

Project Manual for:

**ITD D6 MAINTENANCE BLDG.
EXTENSION & RENOVATION**

Challis, Idaho



December 2025

Myers ■ Anderson

Architecture ■ Interiors ■ Planning ■ Preservation

**BID
SET**

PROJECT MANUAL FOR
ITD D6 Maintenance Bldg. Extension & Renovation
Salmon, Idaho

Idaho Transportation Department
District 6
206 North Yellowstone,
Rigby, ID 83442

December 2025

Architect's Project No. 25684

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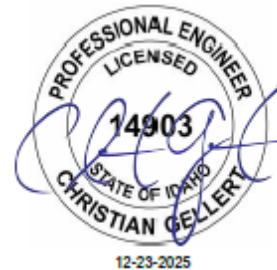


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DIVISION 01 GENERAL REQUIREMENTS

SECTION 01 10 00

SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Fixed Price Construction Contract and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 1. Work covered by Contract Documents.
 2. Work by Owner.
 3. Work under separate contracts.
 4. Access to site.
 5. Coordination with occupants.
 6. Work restrictions.
 7. Permits.
 8. Waste Disposal.
 9. Testing and Inspection.
 10. Specification and drawing conventions.
- B. Related Requirements:
 1. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project entails an addition or extension of the existing maintenance shed. The three existing bays will be extended on the north side with bay doors on two of the three. A meeting room will be added to the NW corner. The existing office, restroom, workstations, and mechanical room will be updated, including bringing the restroom into ADA compliance. The existing floor slab in the bays will be replaced. The existing roof assembly above the concrete T structure will also be replaced.

1.4 WORK BY OWNER

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.
- B. Items noted NIC (Not in Contract), will be furnished and installed by the Owner/Agency.

1.5 WORK UNDER SEPARATE CONTRACTS

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

1.6 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project, and by use of facility by building tenants in existing tenant improvement Projects.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits: Confine construction operations to the areas of work indicated on and in the drawings and specifications.
 - 2. Driveways, Walkways and Entrances: Keep driveways loading areas, etc. and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - c. Contractor parking shall be limited to those areas indicated on the Contract Document and as designated by the Owner.
 - d. Maintain clear access to project at all times for firefighting equipment. Maintain exit ways from existing building required by authorities having jurisdiction.
 - e. Signs: Provide signs adequate to direct visitors.
 - 1) Do not install, or allow to be installed, signs other than specified sign(s) and signs identifying the principal entities involved in the project.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Any damage to the building, due to negligence on behalf of the contractor to not maintain a weather-tight condition, shall be the responsibility of contractors and they shall bear the burden for correction and/or repairs for any damage. Repair damage caused by construction operations.
- D. Security: The contractor shall maintain security of the building and any staging areas throughout the project.

1.7 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.

2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.
3. The Owner will take special care not to damage materials or work completed by the contractor prior to final acceptance. If the contractor occurs any damages, prior to final acceptance, they need to notify the Owner and Architect immediately for verification of damages. If the contractor fails to notify the Owner and Architect within 24 hours of the incident, the contractor shall be responsible for the performance and shall bear the cost of correction.

1.8 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, unless otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify Owner not less than 3 days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 1. Notify Owner not less than 2 days in advance of proposed disruptive operations.
- E. Hazardous Materials: Notify the Design Professional and Owner immediately upon discovery of existing hazardous materials.
- F. Nonsmoking Building: Smoking is not permitted within the building or on Idaho Transportation Department property.
- G. Controlled Substances: Use of tobacco products and other controlled substances is not permitted per Section 72-1717, Idaho Code.
- H. Contractor Parking: Coordinate with Idaho Transportation Department for Contractor parking.
- I. On Owner/Tenant occupied projects, maintain cleanliness in areas adjacent to and surrounding the construction area to the satisfaction of the Owner at all times.
- J. On Owner/Tenant occupied projects, ensure deliveries and contractor work access are in accordance with previous agreement with Owner and/or as indicated in the Contract Documents.

1.9 PERMITS

- A. Furnish all necessary permits for construction of the Work.

1.10 WASTE DISPOSAL

- A. The contractor is responsible for any and all demolition and/or removal as necessary and required to fulfill the requirements of the Contract Documents.

1.11 TESTING AND INSPECTION

- A. Notify Owner/Engineer at least 24 hours prior to commencement of Work requiring special inspection.

1.12 SPECIFICATION AND DRAWING CONVENTIONS

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit electronic copy of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.

- i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

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

1.5 PROCEDURES

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

1.6 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.

- g. Requested substitution provides specified warranty.
- h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Fixed Price Construction Contract and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue through contractor supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time on AIA Document G710, "Architect's Supplemental Instructions".

1.4 PROPOSAL REQUESTS

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

2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Work Change Proposal Request Form: Use form acceptable to Architect.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, the Architect will complete the Owner's Change Order Form and attach the Proposal Request and back-up. The Architect will then forward this documentation to the Owner's Project Manager who will create a Change Order for approval of the Owner and Contractor.

1.6 CONSTRUCTION CHANGE DIRECTIVE

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 SCHEDULE OF VALUES

- A. Submit printed schedule on AIA G703 - Continuation Sheet for G702 Contractor's standard form or electronic media printout will be considered for this use.
- B. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement
- C. Format: Use Table of Contents of this Project Manual
 1. Identify each line item with number and title of major Specification Section
 2. Identify line item for site mobilization, bonds and insurance, and project closeout.
 3. Include the following Project identification of the Schedule of Values:
 - a. Project name and location
 - b. Name of General Contractor
 - c. Name of Architect
 - d. Owner's project number
 - e. Date of submittal.
 4. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division
 - b. Description of the Work
 - c. Change Orders (numbers) that affect value.
 - d. Dollar value
 5. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluations of Applications of Payment and progress reports.
 6. Coordinate with the Project Manual table of contents.
 7. Provide several line items for principal subcontract amounts, where appropriate
 8. Round amounts to nearest whole dollar; total shall equal the Contract.
 9. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not installed.
 - a. Differentiate between items stored on-site and items stored off-site.
 - b. Include evidence of insurance or bonded warehousing if required.
 10. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 11. Each item in the Schedule of Values and Applications for Payment shall be complete.
 - a. Include total cost and proportionate share of general overhead and profit

- for each item.
- b. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
- D. Include within each line item, direct proportional amount of Contractor's overhead and profit.
- E. Revise schedule to list approved Change Orders with each Application for Payment

1.2 APPLICATION FOR PAYMENT

- A. Submit one copy of each Application for Payment on AIA G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet for G702 or approved equal.
- B. Content and Format: Use Schedule of Values for listing items in Application for Payment
- C. Complete every entry on form.
 - 1. Execute by a person authorized to sign legal documents on behalf of Contractor.
 - 2. Architect will return incomplete applications without action.
 - 3. Entries shall match data on the Schedule of Values.
 - 4. Include amounts of Change Orders approved before last day of construction period covered by application.
- D. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
- E. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor
 - 1. The period of construction work covered by each Application of Payment is the period indicated in the Agreement.
- F. Administrative actions and submittals that must precede or coincide with submittal of first Application of Payment include the following:
 - 1. List of subcontractors (if applicable)
 - 2. Schedule of Values
 - 3. Submittals Schedule (preliminary if not final).
 - 4. List of Contractor's staff assignments
 - 5. Copies of permits (if applicable)
 - 6. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 - 7. Initial progress report
- G. Submit with transmittal letter as specified for Submittals in Section 01 33 00 - Submittal Procedures
 - 1. One signed original copy of Application for Payment to the Architect
- H. Submit updated construction schedule with each Application for Payment
- I. After issuing the Certificate of Substantial Completion, submit an Application of Payment showing 95 percent completion of portion of the Work claimed as substantially complete.
 - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

- J. Submit final Application for Payment showing 100 percent completion with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. As-Built Drawings
 2. Operation and Maintenance Manual
 3. All Warranties and Guarantees
 4. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 5. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims"
 6. AIA Document G707, "Consent of Surety to Final Payment"
 7. Letter stating all punch list items are completed and accepted.
 8. Release of Claims form
 9. Project Finalization and Start-Up Form

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Fixed Price Construction Contract and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Definitions
 - 2. Informational Submittals
 - 3. General coordination procedures.
 - 4. Coordination drawings.
 - 5. RFIs.
 - 6. Digital project management procedures.
 - 7. Project meetings.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.3 DEFINITIONS

- A. BIM: Building Information Modeling.
- B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Key Personnel Names: Within seven (7) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

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

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

1.6 COORDINATION DRAWINGS

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

resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
 9. Review: Design Professional will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Design Professional determines that coordination drawings are not prepared in sufficient scope or detail, or are otherwise deficient, Design Professional will so inform Contractor, who shall make changes as directed and resubmit.
 10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01 33 00 "Submittal Procedures."
 11. Review: Architect will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility.

- C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
 - 1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
 - 2. File Submittal Format: Submit or post coordination drawing files using PDF format.
 - 3. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
 - a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - b. Digital Data Software Program: Drawings are available in AutoCad 2013.
 - c. Contractor shall execute a data licensing agreement in the form of Agreement included in this Project Manual.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI.
 - 1. Design Professional will approve RFIs with any comments.
 - 2. Design Professional shall notify Owner of the Design Professional's Representative who will receive and respond to RFIs.
 - 3. Contractor shall submit RFIs in a prompt manner so as to avoid delays in the work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. RFI subject.
 - 2. Specification Section number and title and related paragraphs, as appropriate.
 - 3. Drawing number and detail references, as appropriate.
 - 4. Field dimensions and conditions, as appropriate.
 - 5. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 6. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven (7) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 - 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 - 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.

3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor's proposed change order according to Section 01 26 00 "Contract Modification Procedures".
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within seven (7) days of receipt of the RFI response.
- D. On receipt of Architect's action: Review response and notify Architect within seven (7) days if Contractor disagrees with response.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Architect's Digital Data Files: Digital data files of Architect's CAD drawings will be provided by Architect for Contractor's use during construction.
 1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project record Drawings.
 2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
 3. Digital Drawing Software Program: Contract Drawings are available in AutoCad 2013.
 4. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual.
 - a. Subcontractors, and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement included in this Project Manual.
 5. At Contractor's written request, copies of Architect's Electronic CAD files will be provided to Contractor for Contractor's use in connection with the Project, subject to the following conditions:
 - a. Electronic CAD Files of Project Drawings may only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
 - b. The drawings cannot be used for any other project.
 - c. The Architect's title block must be removed by the Contractor. The Contractor becomes responsible for the content of the drawings.
 - 1) User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
 - d. Use of files is solely at receiver's risk. Architect does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect of discrepancy and use information in hard-copy Drawings and Specifications.
 - 1) CAD files may not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 - 2) Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.

- 3) Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
- 4) Receiver shall not hold Architect/Engineer responsible for such viruses or their consequences, and shall hold Architect/Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

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

1.9 PROJECT MEETINGS

- A. General: The Construction Manager will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
- B. Preconstruction Conference: The Owner will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect.
1. Minutes: The Construction Manager will be responsible for the meeting minutes and will record and distribute to all parties.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.

