center.

B. Product: "Porcelain Plus" by PolyVision
   1. Other acceptable manufacturer:
      a. Claridge Products
      b. ADP Lemco Incorporated.

2.3 TACKBOARDS

A. Sealed Composition Cork, Manufacturer: PolyVision, or ADP Lemco Incorporated.
   1. Sealed Composition Cork: Seamless sheet 1/4 inch thick bulletin board cork with washable vinyl finish, of composition cork compressed with resinous binder and integral color throughout entire thickness and laminated to burlap backing.
      a. Flame Spread Rating: Complying with ASTM E84, with flame spread rating of 65.
   2. Color: As selected from 3 Forbo North American standard colors.

B. Plastic Impregnated Cork, Manufacturer: Krommenie Cork.
      a. Other Acceptable Manufacturers: Claridge Products [Dodge Cork], PolyVision.
   1. Plastic Impregnated Cork: Seamless sheet, Krommenie type 1/4 (1/8) inch thick bulletin board cork with washable vinyl finish, of ground natural cork compressed with resinous binder and integral color throughout entire thickness and laminated to burlap backing.

a. (NOTE: Limited Use: Framed maximum 8 foot by 4 foot boards with no adhesive. Not to be used so as to be interpreted as a wall finish material.)

2. Color: As selected from minimum of 8 standard colors.

2.4 FULL WALL TACKBOARDS

A. Self-healing integrally colored tackable surface.

1. Width: 148 inches
2. Backing: Jute
3. Attachment: Adhesive
4. Product: TAC-WAL by WALLTALKERS
5. Color: As indicated on Drawings

2.5 FABRICATION

A. Factory pressure laminate board surfaces to 1/2 inch gypsum board, or 1/2 inch particle board, 0.015 aluminum balance sheet.

B. Markerboards shall be fully backed with aluminum foil.

C. Factory assemble visual display boards in accordance with reviewed shop drawings.

D. Make joints only where total length exceeds maximum manufactured length (16 feet by 4 feet or 12 feet by 5 feet). Fabricate with minimum number of joints, balanced around center of board.

E. Provide mullion trim at joints between markerboard and tackboard. Provide vertical spline joint system between abutting sections of markerboard.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which visual display boards are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install visual display boards in accordance with reviewed shop drawings and manufacturer's printed instructions. Keep perimeter lines straight, plumb and level. Do not glue display boards or markerboards to wall. Mechanically fasten only.

B. Provide grounds, clips, backing, brackets, anchors, trim and accessories. Use splines at joints to maintain surface alignment and smooth joints.

C. Set visual display boards plumb and level, and securely attach to adjacent construction. Join parts with neat, precision fit.

D. Clean units in accordance with manufacturer's instructions.

END OF SECTION

SECTION 101420
INTERIOR SIGNAGE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Engraved signs for doors listed in door schedule.
   2. Double sided tape for attachment.

1.2 SAMPLES

A. Submit samples in accordance with Section 013300.

B. Provide one full size sample sign, of type, style and color specified including method of attachment.

1.3 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 013300.

B. Provide listing of sign types, lettering and locations, to be attached along with overall dimension of each sign.

1.4 DELIVERY

A. Package separately or in like groups of names, labeled as to names enclosed. Include installation template, hardware or adhesive specified and installation instructions.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturer and Type: Plastic laminate signs by Archetype

2.2 TYPE

A. Acrylic type complete with adhesive attachment for mounting.

2.3 COMPONENTS

A. Signs: Laminated colored plastic signs at Common Rooms; core color contrasting to exterior face color; total thickness 0.125 inch; 4-5/8 inches tall by 8-1/2 inches wide. Lettering high relief through face material to expose core.
   1. Match Owner's Standards.
   2. Colors to match Owner's Standards.

B. Signs: Laminated colored plastic signs at Rest Rooms; core color contrasting to exterior face color; total thickness 0.125 inch; 8-5/8 inches tall by 8-1/2 inches wide. Lettering high relief through face material to expose core.
   1. Match Owner's Standards.
   2. Colors to match Owner's Standards.