- p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: The Construction Manager will conduct progress meetings at monthly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner, Agency, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Status of sustainable design documentation.
 - 6) Deliveries.
 - 7) Off-site fabrication.
 - 8) Access.
 - 9) Site use.
 - 10) Temporary facilities and controls.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of correction of deficient items.

- 14) Field observations.
 - 15) Status of RFIs.
 - 16) Status of Proposal Requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) As-Built Updates.
 - 20) Pending claims and disputes.
 - 21) Documentation of information for payment requests.
4. Minutes: **Construction Manager** responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Submittal schedule requirements.
 - 2. Administrative and procedural requirements for submittals.

1.2 SUBMITTAL SCHEDULE

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

1.3 SUBMITTAL PROCEDURES

- A. All submittals will be submitted to the Construction Manager for review. Construction Manager will then transmit the submittal to the architect for approval.
- B. Transmit each submittal with AIA G810 - Transmittal Letter or Contractor similar form.
- C. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- D. Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 - 3. Include the following information on label for processing and recording action taken:
 - a. Project name
 - b. Owner's Project Number
 - c. Date
 - d. Name and address of Architect
 - e. Name and address of Contractor
 - f. Name and address of subcontractor, if any
 - g. Name and address of supplier
 - h. Name and address of Manufacturer
 - i. Unique identifier, including revision number
 - j. Number and title of appropriate Specification Section
 - k. Drawing number and detail references, as appropriate
 - l. Other necessary identification

- E. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents
- F. Transmit each package with transmittal form individually and appropriately for transmittal and handling.
 - 1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations.
 - a. Include the same label information as the related submittal.
 - 2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents
 - 3. Provide locations on transmittal form for the following information.
 - a. Project Name
 - b. Owner's Project Number
 - c. Date
 - d. Destination (To :)
 - e. Source (From :)
 - f. Names of subcontractor, manufacturer, and supplier
 - g. Category and type of submittal
 - h. Submittal purpose and description
 - i. Submittal and transmittal distribution record
 - j. Remarks
 - k. Signature of transmitter
- G. Schedule submittals to expedite Project and coordinate submission of related items.
 - 1. For each submittal for review, allow 10 days excluding delivery time to and from Contractor.
- H. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- I. Allow space on submittals for Contractor and Architect review stamps.
- J. When revised for resubmission, identify changes made since previous submission.
- K. Distribute copies of reviewed submittals as appropriate
 - 1. Instruct parties to promptly report inability to comply with requirements.
- L. Submittals not requested will not be recognized nor processed.
- M. Complete submittals for each item are required.
- N. Incomplete Submittals:
 - 1. Architect/Engineer will not review.
 - 2. Delays resulting from incomplete submittals are not the responsibility of Architect.
- O. Architect will not review submittal:
 - 1. Received from sources other than Construction Manager
 - 2. Without General Contractor's reviewed stamp
 - 3. Without a completed transmittal form
 - 4. Instruct parties to promptly report inability to comply with requirements.
- P. Use only final submittals with mark indicating action taken by Architect in connection with construction.

1.2 ELECTRONIC SUBMITTAL PROCEDURES

- A. At Contractor's written request, the use of electronic submittals may be approved by the architect.
- B. All submittals will be submitted to the Construction Manager for review. Construction Manager will then transmit the submittal to the architect for approval. Submit each submittal in PDF format.
- C. Transmit each submittal with electronic equivalent of AIA Form G810
 1. Allow space on submittals for Contractor's review and approval markings.
 2. Allow space on submittals for Contractor and Architect/Engineer review stamps.
 3. Include the following information for processing and recording action:
 - a. Name and address of General Contractor
 - b. Project name
 - c. Owner's/Architects Project Number
 - d. Date
 - e. Name and address of Architect
 - f. Name and address of Contractor
 - g. Name and address of subcontractor, if any
 - h. Name and address of supplier
 - i. Name and address of Manufacturer
 - j. Unique identifier, including revision number
 - k. Number and title of appropriate Specification Section
 - l. Drawing number and detail references, as appropriate
 - m. Other necessary identification
 - n. Indicate name of firm or entity that prepared each submittal.
- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.
- E. Transmit each package with transmittal form individually and appropriately for transmittal and handling.
- F. Complete submittals for each item are required.
- G. Incomplete Submittals:
 1. Architect/Engineer will not review.
 2. Delays resulting from incomplete submittals are not the responsibility of Architect.
- H. Use only final submittals with mark indicating action taken by Architect in connection with construction.
- I. Architect will not review submittal:
 1. Received from sources other than General Contractor
 2. Without General Contractor's reviewed stamp
 3. Without a completed transmittal form
 4. Not in PDF format
- J. Schedule submittals to expedite Project and deliver to Architect at business address. Coordinate submission of related items
 1. For each submittal for review, allow 10 days.
- K. Identify variations from Contract Documents and product or system limitations which

may be detrimental to successful performance of completed Work.

- L. When revised for resubmission, identify changes made since previous submission.
- M. Distribute copies of reviewed submittals as appropriate
 - 1. Instruct parties to promptly report inability to comply with requirements.
- N. Submittals not requested will not be recognized or processed.
- O. Use only final submittals with mark indicating action taken by Architect in connection with construction.
- P. Electronic submittals shall comply with the same requirements contain elsewhere in this section for paper submittals.

1.4 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Architect's digital data drawing files is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.

- d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
- C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.
- 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two (2) full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 - 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three (3) sets of Samples. Architect will retain one sample set; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

- 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
 5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
 6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- H. Test and Research Reports:
1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
 2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.5 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.6 ARCHITECT'S REVIEW

- A. Do not make "mass submittals" to Architect
 1. "Mass submittals" are defined as six or more submittals or items in one day or 15 or more submittals or items in one week
 2. If "mass submittals" are received, Architect's review time stated above will be extended as necessary to perform proper review
 3. Architect will review "mass submittals" based on priority determined by Architect after consultation with Owner and Contractor
- B. Architect will review each submittal, make marks to indicate corrections or modifications required, and return it.
 1. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.

- C. Informational submittals and other similar data are for Architect information, do not require Architect responsive action, and will not be reviewed or returned with comment.
- D. Submittals made by Contractor that are not required by Contract Documents will not be reviewed and may be discarded.
- E. Submittals approval does not authorize change to Contract requirements unless accompanied by Change Order or Architect's Supplemental Instructions.
- F. Architect will review submittals twice.
 - 1. All additional reviews shall be paid for by the Contractor at an established fee.
 - 2. Owner may withhold monies due to Contractor to cover additional costs beyond the second submittal review.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Fixed Price Construction Contract and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Design Professional, or Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by the Design Professional.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.

2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
 - E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
 - F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
 - G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
 - H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
 - I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
 - J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Design Professional for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Design Professional for a decision before proceeding.

1.5 ACTION SUBMITTALS

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

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Design Professional.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Design Professional.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 15 days of Notice to Proceed and not less than 2 days prior to preconstruction conference. Submit in format acceptable to Design Professional. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 - 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Design Professional has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and re-inspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of technical representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Statement that products at Project site comply with requirements.
 - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 6. Statement whether conditions, products, and installation will affect warranty.
 - 7. Other required items indicated in individual Specification Sections.

- C. **Factory-Authorized Service Representative's Reports:** Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of factory-authorized service representative making report.
 - 2. Statement that equipment complies with requirements.
 - 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 4. Statement whether conditions, products, and installation will affect warranty.
 - 5. Other required items indicated in individual Specification Sections.
- D. **Permits, Licenses, and Certificates:** For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

- A. **General:** Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. **Manufacturer Qualifications:** A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. **Fabricator Qualifications:** A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. **Installer Qualifications:** A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. **Professional Engineer Qualifications:** A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. **Specialists:** Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. **Testing Agency Qualifications:** An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. **NRTL:** A nationally recognized testing laboratory according to 29 CFR 1910.7.

2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
 - I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
 - J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mock-ups; do not reuse products on Project unless authorized by the Design Professional.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Design Professional and Commissioning Authority with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services. These services, or special inspections, provided to the Owner are for the express purpose of meeting the testing requirements required under the authorities having jurisdiction and shall not in any way be considered to replace the Contractor's responsibility for quality assurance and control for the project.
 1. Contractor will coordinate and schedule all testing and special inspections with the Owner's testing agency.
 2. Under no circumstances will the Owner's testing agency perform quality control or quality assurance work for the Contractor.
 3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
 4. Initial reports (handwritten as a minimum) will be given to the Contractor by the Owner's testing Agency before leaving the site the day of the inspection.
 5. Final reports will be issued later to the Contractor, Design Professional, and Owner.

- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 - 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in pre-installation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Owner, Design Professional, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Owner, Design Professional, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service to Owner, Design Professional, and Contractor.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - 6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.

2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Design Professional, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner as follows:
1. Schedule of Special Inspections by Owner: See individual specification sections for specific requirements.
- B. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Owner, Design Professional, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Owner, Design Professional, and Contractor, and to authorities having jurisdiction if required.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retesting and re-inspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Owner and Design Professional's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Agency will pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Agency will pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Agency will pay electric-power-service use charges for electricity used by all entities for construction operations.
- E. Water and Sewer Service from Existing System: Water from Agency's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- F. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. HVAC system isolation schematic drawing.
 - 3. Location of proposed air-filtration system discharge.
 - 4. Waste-handling procedures.
 - 5. Other dust-control measures.
 - 6. Noise control measures.

1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.5 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 EQUIPMENT

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

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

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

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

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

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

- E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 - 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.

- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

- G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service overhead unless otherwise indicated.

- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.4 SUPPORT FACILITIES INSTALLATION

- A. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.

- B. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

- C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
- D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- E. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.
- F. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- D. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- E. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
 - 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
 - 2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.

3. Provide walk-off mats at each entrance through temporary partition.
- F. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 3. Indicate methods to be used to avoid trapping water in finished work.
- B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard and replace stored or installed material that begins to grow mold.

7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 01 25 00 "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved by Architect through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

- A. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify basis-of-design product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within seven (7) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
 - a. Form of Architect's Approval of Submittal: As specified in Section 01 33 00 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

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

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

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

B. Delivery and Handling:

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

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.

4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole product may be indicated by the phrase: "Subject to compliance with requirements, provide the following: ..."
2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole manufacturer/source may be indicated by the phrase: "Subject to compliance with requirements, provide products by the following: ..."
3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - a. Limited list of products may be indicated by the phrase: "Subject to compliance with requirements, provide one of the following: ..."
4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, which complies with requirements.
 - a. Non-limited list of products is indicated by the phrase: "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following: ..."
5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - a. Limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, provide products by one of the following: ..."
6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, which complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following: ..."
7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.

Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- a. For approval of products by unnamed manufacturers, comply with requirements in Section 01 25 00 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 2. Evidence that proposed product provides specified warranty.
 3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 4. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 73 00

EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Quality Assurance.
2. Materials.
3. Examination.
4. Preparation.
5. Construction layout.
6. Field engineering and surveying.
7. Installation of the Work.
8. Cutting and patching.
9. Progress cleaning.
10. Starting and adjusting.
11. Protection of installed construction.

- B. Related Requirements:

1. Section 01 10 00 "Summary" for limits on use of Project site.
2. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.

1.2 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

- a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
- 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
 - 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
 - 6. Dates: Indicate on the contractor's schedule when cutting and patching will be performed.
- B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
 - C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework,

investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services; and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

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

3.2 PREPARATION

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

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

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

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

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

- B. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- C. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of in occupied spaces and in unoccupied spaces, or as required by authorities having jurisdiction.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Remove and replace damaged, defective, or non-conforming Work.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 AGENCY-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's and Agency construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner and Agency construction personnel.
 1. Construction Schedule: Inform Owner/Agency of Contractor's preferred construction schedule for Owner/Agency portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner/Agency in a timely manner if changes to schedule are required due to differences in actual construction progress.

2. Preinstallation Conferences: Include Owner/Agency construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner/Agency work. Attend preinstallation conferences conducted by Owner/Agency construction personnel if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

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

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Drawings and general provisions of the Contract, including Fixed Price Construction Contract and other Division 01 Specification Sections, apply to this Section.
- B. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- C. Related Requirements:
 - 1. Section 01 78 23 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 2. Section 01 79 00 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.2 ACTION SUBMITTALS

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

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Idaho Division of Public Works Close-Out requirements. The "Project Finalization" form is required unless specifications indicate otherwise.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of seven (7) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
 5. Submit sustainable design submittals not previously submitted.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 7. A final report of Special Inspections to be attached to the Substantial Completion. If no Special Inspections are required, Design Professional can initial as such on the Substantial Completion form.
 8. Submit O&M Manuals for compliance with the contract documents.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of seven (7) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
 6. Advise Owner of changeover in utility services.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements.
 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of ten (10) days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for final completion.

1.5 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 1. Submit final Application for Payment according to Section 01 29 00 "Payment Procedures".
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Idaho Division of Public Works Close-Out requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will approve/initial punch list after inspection or will notify Contractor of construction that must be completed or corrected before final documents will be signed.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 1. Organize list of spaces in sequential order.
 2. Retain the subparagraph below if default submittal format in Section 01 33 00 "Submittal Procedures" is not appropriate.
 3. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect will return annotated file.
 - b. PDF electronic file. Architect will return annotated file.

1.7 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within ten (10) days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

1. Submit on digital media acceptable to Architect.
- E. Warranties in Paper Form:
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- F. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.

- e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations, as well as any damage to surrounding areas. Repair includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition before requesting inspection for determination of Substantial Completion.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

B. Repair, or remove and replace, defective construction.

END OF SECTION

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Closeout Submittals
 - 2. Operation and maintenance documentation directory manuals.
 - 3. Emergency manuals.
 - 4. Systems and equipment operation manuals.
 - 5. Systems and equipment maintenance manuals.
 - 6. Product maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect and Agency will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit on digital media acceptable to Architect.
 - 2. Submit three paper copies. Architect will return two copies.
- C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 7 (seven) days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
- D. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.3 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.

2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 2. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.4 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.5 EMERGENCY MANUALS

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

1.6 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.

2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed and identify color coding where required for identification.

1.7 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds, as described below.

- C. **Manufacturers' Maintenance Documentation:** Include the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
 - D. **Maintenance Procedures:** Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
 - E. **Maintenance and Service Schedules:** Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - F. **Spare Parts List and Source Information:** Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
 - G. **Warranties and Bonds:** Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.
 - H. **Drawings:** Prepare drawings supplementing manufacturers printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
- 1.8 **PRODUCT MAINTENANCE MANUALS**
- A. **Product Maintenance Manual:** Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
 - B. **Content:** Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
 - C. **Product Information:** Include the following, as applicable:

1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.

- B. Related Requirements:
 - 1. Section 01 73 00 "Execution"
 - 2. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit one paper-copy set of marked-up record prints.
 - 2) Architect will review for completeness.

- B. Record Specifications: Submit one paper copy annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

- C. Record Product Data: Submit one paper copy annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

1.3 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper or electronic copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

- b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 2. Format: DWG, Version , Microsoft Windows operating system.
 3. Format: Annotated PDF electronic file with comment function enabled.
 4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 5. Refer instances of uncertainty to Architect for resolution.
 6. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 01 31 00 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. If required, bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.

4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

1.4 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy or scanned PDF electronic file(s) of marked-up paper copy of Specifications.

1.5 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- C. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.
 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

1.6 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store record documents in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION

SECTION 01 79 00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 INFORMATIONAL SUBMITTALS

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

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit one copy (1) within seven (7) days of end of each training module.
 - 1. At completion of training, submit complete training manual(s) for Owner's use prepared in same format required for operation and maintenance manuals specified in Section 01 78 23 "Operation and Maintenance Data."

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Preconstruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination."

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.6 INSTRUCTION PROGRAM

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

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

1.7 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.8 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner with at least ten (10) days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Cleanup: Collect used and leftover educational materials and remove from Project. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.9 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Digital Video Recordings: Provide high-resolution, digital video.
 - 1. Submit video recordings on USB thumb drive.
- C. Recording: Display continuous running time.
- D. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION

STATE OF IDAHO
Idaho Transportation Department
Training Confirmation Sign-In Sheet

Project Name: _____

Project Location: _____

Representative: _____

Date & time: _____

Name	Company	E-mail	Telephone	Signature

PROJECT FINALIZATION AND START-UP

Upon completion of the equipment and systems installation and connections, the contractor shall assemble all equipment factory representative and subcontractors together for system start-up.

These people shall assist in start-up and check out their system(s) and remain at the site until the total system operation is acceptable and understood by the agency's representative(s). The factory representative and system subcontractor shall also give instructions on operation and maintenance of their equipment to the agency's maintenance and/or operation personnel. To prove acceptance of operation and instruction by the agency's representative(s), this written statement of acceptance shall be signed below.

"I, the Contractor, associated factory representative and subcontractors, have started each system and the total system; and have proven their normal operation to the agency's representative(s) and maintenance/operation personnel and have instructed him/them in the operation and maintenance thereof."

Agency's Representative

Contractor

Signature

Signature

Date

Date

Copyright Release Agreement

Project: ITD D6 Maintenance Bldg. Extension & Renovation, Challis, ID

Myers Anderson Architects Project Number: 25684

In response to the Contractor's (Sub-Contractor's) request to obtain electronic copies of portions of the copyrighted documents produced by Myers Anderson Architects, PLLC for the above referenced project, Myers Anderson Architects, PLLC agrees to provide such electronic reproductions with the following conditions:

Contractor (Sub-Contractor) to initial each condition in the space provided.

- _____ 1. These electronically reproduced document copies are only for the use of this Contractor (Sub-Contractor); and only as an aid in the production of this Contractor's (Sub-Contractor's) portion of the Work.
- _____ 2. All title blocks and other references to Myers Anderson Architects, PLLC, the Architect of Record, the Consultant(s), and the Owner shall be removed.
- _____ 3. This Contractor (Sub-Contractor) shall remove all notes, text, and detail cuts from the electronic file prior to use.
- _____ 4. This Contractor (Sub-Contractor) agrees to the following indemnity clause:

In consideration of the Contractor's (Sub-Contractor's) use of Architect's copyrighted electronic file documents, the Contractor (Sub-Contractor) agrees that it shall make no claim against Myers Anderson Architects, PLLC and shall further hold harmless, indemnify, and defend Myer Anderson Architects, PLLC from and against any and all claims, costs and expenses resulting from the Contractor's (Sub-Contractor's) use of Architect's copyrighted electronic file documents contained therein.

Contractor (Sub-contractor) Company: _____

Officer & Title (Printed): _____

Officer & Title (Signed): _____

Date: _____

Myers Anderson Architects, PLLC

Representative & Title (Printed): _____

Representative & Title (Signed): _____

Date: _____

REQUEST FOR INTERPRETATION

R.F.I. No: _____

To: _____

Date: _____

Project Name: _____

Regarding: _____

Contract For: _____

From: _____

Project No: _____

Specification Section

Paragraph

Drawing No

Detail

Request:

Signed by: _____

Date: _____

Response:

Signed by: _____

Date: _____

Date Rec'd:

Date Ret'd:

Attachments

Copies: Architect

Contractor

Consultant

Owner

Others

SUBSTITUTION REQUEST

(During the Bidding Phase)

Project: _____ _____	Substitution Request Number: _____
To: _____ _____	From: _____
Re: _____ _____	Date: _____
	A/E Project Number: _____
	Contract For: _____

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

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01 33 00.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01 33 00.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

Supporting Data Attached Drawings Product Data Samples Tests Reports _____

DIVISION 02 EXISTING CONDITIONS

SECTION 02 41 19

SELECTIVE STRUCTURE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolishing designated building equipment and fixtures.
 - 2. Demolishing designated construction.
 - 3. Cutting and alterations for completion of the Work.
 - 4. Removing designated items for reuse and Owner's retention.
 - 5. Protecting items designated to remain.
 - 6. Removing demolished materials.

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Demolition Schedule: Indicate overall schedule and interruptions required for utility and building services.
- C. Shop Drawings:
 - 1. Indicate demolition and removal sequence.
 - 2. Indicate location of items designated for reuse and Owner's retention.
 - 3. Indicate location and construction of temporary work.

1.3 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures: Requirements for submittals.
- B. Project Record Documents: Accurately record actual locations of capped utilities, concealed utilities discovered during demolition, and subsurface obstructions.

1.4 QUALITY ASSURANCE

- A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection.
- B. Conform to applicable code for procedures when hazardous or contaminated materials are discovered.
- C. Obtain required permits from authorities having jurisdiction.

1.5 PRE-INSTALLATION MEETINGS

- A. Section 01 31 00 - Project Management and Coordination: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.6 SEQUENCING

- A. Section 01 10 00 - Summary: Requirements for sequencing.
- B. Owner will conduct salvage operations before demolition begins to remove materials Owner chooses to retain.

1.7 SCHEDULING

- A. Section 01 31 00 - Project Management and Coordination: Requirements for scheduling.

- B. Schedule Work to coincide with new construction.
- C. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation and in adjoining spaces.
- D. Perform noisy work:
 - 1. Between hours of 8:00 am and 5:00 pm.
 - 2. On following days: Monday through Saturday.
- E. Coordinate utility and building service interruptions with Owner.
 - 1. Do not disable or disrupt building fire or life safety systems without three days prior written notice to Owner.
 - 2. Schedule tie-ins to existing systems to minimize disruption.
 - 3. Coordinate Work to ensure fire sprinklers, fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.8 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Cease operations immediately if the structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

PART 2 PRODUCTS Not Used.