2.4 LETTERING

A. Size and Style: Match Owner's Standards.

B. Colors: Match Owner's Standards.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install signs after door surfaces are painted and finished, in locations as directed by Architect.

B. Install centered and level, in line, in accordance with the manufacturer's recommendations.

C. Clean and polish, remove excess adhesive.

END OF SECTION

SECTION 122413
ROLLER WINDOW SHADES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Shades at windows, where indicated.

B. Related Sections:

1. Section 061000 - Rough Carpentry: For wood blocking and grounds for mounting roller shades and accessories.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.

1. Motorized Shade Operators: Include operating instructions.

B. Shop Drawings: Show location and extent of roller shades. Include elevations, sections, details, fabric width and dimensions not shown in Product Data. Show installation details, mountings, attachments to other work, operational clearances, and relationship to adjoining work.

1. Motorized Shade Operators: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
2. Wiring Diagrams: Power, system, and control wiring.

C. Shade Material Samples for Verification: Not less than 3 inches square, with specified treatments applied. Mark face of material.

D. Product Certificates: For each type of roller shade, signed by product manufacturer.

E. Qualification Data: For Installer.

F. Product Test Reports: For each type of roller shade.

G. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:

1. Methods for maintaining roller shades and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
3. Operating hardware.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Source Limitations: Obtain roller shades through one source from a single manufacturer.

C. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Flame-Resistance Ratings: Passes NFPA 701.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. Product Standard: Provide roller shades complying with WCMA A 100.1.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same designations indicated on Drawings and in a window treatment schedule.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide either the specified products or comparable products by one of the following manufacturers:
   1. MechoShade Systems, Inc.,
   2. Draper Inc.,
   3. Hunter Douglas, Inc.,
   4. SWF Contract (Springs Window Fashion)
   5. or equal.

2.2 MANUALLY-OPERATED ROLLER SHADES

A. Manually-Operated Visually Transparent Shade: Manual roller shades, with fascia, continuous stainless-steel bead-chain operator and related heavy duty mounting systems and accessories.
   1. Product and Manufacturer: “Mecho/5” by MechoShade Systems, Inc..
   2. Visually-Transparent Single-Fabric Shade: Extruded vinyl-coated polyester yarn consisting of approximately 79 percent reinforced vinyl and 21percent polyester core yarn; with straight bottom hem.
      a. Open Linear Weave: "ThermoVeil 1800 Series" by MechoShade Systems, Inc..
         1) Openness Factor: 15 percent.
      b. Open Basket Weave: "ThermoVeil 2100 Series" by MechoShade Systems, Inc..
         1) Openness Factor: 10-12 percent.
      c. Dense Basket Weave: “Thermoveil 1300” by MechoShade Systems, Inc..
         1) Openness Factor: 5 percent.
      d. Extra Dense Twill Weave Reversible Fabric: “EuroTwill 6000 Series” by MechoShade Systems, Inc..
         1) Openness Factor: 3 percent.
      e. Dense Linear Weave: "ThermoVeil 1000 Series" by MechoShade Systems, Inc..
         1) Openness Factor: 2-3 percent.
      f. Extra-Dense Linear Weave: "ThermoVeil 0900 Series" by MechoShade Systems, Inc..
         1) Openness Factor: 0-1 percent.
      g. Color and Pattern: As selected by Architect from Manufacturer’s full range.
   3. Visually-Transparent, PVC-Free Single-Fabric Shade: PVC-free cloth fabricated from TPO yarn; Cradle to Cradle certified; with straight bottom hem.
      a. Open Basket Weave: “EcoVeil 1350 Series” by MechoShade Systems, Inc..
         1) Openness Factor: 5 percent.
      b. Color and Pattern: As selected by Architect from Manufacturer’s full range.

B. Manually-Operated Blackout Shade: Manual blackout roller shades with fascia, continuous stainless-steel bead-chain operator and related heavy duty mounting systems and accessories.
   1. Product and Manufacturer: “Mecho/5” by MechoShade Systems, Inc..
   2. Blackout Shade: Opaque shade, 0 percent openness factor; straight bottom hem.
      a. Blackout Single-Fabric Shade with Opaque Acrylic Backing: “ThermoVeil Equinox 0100 Series” by MechoShade Systems, Inc..
         1) Material: 53 percent fiberglass, 45 percent acrylic, 2 percent polyester finish (PVC-free).

b. Blackout Single-Fabric for A/V Applications: “ThermoVeil Equinox 0700 Series” by MechoShade Systems, Inc..
1) Material: 79 percent reinforced vinyl and 21percent polyester.
3. Color and Pattern: As shown on Drawings.

C. Manually-Operated Double-Roller Shade: Manual roller shades, with fascia, continuous stainless-steel bead-chain operator and related heavy duty mounting systems and accessories.
1. Product and Manufacturer: “Mecho/5 DoubleShades” by MechoShade Systems, Inc..
2. Transparent Shade, Interior Face:
3. Blackout Shade, Exterior Face:

2.3 MOTOR-OPERATED ROLLER SHADES

A. Motor-Operated Visually-Transparent Shade: Motor-operated roller shades, with [**fascia,**] and related heavy duty mounting systems and accessories.
1. Product and Manufacturer: “ElectroShade” by MechoShade Systems, Inc..
2. Visually-Transparent Single-Fabric Shade: Extruded vinyl-coated polyester yarn consisting of approximately 79 percent reinforced vinyl and 21percent polyester core yarn; with straight bottom hem.
a. Open Linear Weave: "ThermoVeil 1800 Series" by MechoShade Systems, Inc..
1) Openness Factor: 15 percent.
b. Open Basket Weave: "ThermoVeil 2100 Series" by MechoShade Systems, Inc..
1) Openness Factor: 10-12 percent.
c. Dense Basket Weave: “Thermoveil 1300” by MechoShade Systems, Inc..
1) Openness Factor: 5 percent.
d. Extra Dense Twill Weave Reversible Fabric: “EuroTwill 6000 Series” by MechoShade Systems, Inc..
1) Openness Factor: 3 percent.
e. Dense Linear Weave: "ThermoVeil 1000 Series" by MechoShade Systems, Inc..
1) Openness Factor: 2-3 percent.
f. Extra-Dense Linear Weave: "ThermoVeil 0900 Series" by MechoShade Systems, Inc..
1) Openness Factor: 0-1 percent.
g. Color and Pattern: As selected by Architect from Manufacturer’s full range.
3. Visually-Transparent, PVC-Free Single-Fabric Shade: PVC-free cloth fabricated from TPO yarn; Cradle to Cradle certified; with straight bottom hem.
a. Open Basket Weave: “EcoVeil 1350 Series” by MechoShade Systems, Inc..
1) Openness Factor: 5 percent.
b. Color and Pattern: As shown on Drawings.

B. Motor-Operated Blackout Shade: Motor-operated, blackout roller shades, with fascia**,** and related heavy duty mounting systems and accessories.
1. Product and Manufacturer: “ElectroShade” by MechoShade Systems, Inc..
2. Blackout Shade: Opaque shade, 0 percent openness factor; straight bottom hem.
a. Blackout Single-Fabric Shade with Opaque Acrylic Backing: “ThermoVeil Equinox 0100 Series” by MechoShade Systems, Inc..
1) Material: 53 percent fiberglass, 45 percent acrylic, 2 percent polyester finish (PVC-free).
b. Blackout Single-Fabric for A/V Applications: “ThermoVeil Equinox 0700 Series” by MechoShade Systems, Inc..
1) Material: 79 percent reinforced vinyl and 21percent polyester.
3. Color and Pattern: As shown on Drawings.