PART 3 EXECUTION

3.1 PREPARATION

- A. Notify affected utility companies before starting work and comply with their requirements.
- B. Mark location and termination of utilities.
- C. Erect, and maintain temporary barriers and security devices, including warning signs and lights, and similar measures, for protection of the public, Owner, and existing improvements indicated to remain.
- D. Erect and maintain weatherproof closures for exterior openings.
- E. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued Owner occupancy.
- F. Prevent movement of structure; provide temporary bracing and shoring required to ensure safety of existing structure.
- G. Provide appropriate temporary signage including signage for exit or building egress.
- H. Do not close or obstruct the building egress path.
- I. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

3.2 SALVAGE REQUIREMENTS

- A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner.
- B. Tag components and equipment Owner designates for salvage.
- C. Protect designated salvage items from demolition operations until items can be removed.

- D. Carefully remove building components and equipment indicated to be salvaged.
- E. Disassemble as required to permit removal from building.
- F. Package small and loose parts to avoid loss.
- G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.
- H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.
- I. Deliver salvaged items to Owner. Obtain signed receipt from Owner.

3.3 DEMOLITION

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Maintain protected egress from and access to adjacent existing buildings at all times.
- C. Do not close or obstruct roadways and sidewalks without permits.
- D. Cease operations immediately when the structure appears to be in danger and notify Architect.
- E. Disconnect and remove designated utilities within demolition areas.
- F. Cap and identify abandoned utilities at termination points when utility is not completely removed. Annotate Record Drawings indicating location and type of service for capped utilities remaining after demolition.
- G. Demolish in orderly and careful manner. Protect existing improvements, supporting structural members.
- H. Carefully remove building components indicated to be reused.
 - 1. Disassemble components as required to permit removal.
 - 2. Package small and loose parts to avoid loss.
 - 3. Mark components and packaged parts to permit reinstallation.
 - 4. Store components, protected from construction operations, until reinstalled.
- I. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
- J. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.
- K. Remove temporary Work.
- L. Patch back and repair any existing surfaces called out to remain as if damaged during demolition.
- M. Patch back and tie into existing surfaces to match adjacent surfaces.

END OF DIVISION

DIVISION 03 CONCRETE

SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Formwork for cast-in place concrete
 - 2. Shoring, bracing, and anchorage
 - 3. Form accessories
 - 4. Form stripping
- B. Related Sections:
 - 1. Section 03 20 00 - Concrete Reinforcing
 - 2. Section 03 30 00 - Cast-In-Place Concrete
 - 3. Section 05 50 00 - Metal Fabrications: Product requirements for metal fabrications for placement by this Section

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials
 - 2. ACI 301 - Specifications for Structural Concrete
 - 3. ACI 318 - Building Code Requirements for Structural Concrete
 - 4. ACI 347 - Guide to Formwork for Concrete

1.3 DESIGN REQUIREMENTS

- A. Design, engineer and construct formwork, shoring and bracing in accordance with ACI 318 to conform to design and applicable code requirements to achieve concrete shape, line and dimension as indicated on Drawings

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 347, ACI 301, and ACI 318

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Products storage and handling requirements
- B. Deliver void forms and installation instructions in manufacturer's packaging
- C. Store off ground in ventilated and protected manner to prevent deterioration from moisture

1.6 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination.
- B. Coordinate this Section with other sections of work, requiring attachment of components to formwork

PART 2 - PRODUCTS

2.1 WOOD FORM MATERIALS

- A. Plywood: Douglas Fir species; select sheathing, tight face select sheathing grade; sound undamaged sheets with clean, true edges
- B. Lumber Forms:
 - 1. Application: Use for edge forms and unexposed finish concrete
 - 2. Boards: 6 inches or 8 inches in width, ship lapped, or tongue and groove, "Standard" Grade Douglas Fir, conforming to WCLIB Standard Grading Rules for West Coast Lumber
 - 3. Surface boards on four sides
- C. Plywood Forms:
 - 1. Application: Use for exposed finish concrete
 - 2. Forms: Conform to PS 1; full size 4 x 8 feet panels; each panel labeled with grade trademark of APA/EWA
 - 3. Plywood for Surfaces to Receive Membrane Waterproofing: Minimum of 5/8 inch thick; APA/EWA "B-B Plyform Structural I Exterior" grade
 - 4. Plywood where "Smooth Finish" is required, as indicated on Drawings: APA/EWA "HD Overlay Plyform Structural I Exterior" grade, minimum of 3/4 inch thick

2.2 PREFABRICATED FORMS

- A. Manufacturers:
 - 1. EFCO - Economy Forms Corp
 - 2. Sonoco Products Co
 - 3. Symons by Dayton Superior
 - 4. Wall-Ties & Forms, Inc
 - 5. Western Forms.
 - 6. Substitutions: Section 01 60 00 - Product Requirements
- B. Preformed Steel Forms: Minimum 16 gage matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces
- C. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces
- D. Steel Forms: Sheet steel, suitably reinforced, and designed for particular use indicated on Drawings
- E. Form Liners: Smooth, durable, grainless and non-staining hardboard, unless otherwise indicated on Drawings
- F. Framing, Studding and Bracing: Stud or No 3 structural light framing grade

2.3 FORMWORK ACCESSORIES

- A. Form Ties: Snap-off type, galvanized metal, fixed length, cone type, free of defects capable of leaving holes larger than 1 inch in concrete surface
 - 1. Manufacturers:
 - a. Heckmann Building Products, Inc
 - b. Symons by Dayton Superior
 - c. Wall-Ties & Forms, Inc
 - d. Substitutions: Section 01 60 00 - Product Requirements
- B. Spreaders: Standard, non-corrosive metal form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face

1. Wire ties, wood spreaders or through bolts are not permitted
- C. Form Anchors and Hangers:
 1. Do not use anchors and hangers exposed concrete leaving exposed metal at concrete surface
 2. Symmetrically arrange hangers supporting forms from structural steel members to minimize twisting or rotation of member
 3. Penetration of structural steel members is not permitted
- D. Form Release Agent: Colorless mineral oil that will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete
 1. Manufacturers:
 - a. Architectural Concrete Chemicals, LLC
 - b. Nox-Crete Products Group
 - c. Substitutions: Section 01 60 00 - Product Requirements
- E. Bituminous Joint Filler: ASTM D1751
- F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength and character to maintain formwork in place while placing concrete

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 Execution: Coordination and project conditions
- B. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with Drawings
- C. When formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Architect

3.2 INSTALLATION

- A. Earth Forms:
 1. Earth forms are not permitted
- B. Formwork - General:
 1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted
 2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations
 3. Camber forms where necessary to produce level finished soffits unless otherwise shown on Drawings
 4. Carefully verify horizontal and vertical positions of forms
 - a. Correct misaligned or misplaced forms before placing concrete
 5. Complete wedging and bracing before placing concrete
- C. Forms for Smooth Finish Concrete:
 1. Use steel, plywood or lined board forms
 2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish
 3. Use care in forming and stripping wood forms to protect corners and edges
 4. Level and continue horizontal joints
 5. Keep wood forms wet until stripped

- D. Framing, Studding and Bracing:
 1. Space studs at 16 inches on center maximum for boards and 12 inches on center maximum for plywood
 2. Size framing, bracing, centering, and supporting members with sufficient strength to maintain shape and position under imposed loads from construction operations
 3. Construct beam soffits of material minimum of 2 inches thick
 4. Distribute bracing loads over base area on which bracing is erected
 5. When placed on ground, protect against undermining, settlement or accidental impact
- E. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301 and ACI 318
- F. Arrange and assemble formwork to permit dismantling and stripping
 1. Do not damage concrete during stripping
 2. Permit removal of remaining principal shores
- G. Obtain Architect 's approval before framing openings in structural members not indicated on Drawings
- H. Install void forms in accordance with manufacturer's recommendations
- I. Do not reuse wood formwork for concrete surfaces to be exposed to view
 1. Do not patch formwork

3.3 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items
- C. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent
 1. Soak inside surfaces of untreated forms with clean water
 2. Keep surfaces coated prior to placement of concrete
- D. Reuse and Coating of Forms:
 1. Thoroughly clean forms and reapply form coating before each reuse
 2. For exposed work, do not reuse forms with damaged faces or edges
 3. Apply form coating to forms in accordance with manufacturer's specifications
 4. Do not coat forms for concrete indicated to receive "scored finish"
 5. Apply form coatings before placing reinforcing steel

3.4 INSTALLATION - INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Install formed openings for items to be embedded in or passing through concrete work
- B. Locate and set in place items required to be cast directly into concrete
- C. Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work
- D. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain
- E. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces
- F. Form Ties:
 1. Use sufficient strength and sufficient quantity to prevent spreading of forms
 2. Place ties at least 1 inch away from finished surface of concrete
 3. Leave inner rods in concrete when forms are stripped
 4. Space form ties equidistant, symmetrical and aligned vertically and horizontally

unless otherwise shown on Drawings

- G. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete
- H. Construction Joints:
 - 1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints
 - 2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage
 - 3. Show no overlapping of construction joints
 - 4. Construct joints to present same appearance as butted plywood joints
 - 5. Arrange joints in continuous line straight, true and sharp
- I. Embedded Items:
 - 1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features
 - 2. Do not embed wood or uncoated aluminum in concrete
 - 3. Obtain installation and setting information for embedded items furnished under other Specification sections
 - 4. Securely anchor embedded items in correct location and alignment prior to placing concrete
 - 5. Verify conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 for size and location limitations
- J. Openings for Items Passing Through Concrete:
 - 1. Frame openings in concrete where indicated on Drawings
 - 2. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections
 - 3. Coordinate work to avoid cutting and patching of concrete after placement
 - 4. Perform cutting and repairing of concrete required as result of failure to provide required openings
- K. Screeds:
 - 1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs
 - 2. Slope slabs to drain where required or as shown on Drawings
 - 3. Before depositing concrete:
 - a. Remove debris from space to be occupied by concrete and thoroughly wet forms
 - b. Remove freestanding water
- L. Screed Supports:
 - 1. For concrete over waterproof membranes and vapor retarder membranes, use cradle, pad or base type screed supports which will not puncture membrane
 - 2. Staking through membrane is not be permitted
- M. Cleanouts and Access Panels:
 - 1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris and waste material
 - 2. Clean forms and surfaces against which concrete is to be placed
 - a. Remove chips, saw dust and other debris
 - b. Thoroughly blow out forms with compressed air just before concrete is placed

3.5 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms
- B. Clean formed cavities of debris prior to placing concrete

- C. Flush with water or use compressed air to remove remaining foreign matter
 - 1. Ensure that water and debris drain to exterior through clean-out ports
- D. During cold weather:
 - 1. Remove ice and snow from within forms
 - 2. Do not use de-icing salts
 - 3. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure
 - 4. Use compressed air or other means to remove foreign matter

3.6 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads and removal has been approved by Architect
- B. Loosen forms carefully
 - 1. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view
- C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged
 - 1. Discard damaged forms
- D. Leave forms in place for minimum number of days as specified in ACI 347

3.7 ERECTION TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 301 and ACI 318

3.8 FIELD QUALITY CONTROL

- A. Section: Field inspecting, testing, adjusting, and balancing.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure
- C. Notify Architect after placement of reinforcing steel in forms, but prior to placing concrete
- D. Schedule concrete placement to permit formwork inspection before placing concrete

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Reinforcing bars
 - 2. Welded wire fabric
 - 3. Reinforcement accessories
- B. Related Sections:
 - 1. Section 03 10 00 - Concrete Forming and Accessories
 - 2. Section 03 30 00 - Cast-In-Place Concrete
 - 3. Section 03 35 00 - Concrete Finishing: Reinforcement for concrete floor toppings

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete
 - 2. ACI 318 - Building Code Requirements for Structural Concrete
 - 3. ACI 530.1 - Specifications for Masonry Structures
 - 4. ACI SP-66 - ACI Detailing Manual
- B. ASTM International:
 - 1. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
 - 2. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
 - 3. A185/A185M-07 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
 - 4. ASTM A496/A496M - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement
 - 5. ASTM A497/A497M - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
 - 6. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- C. American Welding Society:
 - 1. AWS D1.4 - Structural Welding Code - Reinforcing Steel
- D. Concrete Reinforcing Steel Institute:
 - 1. CRSI - Manual of Standard Practice
 - 2. CRSI - Placing Reinforcing Bars

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Shop Drawings: Indicate bar sizes, spacing, locations, and quantities of reinforcing steel and welded wire fabric, bending and cutting schedules, and supporting and spacing devices
- C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements
 - 1. Submit certified copies of mill test report of reinforcement materials analysis

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with CRSI - Manual of Standard Practice, ACI 301 and ACI 318
- B. Prepare shop drawings in accordance with ACI SP-66

1.5 QUALIFICATIONS

- A. Welders: AWS qualified within previous 12 months

1.6 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination
- B. Coordinate with placement of formwork, formed openings and other Work

PART 2 - PRODUCTS

2.1 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish
- B. Plain Wire: ASTM A82/A82M; unfinished

2.2 ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16 gage annealed type
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions
- C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: type; size and shape to meet Project conditions

2.3 FABRICATION

- A. Fabricate concrete reinforcement in accordance with CRSI Manual of Practice, ACI 318 and applicable code
- B. Form standard hooks for stirrup and tie hooks, and seismic hooks as indicated on Drawings
- C. Form reinforcement bends with minimum diameters in accordance with ACI 318 and applicable code
- D. Fabricate column reinforcement with offset bends at reinforcement splices
- E. Weld reinforcement in accordance with AWS D1.4
- F. Locate reinforcement splices not indicated on Drawings, at point of minimum stress
 - 1. Review location of splices with Architect

PART 3 - EXECUTION

3.1 PLACEMENT

- A. Place, support and secure reinforcement against displacement
 - 1. Do not deviate from required position beyond specified tolerance
 - a. Do not weld crossing reinforcement bars for assembly except as permitted by Architect
- B. Do not displace or damage vapor retarder

- C. Accommodate placement of formed openings
- D. Space reinforcement bars with minimum clear spacing in accordance with ACI 318
 - 1. Where bars are indicated in multiple layers, place upper bars directly above lower bars
- E. Maintain concrete cover around reinforcement as follows:

Reinforcement Location		Minimum Concrete Cover
Footings and Concrete Formed Against Earth		3 inches
Concrete exposed to earth or weather	No. 6 bars and larger	2 inches
	No. 5 bars and smaller	1-1/2 inches

- F. Splice reinforcing where indicated on Drawings in accordance with splicing device manufacturer's instructions

3.2 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances

3.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing
- B. Perform field inspection and testing in accordance with ACI 318
- C. Provide free access to Work and cooperate with appointed firm
- D. Reinforcement Inspection:
 - 1. Placement Acceptance: Specified and ACI 318 material requirements and specified placement tolerances
 - 2. Welding: Inspect welds in accordance with AWS D1.1
 - 3. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing
 - 4. Weldability Inspection: Inspect for reinforcement weldability when formed from steel other than ASTM A706/A706M
 - 5. Periodic Weld Inspection: Other welded connections

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete for the following:
 - 1. Foundation walls
 - 2. Slabs on grade
 - 3. Control, expansion and contraction joint devices
 - 4. Equipment pads
 - 5. Light pole base
 - 6. Thrust blocks
 - 7. Manholes
- B. Related Sections:
 - 1. Section 03 10 00 - Concrete Forming and Accessories: Formwork and accessories Placement of joint device, and joint device anchors in formwork
 - 2. Section 03 20 00 - Concrete Reinforcing
 - 3. Section 03 35 00 - Concrete Finishing
 - 4. Section 03 39 00 - Concrete Curing
 - 5. Section 07 90 00 - Joint Protection

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete
 - 2. ACI 305 - Hot Weather Concreting
 - 3. ACI 306.1 - Standard Specification for Cold Weather Concreting
 - 4. ACI 308.1 - Standard Specification for Curing Concrete
 - 5. ACI 318 - Building Code Requirements for Structural Concrete
- B. ASTM International:
 - 1. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field
 - 2. ASTM C33 - Standard Specification for Concrete Aggregates
 - 3. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 - 4. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete
 - 5. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete
 - 6. ASTM C150 - Standard Specification for Portland Cement
 - 7. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete
 - 8. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
 - 9. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
 - 10. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete
 - 11. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete
 - 12. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete
 - 13. ASTM C595 - Standard Specification for Blended Hydraulic Cements
 - 14. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
 - 15. ASTM C685/C685M - Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing

16. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
17. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
18. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
19. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
20. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
21. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials
22. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials
23. ASTM E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs
24. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs

1.3 PERFORMANCE REQUIREMENTS

- A. Vapor Retarder Permeance: Maximum 1 perm when tested in accordance with ASTM E96/E96M

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit data on joint devices, attachment accessories, and admixtures
- C. Design Data:
 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work
 - b. Air entrained concrete work
 2. Identify mix ingredients and proportions, including admixtures

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures
- B. Project Record Documents: Accurately record actual locations of embedded utilities and components concealed from view in finished construction

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301
- B. Conform to ACI 305 when concreting during hot weather
- C. Conform to ACI 306.1 when concreting during cold weather
- D. Acquire cement and aggregate from one source for Work

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site
- B. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days

1.8 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination
- B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type II - Moderate Portland type; Normal Weight Aggregates: ASTM C33
- B. Aggregate: Maximum size in accordance with ACI 318
- C. Water: ACI 318; potable

2.2 ADMIXTURES

- A. Manufacturers:
 - 1. Euclid Chemical Company
 - 2. GPC Applied Technologies
 - 3. Green Umbrella
 - 4. Sika Corporation
 - 5. Substitutions: Section 01 60 00 - Product Requirements
- B. Air Entrainment: ASTM C260
- C. Chemical: Not allowed without prior written approval from the Architect
- D. Fly Ash or Calcined Pozzolan: ASTM C618; Not allowed without prior written approval from the Architect
- E. Silica Fume: ASTM C1240
- F. Plasticizing: ASTM C1017/C1017M; Not allowed without prior written approval from the Architect

2.3 ACCESSORIES

- A. Bonding Agent: polysulfide polymer epoxy
 - 1. Manufacturers:
 - a. Euclid Chemical Company
 - b. QUIKRETE
 - c. Sika Corporation
 - d. W.R. Meadows, Inc
 - e. Substitutions: Section 01 60 00 - Product Requirements
- B. Vapor Retarder: ASTM E1745 Class A; 15 mil thick clear polyethylene film fabric reinforced plastic film; type recommended for below grade application
 - 1. Furnish joint tape recommended by manufacturer.
 - 2. Manufacturers:
 - a. GCP Applied Technologies - FLORPRUFE
 - b. Stego Industries, LLC
 - c. W.R. Meadows, Inc
 - d. Substitutions: Section 01 60 00 - Product Requirements

2.4 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler: ASTM D1751 or ASTM D994; Asphalt impregnated fiberboard or felt, 1/2 inch thick; tongue and groove profile

- B. Construction Joint Devices: Integral galvanized steel or extruded plastic; slab thickness, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge
- C. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric vinyl or neoprene filler strip with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery; extruded aluminum cover plate, of longest manufactured length at each location, flush or recessed mounted; color as selected
- D. Sealant and Primer: Type, as specified in Section 07 90 00

2.5 CONCRETE MIX

- A. Select proportions for concrete in accordance with ACI 318 field experience
- B. Provide concrete to the following criteria:
 - 1. All exposed exterior slab on grade, stem wall, columns, and beams

Material and Property	Measurement
Compressive Strength (28 day)	4500 psi
Cement Type	ASTM C150
Minimum Cement	6.0 sacks per cubic yard
Water-Cement Ratio (maximum)	0.45 by weight (mass)
Air Content (Do not use with towel finish)	5.5 percent plus or minus 1 percent
Slump	3 inches plus or minus 1 inch

- 2. All footings

Material and Property	Measurement
Compressive Strength (28 day)	3500 psi
Cement Type	ASTM C150
Minimum Cement	5.75 sacks per cubic yard
Water-Cement Ratio (maximum)	0.50 by weight (mass)
Air Content (Do not use with towel finish)	5.5 percent plus or minus 1 percent
Slump	4 inches plus or minus 1 inch

- 3. All Interior slab-on-grade

Material and Property	Measurement
Compressive Strength (28 day)	3500 psi
Cement Type	ASTM C150
Minimum Cement	5.0 sacks per cubic yard
Water-Cement Ratio (maximum)	0.45 by weight (mass)
Air Content (Do not use with towel finish)	0 percent plus or minus 1.5 percent

Slump	3 inches plus or minus 1 inch
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- C. Admixtures: Include admixture types and quantities indicated in concrete mix designs only when approved by Architect
 - 1. Use accelerating admixtures in cold weather. Use of admixtures will not relax cold weather placement requirements
 - 2. Do not use calcium chloride nor admixtures containing calcium chloride
 - 3. Use set retarding admixtures during hot weather
 - 4. Add air entrainment admixture to concrete mix for work exposed to freezing and thawing
 - 5. For concrete exposed to deicing chemicals, limit fly ash, pozzolans, silica fume, and slag content as required by applicable code
- D. Average Compressive Strength Reduction: Not permitted
- E. Ready Mixed Concrete: Mix and deliver concrete in accordance with ASTM C94/C94M

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution.
- B. Verify requirements for concrete cover over reinforcement
- C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates
- D. Remove water from areas receiving concrete before concrete is placed

3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301 and ACI 318.
- B. Notify testing laboratory and Architect a minimum 24 hours prior to commencement of operations
- C. Ensure reinforcement, inserts, embedded parts, formed 11expansion and contraction joints are not disturbed during concrete placement
- D. Install vapor retarder under interior slabs on grade in accordance with ASTM E1643
 - 1. Lap joints minimum 6 inches and seal watertight by adhesive applied between overlapping edges and ends or taping edges and ends
- E. Repair vapor retarder damaged during placement of concrete reinforcing
 - 1. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight
- F. Separate exterior slabs on grade from vertical surfaces with 1/2 inch thick joint filler
- G. Place joint filler in floor slab pattern placement sequence
 - 1. Set top to required elevations Secure to resist movement by wet concrete
- H. Extend joint filler from bottom of slab to within 1/4 inch of finished slab surface

1. Conform to Section 07 90 00 for finish joint sealer requirements
- I. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- J. Install joint device anchors
 1. Maintain correct position to allow joint cover to be flush with floor and/or wall finish
- K. Install joint covers in longest practical length, when adjacent construction activity is complete
- L. Apply sealants in joint devices in accordance with Section 07 90 00
- M. Deposit concrete at final position
 1. Prevent segregation of mix
- N. Place concrete in continuous operation for each panel or section determined by predetermined joints
- O. Consolidate concrete
- P. Maintain records of concrete placement
 1. Record date, location, quantity, air temperature, and test samples taken
- Q. Place concrete continuously between predetermined expansion, control, and construction joints
- R. Do not interrupt successive placement; do not permit cold joints to occur
- S. Place floor slabs in checkerboard or saw cut pattern indicated
- T. Saw cut joints within 12 hours after placing
 1. Contractor to provide saw-cut layout prior to placing concrete for review and approval by architect and engineer of record.
 2. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness
- U. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/8 inch in 10 ft

3.4 CONCRETE FINISHING

- A. Provide formed concrete surfaces to be left exposed concrete walls columns beams joists with sack rubbed finish
- B. Finish concrete floor surfaces to requirements of Section 03 35 00
- C. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/8 inch per foot nominal or as indicated on drawings
- D. Provide control joint or saw cut at grade break line where floor slopes to floor drain

3.5 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury
 1. Protect concrete footings from freezing for minimum 5 days
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete
- C. Cure concrete floor surfaces as specified in Section 03 39 00.