2.4 SYSTEM COMPONENTS

A. Provide complete system with side angles, bottom bar, headbox, sponge liner, roller tube, controls, wiring, switches, fascia panel, and necessary accessories and fasteners.

B. Rollers: Electro-galvanized or epoxy primed steel or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with manufacturer's standard method for attaching shade material. Provide capacity for one roller shade band per roller, unless otherwise indicated.

C. Mounting Brackets: Galvanized or zinc-plated steel, painted to match fascia (where applicable).

D. Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as indicated on Drawings; removable design for access.

1. Top/Back Cover: L-shaped; material and finish to match fascia; combining with fascia and end caps to form a six-sided headbox enclosure sized to fit shade roller and operating hardware inside.
2. Pocket-Style Headbox: U-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; with a bottom cover consisting of slot opening of minimum dimension to allow lowering and raising of shade and a removable or an openable, continuous metal access panel concealing shade roller, brackets, and operating hardware and operators within.

E. Pocket with Ceiling Slot Opening: Six-sided box units for recessed installation; fabricated from formed-steel sheet, extruded aluminum, or wood; with a bottom consisting of slot opening of minimum dimension to allow lowering and raising of shade and a removable or an openable, continuous metal access panel concealing rollers, brackets, and operating hardware and operators within.

F. Bottom Bar: Steel or extruded aluminum, with metal capped ends. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.

G. Mounting: As indicated on Drawings, mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.

H. Shade Operation: Manual, with continuous-loop bead-chain, clutch, and cord tensioner and bracket lift operator.

1. Bead Chain: Stainless steel.
2. Operating Function: Stop and hold shade at any position in ascending or descending travel.

2.5 ROLLER SHADE FABRICATION

A. Product Description: Roller shade consisting of a roller, a means of supporting the roller, a flexible sheet or band of material carried by the roller, a means of attaching the material to the roller, a bottom bar, and an operating mechanism that lifts and lowers the shade.

B. Concealed Components: Noncorrodible or corrosion-resistant-coated materials, with permanently lubricated moving parts.

C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings.

D. Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting roller, and operating hardware and for hardware position and shade mounting method indicated.

E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.

F. Color-Coated Finish: For metal components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

2.6 MOTORIZED ROLLER SHADE OPERATORS

A. General: Provide factory-assembled motorized shade operation systems designed for lifting shades of type, size, weight, construction, use, and operation frequency indicated. Provide operation systems of size and capacity and with features, characteristics, and accessories suitable for Project conditions and recommended by shade manufacturer, complete with electric motors and factory-prewired motor controls, remote-control stations, remote-control devices, power disconnect switches, enclosures protecting controls and all operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with the building electrical system.

B. Comply with NFPA 70.

C. Control Equipment: Comply with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6 with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.

D. Electric Motors: UL-approved or -recognized, totally enclosed, insulated motor, complying with NEMA MG 1, with thermal-overload protection, brake, permanently lubricated bearings, and limit switches; sized by shade manufacturer to start and operate size and weight of shade considering service factor or considering Project's service conditions without exceeding nameplate ratings.

1. Service Factor: According to NEMA MG 1, unless otherwise indicated.
2. Motor Characteristics: Single phase, [**24**] [**110**] [**220**] V, 60 Hz.
3. Motor Mounting: Within manufacturer's standard roller enclosure.

E. Remote Controls: Electric controls with NEMA ICS 6, Type 1 enclosure for recessed or flush mounting. Provide the following devices for remote-control activation of shades:

1. Individual/Group Control Stations: Momentary-contact, three-position, rocker-style, wall switch-operated control station with open, close, and center off functions for individual and group control.

F. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop shade at fully raised and fully lowered positions.

G. Operating Function: Stop and hold shade at any position.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances,and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions, and located so shade band is not closer than 2 inches to interior face of glass.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller shade surfaces after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage factory-authorized service representative to train Owner maintenance personnel to adjust, operate, and maintain system.

END OF SECTION