3.6 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing

- B. Perform field inspection and testing in accordance with ACI 318 and applicable code
- C. Provide free access to Work and cooperate with appointed firm
- D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work
- E. Concrete Inspections:
 - 1. Periodic Curing Inspection: Inspect for proper installation procedures, specified curing temperature and procedures
- F. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured
 - 3. Sample concrete and make one set of three cylinders for every 25 cu yds or less of each class of concrete placed each day and for every 100 cubic yards thereafter
 - 4. When volume of concrete for any class of concrete would provide less than 5 sets of cylinders, take samples from randomly selected batches
 - 5. Make one additional cylinder during cold weather concreting, and field cure
- G. Field Testing:
 - 1. Slump Test Method: ASTM C143/C143M
 - 2. Air Content Test Method: ASTM C173/C173M and ASTM C231
 - 3. Temperature Test Method: ASTM C1064/C1064M
 - 4. Measure slump and temperature for each compressive strength concrete sample
 - 5. Measure air content in air-entrained concrete for each compressive strength concrete sample
- H. Cylinder Compressive Strength Testing:
 - 1. Test Method: ASTM C39/C39M
 - 2. Test Acceptance: In accordance with ACI 318
 - 3. Test one cylinder at 7 days
 - 4. Test two cylinders at 28 days
 - 5. Dispose remaining cylinders when testing is not required
- I. Maintain records of concrete placement.
 - 1. Record date, location, quantity, air temperature, and test samples taken

3.7 PATCHING

- A. Allow Architect to inspect concrete surfaces immediately upon removal of forms
- B. Excessive honeycomb or embedded debris in concrete is not acceptable
 - 1. Notify Architect upon discovery
- C. Patch imperfections as directed by Architect

3.8 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements
- B. Repair or replacement of defective concrete will be determined by Architect
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area

3.9 SCHEDULE - CONCRETE TYPES

- A. Refer to Structural Drawings

END OF SECTION

SECTION 03 35 00

CONCRETE FINISHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Finishing concrete floors
 - 2. Floor surface treatment
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete: Prepared concrete floors ready to receive finish; control and formed expansion and contraction joints and joint devices
 - 2. Section 03 39 00 - Concrete Curing
 - 3. Section 07 90 00 - Joint Protection

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete
 - 2. ACI 302.1 - Guide for Concrete Floor and Slab Construction
- B. ASTM International:
 - 1. ASTM E1155 - Standard Test Method for Determining Floor Flatness and of Levelness Using the F-number System

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit data on concrete hardener, sealer, curing compounds, coatings, and slip resistant treatment, compatibilities, and limitations

1.4 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures
- B. Operation and Maintenance Data: Submit data on maintenance renewal of applied coatings

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 302.1

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience
- B. Applicator: Company specializing in performing work of this section with minimum three years documented experience and approved by the manufacturer

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements
- B. Deliver materials in manufacturer's packaging including application instructions

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site
- B. Temporary Lighting: Minimum 200 W light source, placed 8 feet above floor surface, for each 425 sq ft of floor being finished
- C. Do not finish floors until interior ambient temperature is above of 50 degrees F
- D. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete

1.9 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination
- B. Coordinate the Work with concrete floor placement and concrete floor curing

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers:
 - 1. Dayton Superior Corporation
 - 2. Euclid Chemical Company
 - 3. L&M Construction Chemicals, Inc
 - 4. W.R Meadows, Inc
 - 5. Sika
 - 6. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPOUNDS - HARDENERS AND SEALERS

- A. Curing: Type, as specified in Section 03 39 00
- B. Hardener: non-yellowing, liquid type
 - 1. Manufacturers:
 - a. Dayton Superior Corporation
 - b. Euclid Chemical Company
 - c. L&M Construction Chemicals, Inc
 - d. W.R Meadows, Inc
 - e. Substitutions: Section 01 60 00 - Product Requirements
- C. Stain Resistance Concrete Protection: non-yellowing sealer, resistance to chemicals, petroleum product, oils, and greases
 - 1. Manufacturers:
 - a. Sika – Sikagard 705L
 - b. Substitutions: Section 01 60 00 - Product Requirements

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution
- B. Verify floor surfaces are acceptable to receive the Work of this section

3.2 FLOOR FINISHING

- A. Cure concrete floor surfaces as specified in Section 03 39 00
- B. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1

- C. Steel trowel surfaces receiving carpeting, resilient flooring, seamless flooring, and thin set ceramic tile
- D. Steel trowel surfaces which are indicated to be exposed
- E. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains at 1/8 inch per foot nominal

3.3 FLOOR SURFACE TREATMENT

- A. Apply hardener on floor surfaces
- B. Apply sealer on floor surfaces

3.4 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances
- B. Maximum Variation of Surface Flatness For Exposed Concrete Floors: 1/8 inch in 10 ft
- C. Maximum Variation of Surface Flatness Under Seamless Resilient Flooring: 1/8 inch in 10 ft
- D. Maximum Variation of Surface Flatness Under Carpeting: 1/8 inch in 10 ft
- E. Correct defects in defined traffic floor by grinding or removal and replacement of defective Work
 - 1. Areas requiring corrective Work will be identified
 - 2. Re-measure corrected areas by same process

3.5 SCHEDULES

- A. Refer to Finish Schedule for floor finishes
- B. All interior and exterior horizontal and vertical exposed concrete surfaces

END OF SECTION

SECTION 03 39 00

CONCRETE CURING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes initial and final curing of horizontal and vertical concrete surfaces
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete
 - 2. Section 03 35 00 - Concrete Finishing

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete
 - 2. ACI 302.1 - Guide for Concrete Floor and Slab Construction
 - 3. ACI 308.1 - Standard Specification for Curing Concrete
 - 4. ACI 318 - Building Code Requirements for Structural Concrete
- B. ASTM International:
 - 1. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete
 - 2. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
 - 3. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete
 - 4. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit data on curing compounds, mats, paper, film, compatibilities, and limitations

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 30, ACI 302.1, and ACI 318

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements
- B. Deliver curing materials in manufacturer's packaging including application instructions

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Membrane Curing Compound Type B: ASTM C1315 Type I, Class A
 - 1. Manufacturers:
 - a. Dayton Superior Specialty Chemicals
 - b. Euclid Chemical Company L&M Construction Chemicals, Inc
 - c. W.R. Meadows, Inc
 - d. Nox-Crete Products Group
 - e. Substitutions: Section 01 60 00 - Product Requirements
- B. Non-Membrane Forming Curing Compound Type C: Liquid, penetrating silicate based type; combination curing, hardening and dust-proofing compound

1. Manufacturers:
 - a. L&M Construction Chemicals, Inc
 - b. Nox-Crete Products Group Vexcon Chemicals Inc
 - c. Substitutions: Section 01 60 00 - Product Requirements
- C. Absorptive Mats: ASTM C171, burlap-polyethylene, minimum 9 oz/sq yd bonded to prevent separation during handling and placing
- D. Water: Potable, not detrimental to concrete

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution
- B. Verify substrate surfaces are ready to be cured

3.2 INSTALLATION - HORIZONTAL SURFACES

- A. Cure concrete in accordance with ACI 308.1
- B. Membrane Curing Compound: Apply curing compound in two coats with second coat applied at right angles to first
- C. Install Non-Membrane Forming Curing Compound Type C, in areas to receive floor finishes adhered to the concrete slab

3.3 INSTALLATION - VERTICAL SURFACES

- A. Cure concrete in accordance with ACI 308.1
- B. Membrane Curing Compound: Apply compound in two coats with second coat applied at right angles to first

3.4 PROTECTION OF FINISHED WORK

- A. Section 01 73 00 - Execution: Protection of finished Work
- B. Do not permit traffic over unprotected floor surface

END OF SECTION

SECTION 03 60 00

GROUTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Portland cement grout
 - 2. Non-shrink cementitious grout
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 318 - Building Code Requirements for Structural Concrete
- B. American Society of Testing and Materials:
 - 1. ASTM C33 - Standard Specification for Concrete Aggregates
 - 2. ASTM C40 - Test Method for Organic Impurities in Fine Aggregates for Concrete
 - 3. ASTM C150 - Standard Specification for Portland cement
 - 4. ASTM C191 - Test Method for Time of Setting of Hydraulic Cement by Vicat Needle
 - 5. ASTM C307 - Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing
 - 6. ASTM C531 - Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
 - 7. ASTM C579 - Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, monolithic Surfacing and Polymer Concretes
- C. ASTM C827 - Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures
- D. U. S. Army Corps of Engineers Concrete Research Division (CRD):
 - 1. CRD C621 - Non-Shrink Grout

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals
- B. Product Data: Submit product data on grout

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products
- B. Deliver grout in manufacturer's unopened containers with proper labels intact
- C. Store grout in a dry shelter, protect from moisture

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site

- B. Maintain minimum temperature of 45 degrees F before, during, and after grouting, until grout has set

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT GROUT MATERIALS

- A. Portland cement: ASTM C150, Type I and II
- B. Water:
 - 1. Potable; containing no impurities, suspended particles, algae or dissolved natural salts in quantities capable of causing:
 - a. Corrosion of steel
 - b. Volume change increasing shrinkage cracking
 - c. Efflorescence
 - d. Excess air entraining
- C. Fine Aggregate:
 - 1. Washed natural sand
 - 2. Gradation in accordance with ASTM C33 and represented by smooth granulometric curve within required limits
 - 3. Free from injurious amounts of organic impurities as determined by ASTM C40
- D. Mix:
 - 1. Portland cement, sand and water
 - 2. Do not use ferrous aggregate or staining ingredients in grout mixes

2.2 NON-SHRINK CEMENTITIOUS GROUT

- A. Manufacturers:
 - 1. Euclid Chemical Company
 - 2. L&M Construction Chemicals, Inc
 - 3. Quikrete
 - 4. Sika Corporation
 - 5. Substitutions: Section 01 60 00 - Product Requirements
- B. Non-shrink Cementitious Grout: Pre-mixed ready for use formulation requiring only addition of water; non-shrink, non-corrosive, non-metallic, non-gas forming, no chlorides
- C. Properties: Certified to maintain initial placement volume or expand after set and meet the following minimum properties when tested in accordance with CRD-C621, for Type D non-shrink grout:
- D. Properties

	Test	Time	Result
Setting Time	ASTM C191	Initial	2 hours (Approx)
		Final	3 hours (Approx)
Expansion			0.10% - 0.4% Maximum
Compressive Strength	CRD-C621	1 day	2,500 psi
		7 days	4,500 psi
		28 days	6,000 psi

2.3 FORMWORK

- A. Refer to Section 03 10 00 for formwork requirements

2.4 CURING

- A. Prevent rapid loss of water from grout during first 48 hours by use of approved membrane curing compound or with use of wet burlap method

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Verification of existing conditions before starting work
- B. Verify areas to receive grout

3.2 PREPARATION

- A. Remove defective concrete, laitance, dirt, oil, grease and other foreign material from concrete surfaces by brushing, hammering, chipping or other similar means until sound, clean concrete surface is achieved
- B. Rough concrete lightly, but not enough to interfere with placement of grout
- C. Remove foreign materials from metal surfaces in contact with grout
- D. Align, level and maintain final positioning of components to be grouted
- E. Saturate concrete surfaces with clean water; remove excess water, leave none standing

3.3 INSTALLATION - FORMWORK

- A. Construct leak proof forms anchored and shored to withstand grout pressures
- B. Install formwork with clearances to permit proper placement of grout

3.4 MIXING

- A. Portland Cement Grout:
 - 1. Use proportions of 2 parts sand and 1 part cement, measured by volume
 - 2. Prepare grout with water to obtain consistency to permit placing and packing
 - 3. Mix water and grout in two steps; pre-mix using approximately 2/3 of water; after partial mixing, add remaining water to bring mix to desired placement consistency and continue mixing 2 to 3 minutes
 - 4. Mix only quantities of grout capable of being placed within 30 minutes after mixing
 - 5. Do not add additional water after grout has been mixed
 - 6. Capable of developing minimum compressive strength of 2400 psi in 48 hours and 7000 psi in 28 days
- B. Mix and prepare non-shrink cementitious grout in accordance with manufacturer's instructions
 - 1. Capable of developing minimum compressive strength of 2400 psi in 48 hours and 7000 psi in 28 days
- C. Mix grout components in proximity to work area and transport mixture quickly and in manner not permitting segregation of materials

3.5 PLACING GROUT

- A. Place grout material quickly and continuously
- B. Do not use pneumatic-pressure or dry-packing methods
- C. Apply grout from one side only to avoid entrapping air

- D. Do not vibrate placed grout mixture, or permit placement when area is being vibrated by nearby equipment
- E. Thoroughly compact final installation and eliminate air pockets
- F. Do not remove leveling shims for at least 48 hours after grout has been placed

3.6 CURING

- A. Immediately after placement, protect grout from premature drying, excessively hot or cold temperatures, and mechanical injury
- B. After grout has attained its initial set, keep damp for minimum of 3 days

3.7 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing
- B. Field inspection and testing will be performed in accordance with ACI 301, ACI 318 and under provisions of Section 01 40 00 - Quality Requirements
- C. Submit proposed mix design of each class of grout to testing firm for review prior to commencement of Work
- D. Tests of grout components may be performed to ensure conformance with specified requirements

END OF DIVISION

DIVISION 04 MASONRY

SECTION 04 05 03

MASONRY MORTARING AND GROUTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes mortar and grout for masonry
- B. Related Sections
 - 1. Section 08 12 14 - Standard Steel Frames: Grouting steel door frames

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 530 - Building Code Requirements for Masonry Structures
 - 2. ACI 530.1 - Specifications for Masonry Structures
- B. ASTM International:
 - 1. ASTM C5 - Standard Specification for Quicklime for Structural Purposes
 - 2. ASTM C91 - Standard Specification for Masonry Cement
 - 3. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 - 4. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete
 - 5. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar
 - 6. ASTM C150 - Standard Specification for Portland Cement
 - 7. ASTM C206 - Standard Specification for Finishing Hydrated Lime
 - 8. ASTM C270 - Standard Specification for Mortar for Unit Masonry
 - 9. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete
 - 10. ASTM C404 - Standard Specification for Aggregates for Masonry Grout
 - 11. ASTM C476 - Standard Specification for Grout for Masonry
 - 12. ASTM C595 - Standard Specification for Blended Hydraulic Cements
 - 13. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
 - 14. ASTM C1019 - Standard Test Method for Sampling and Testing Grout
 - 15. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms
 - 16. ASTM C1329 - Standard Specification for Mortar Cement
 - 17. ASTM C1357 - Standard Test Method for Evaluating Masonry Bond Strength

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal requirements
- B. Samples: Submit samples of mortar, illustrating mortar color and color range
- C. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, required environmental conditions, and admixture limitations

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 530 and ACI 530.1

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements

- B. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F
- C. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Portland Cement: ASTM C150, Type I, gray color
- B. Masonry Cement: ASTM C91, Type S, gray color
- C. Mortar Cement: ASTM C1329, Types S, gray color
- D. Mortar Aggregate: ASTM C144, standard masonry type
- E. Hydrated Lime: ASTM C206, Type S
- F. Quicklime: ASTM C5, non-hydraulic type
- G. Grout Aggregate: ASTM C404, fine and coarse
- H. Water: Clean and potable
- I. Mortar Color: Mineral oxide pigment; color as selected
- J. Admixture: Request approval from Architect
- K. Calcium chloride is not permitted

2.2 MIXES

- A. Mortar Mixes:
 - 1. Mortar For Structural Masonry: ASTM C270, Type S using Proportion specification
 - 2. Mortar For Non-Structural Masonry: ASTM C270, Type S using Proportion specification
- B. Mortar Mixing:
 - 1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use
 - 2. Achieve uniformly damp sand immediately before mixing process
 - 3. Add mortar color and admixtures to achieve uniformity of mix and coloration
 - 4. Re-temper only within two hours of mixing
- C. Grout Mixes:
 - 1. Grout for Non-Structural Masonry: 2,000 psi strength at 28 days; mixed in accordance with ASTM C476 Fine grout
 - 2. Grout for Structural Masonry: 2,500 psi strength at 28 days; mixed in accordance with ASTM C476 Fine grout
 - 3. Application:
 - a. Fine Grout: For grouting other spaces
- D. Grout Mixing:
 - 1. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476
 - 2. Add admixtures; mix uniformly

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Examination of Existing Conditions
- B. Request inspection of spaces to be grouted.

3.2 PREPARATION

- A. Apply bonding agent to existing concrete surfaces

3.3 INSTALLATION

- A. Install mortar and grout in accordance with ACI 530.1 Specifications for Masonry Structures
- B. Solid grout masonry units up first 4'-0" above foundation wall. Verify with structural drawings for masonry units to receive solid grouting.

3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing
- B. Establishing Mortar Mix: In accordance with ASTM C270
- C. Testing of Mortar Mix: In accordance with ASTM C780 for aggregate ratio and water content, air content, consistency, and compressive strength
- D. Testing of Grout Mix: In accordance with ASTM C1019 for compressive strength, and in accordance with ASTM C143/C143M for slump
- E. Test flexural bond strength of mortar and masonry units to ASTM C1357; test in conjunction with masonry unit sections specified
- F. Test compressive strength of mortar and masonry to ASTM C1314; test in accordance with masonry unit sections specified

END OF SECTION

SECTION 04 20 16

REINFORCED UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes concrete masonry units, Hollow brick units reinforcement, anchorage, and accessories.
- B. Related Sections:
 - 1. Section 04 05 03 - Masonry Mortaring and Grouting: Mortar and grout.
 - 2. Section 05 12 00 - Structural Steel Framing: Product requirements for steel anchors for placement by this section.
 - 3. Section 05 50 00 - Metal Fabrications: Product requirements for loose steel lintels and fabricated steel items, for placement by this section.
 - 4. Section 07 62 00 - Sheet Metal Flashing and Trim: Product requirements for reglets for flashings for placement by this section.
 - 5. Section 07 90 00 - Joint Protection: Rod and sealant at control and expansion joints.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 530 - Building Code Requirements for Masonry Structures.
 - 2. ACI 530.1 - Specifications for Masonry Structures.
- B. ASTM International:
 - 1. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. ASTM A951 - Standard Specification for Masonry Joint Reinforcement.
 - 4. ASTM C90 - Standard Specification for Load bearing Concrete Masonry Units.
 - 5. ASTM C129 - Standard Specification for Non load bearing Concrete Masonry Units.
 - 6. ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal requirements.
- B. Shop Drawings: Indicate bars sizes, spacing, locations, reinforcement quantities, bending and cutting schedules, supporting and spacing devices for reinforcement, and accessories.
- C. Product Data:
 - 1. Submit data for masonry units and wall ties, anchors, and other accessories.
 - 2. Indicate initial rate of absorption for clay and shale brick.

- D. Samples: Submit four samples of decorative block units to illustrate color, texture and extremes of color range.
- E. Design Data: Indicate required mortar strength, specified compressive strength of masonry, masonry unit assembly strength in each plane, and supportive test data.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 530 and ACI 530.1.

1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.6 PRE-INSTALLATION MEETINGS

- A. Section 01 31 00 - Project Management and Coordination: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Accept decorative glazed pre-faced units on site. Inspect for damage.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.
- C. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

1.9 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Coordinate masonry work with brick veneer, installation of window and door anchors.

PART 2 PRODUCTS

2.1 REINFORCED UNIT MASONRY ASSEMBLIES

- A. Manufacturers:
 - 1. Basalite Concrete Products
 - 2. Oldcastle
 - 3. Buehner Block Co.
 - 4. Echelon Masonry
 - 5. Substitutions: Section 01 60 00 - Product Requirements.

2.2 COMPONENT

- A. Insulated Concrete Masonry Units: ASTM C90
 - 1. Manufacturers:
 - a. Oldcastle: InsulTech
 - b. Spec-Thermal: Korfil Hi-R
 - c. Basalite: Spec-Thermal
 - 2. Style: Split face exterior, smooth face interior
 - 3. Size and Shape: Modular size 12 x 8 x 16, or as indicated on the drawings
 - 4. Color: To be selected from manufacturers full range of colors
 - 5. R-Value: Min of R-12
 - 6. Weight: Normal
- B. Hollow Load Bearing Concrete Masonry Units (CMU): ASTM C90; normal weight.
- C. Hollow Non-Load Bearing Concrete Masonry Units (CMU): ASTM C129; normal weight.
- D. Decorative Concrete Masonry Units: ASTM C90
 - 1. Style: Split face
 - 2. Weight: Normal weight
 - 3. Size and Shape: Modular size of 8 x 8 x 16 inches and 4x8x16 inches.
 - 4. Color: color as selected from Manufacturer's standard colors
- E. Standard Concrete Masonry Unit: ASTM C90
 - 1. Weight: Nominal weight,
 - 2. Size and Shape: Modular size of 8 x 8 x 16 inches, 12 x 8 x 16, and 4 x 8 x16 inches.

2.3 ACCESSORIES

- A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.
- B. Strap Anchors: bent steel shape, as required; ASTM A153/A153M hot dip galvanized. Mortar and Grout: As specified in Section 04 05 03.
- C. Preformed Control Joints: Rubber or Neoprene material. Furnish with corner and tee accessories, heat or cement fused joints.
- D. Joint Filler: Closed cell polyvinyl chloride, polyethylene, polyurethane, or rubber; oversized 50 percent to joint width; self expanding; joint width x by maximum lengths.

- E. Building Paper: ASTM D226; Type I, No. 15 un-perforated asphalt felt.
- F. Nailing Strips: Specified in Section 06 10 53. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
- G. Steel Lintels: size as indicated on Drawings inch size.

2.4 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify field conditions are acceptable and are ready to receive work.
- C. Verify items provided by other sections of work are properly sized and located.
- D. Verify built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other Sections.
- B. Furnish temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent support.

3.3 INSTALLATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
- C. Coursing of Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave.
- D. Placing And Bonding:
 - 1. Lay solid masonry units in full bed of mortar, with full head joints.
 - 2. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
 - 3. Remove excess mortar as Work progresses.
 - 4. Interlock intersections and external corners.
 - 5. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.

6. Perform job site cutting of masonry units with proper tools to assure straight, clean, un-chipped edges. Prevent broken masonry unit corners or edges.
 7. Isolate masonry from vertical structural framing members with movement joint as indicated on Drawings.
 8. Isolate top of masonry from horizontal structural framing members and slabs or decks with compressible joint filler
- E. Lintels:
1. Install loose steel lintels over openings.
 2. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled or indicated.
 3. Reinforce openings as indicated on Drawing.
 4. Do not splice reinforcing bars.
 5. Support and secure reinforcing bars from displacement.
 6. Place and consolidate grout fill without displacing reinforcing.
 7. Allow masonry lintels to attain specified strength before removing temporary supports.
 8. Maintain minimum 8 inch bearing on each side of opening.
- F. Grouted Components:
1. Reinforce bond beam a
 2. Lap splices bar diameters required by code.
 3. Support and secure reinforcing bars from displacement.
 4. Place and consolidate grout fill without displacing reinforcing.
 5. At bearing locations, fill masonry cores with grout for minimum 16 inches either side of opening.
- G. Reinforced Masonry:
1. Lay masonry units with core cells vertically aligned and clear of mortar and unobstructed.
 2. Place reinforcing, reinforcement bars, and grout as indicated on Drawings.
 3. Splice reinforcement in accordance with Section 03 20 00.
 4. Support and secure reinforcement from displacement.
 5. Place and consolidate grout fill without displacing reinforcing.
 6. Place grout in accordance with ACI 530.1 Specification for Masonry Structures.
- H. Control And Expansion Joints:
1. Install control and expansion joints at the following maximum spacings, unless otherwise indicated on Drawings:
 - a. At changes in wall height.
 2. Do not continue horizontal joint reinforcement through control and expansion joints.
 3. Form control joint with sheet building paper bond breaker fitted to one side of hollow contour end of block unit. Fill resultant elliptical core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
 4. Install preformed control joint device in continuous lengths. Seal butt and corner joints.
 5. Size control joint in accordance with Section 07 90 00 for sealant performance.
 6. Form expansion joint by omitting mortar and cutting unit to form open space.
- I. Built-In Work:

1. As work progresses, install built-in metal door and glazed frames, fabricated metal frames, window frames, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.
 2. Install built-in items plumb and level.
 3. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 8 inches from framed openings.
 4. Do not build in materials subject to deterioration.
- J. Cutting And Fitting:
1. Cut and fit for chase, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.
 2. Obtain Architect/Engineer's approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.
- ERECTION TOLERANCES
- K. Section 01 40 00 - Quality Requirements: Tolerances.
- L. Maximum Variation From Alignment of Columns or Pilasters: 1/4 inch.
- M. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- N. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- O. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- P. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- Q. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- R. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.
- S. Maximum Variation for Steel Reinforcement:
1. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.
 2. Plus or minus 1/2 inch when distance from centerline of steel to opposite face of masonry is 8 inches or less.
 3. Plus or minus 1 inch when distance is between 8 and 24 inches.
 4. Plus or minus 1-1/4 inch when distance is greater than 24 inches.
 5. Plus or minus 2 inches from location along face of wall.

3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Concrete Masonry Units: Test each type in accordance with ASTM C140.

3.5 CLEANING

- A. Section 01 73 00 - Execution and Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Remove excess mortar and mortar smears as work progresses.
- C. Replace defective mortar. Match adjacent work.
- D. Clean soiled surfaces with cleaning solution.
- E. Use non-metallic tools in cleaning operations.

3.6 PROTECTION OF FINISHED WORK

- A. Section 01 73 00 - Execution and Section 01 77 00 - Closeout Procedures: Requirements for protecting finished Work.
- B. Protect exposed external corners subject to damage.
- C. Protect base of walls from mud and mortar splatter.
- D. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.
- E. Protect tops of masonry work with waterproof coverings secured in place without damaging masonry. Provide coverings where masonry is exposed to weather when work is not in progress.

END OF SECTION

SECTION 04 20 19

VENEER UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes concrete masonry units, facing brick units, and reinforcement, anchorage, and accessories
- B. Related Sections:
 - 1. Section 04 05 03 - Masonry Mortaring and Grouting: Product Requirements for Mortar and grout
 - 2. Section 05 50 00 - Metal Fabrications: Execution requirements for loose steel lintels for placement by this section
 - 3. Section 07 62 00 - Sheet Metal Flashing and Trim: Product requirements for reglets for flashings for placement by this section
 - 4. Section 07 90 00 - Joint Protection: Rod and sealant at control and/or expansion joints

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 530 - Building Code Requirements for Masonry Structures
 - 2. ACI 530.1 - Specifications for Masonry Structures
- B. ASTM International:
 - 1. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
 - 2. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 3. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 4. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
 - 5. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units
 - 6. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)
 - 7. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

1.3 PERFORMANCE REQUIREMENTS

- A. Clay Masonry Compressive Strength (f_m): 3,000 psi; determined by unit strength method
- B. Concrete Masonry Compressive Strength (f_m): 1,350 psi; determined by unit strength method

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Samples: Submit four samples of face brick, units to illustrate color, texture and extremes of color range
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 530 and ACI 530.1

1.6 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum three years documented experience

1.7 MOCKUP

- A. Section 01 40 00 - Quality Requirements: Mockup requirements
- B. Construct masonry mockup; see elevations for location and size. Include brick, cast stone and field brick, including masonry, mortar and accessories. Mock-up can be used as final construction if approved by Architect. Contractor to include in bid a minimum of three (3) mockups for review and approval. All materials to be submitted and approved prior to construction of mock-up.
- C. Locate where directed on elevations.
- D. Retain accepted mockup as completed Work or remove mockup as directed by Architect

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements
- B. Accept masonry units on site and inspect for damage

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F
- C. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph

1.10 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions
- B. Coordinate masonry work with installation of window and door anchors

PART 2 - PRODUCTS

2.1 CMU VENEER ASSEMBLIES

- A. Manufacturers:
 - 1. Endicott Clay Products Co.
 - 2. Interstate Brick
 - 3. The Belden Brick Co.
 - 4. Robinson Brick Company
 - 5. Basalite
 - 6. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPONENTS

A. CONCRETE MASONRY UNITS

1. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
Provide square-edged units for outside corners unless otherwise indicated.
2. CMUs:
Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2000 psi (19.3 MPa).
Density Classification: Normal weight.
Size (Actual Dimensions): 3-5/8 inches wide by 3-5/8 inches high by 15-5/8 inches (194 mm)
Color: From manufactures standard colors
Style: 4"x4"x16
- 3.

2.3 ACCESSORIES

- A. Veneer Anchors: Hohmann and Barnard thermal 2-seal wing nut anchor
 1. Size for 5/8" wallboard and 2" rigid insulation
 2. Use with stainless steel 2x hook.
 - a. Length:
 - 1) 5" at pilasters Field Verify
- B. Strap anchors; bend steel shape; size as required, adjustable as necessary, hot-dip galvanized to ASTM A153 finish
- C. Wall Ties: Corrugated formed sheet metal, size as required; ASTM A153/A153M hot dip galvanized
- D. Mortar and Grout: As specified in Section 04 05 03
- E. Galvanized Steel: ASTM A653/A653M, G90 finish, 26-gage core steel
- F. Joint Filler: Closed cell polyvinyl chloride, polyethylene, polyurethane, or rubber; oversized 50 percent to joint width x by maximum lengths; self-expanding
- G. Building Paper: ASTM D226; Type I, No. 15 un-perforated asphalt felt
- H. Weeps: Spaced 32" o.c. Preformed plastic tubes, hollow
- I. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials
- J. Steel Lintels: size as indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: coordination and project conditions
- B. Verify field conditions are acceptable and are ready to receive work
- C. Verify items provided by other sections of work are properly sized and located
- D. Verify built-in items are in proper location, and ready for roughing into masonry work

3.2 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other sections
- B. Furnish temporary bracing during installation of masonry work
 - 1. Maintain in place until building structure provides permanent support
- C. Wet clay and shale brick before laying when initial rate of absorption is greater than 30 grams when tested in accordance with ASTM C67

3.3 INSTALLATION

- A. Establish lines, levels, and coursing indicated
 - 1. Protect from displacement.
- B. Maintain masonry courses to uniform dimension
 - 1. Form bed and head joints of uniform thickness
- C. Coursing of Brick Units:
 - 1. Coordinate coursing with drawings and elevations.
 - 2. Bond Base: Flemish
 - 3. Bond Field: Running
 - 4. Coursing: three units and three mortar joints to equal 8"
 - 5. Bond Column Inset: Stacked
 - 6. Mortar Joints: raked
- D. Placing and Bonding:
 - 1. Lay solid masonry units in full bed of mortar, with full head joints
 - 2. Lay hollow masonry units with face shell bedding on head and bed joints
 - 3. Buttering corners of joints or excessive furrowing of mortar joints is not permitted
 - 4. Remove excess mortar as work progresses
 - 5. Interlock intersections and external corners
 - 6. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace
 - 7. Perform job site cutting of masonry units with proper tools to assure straight, clean, unchipped edges. Prevent broken masonry unit corners or edges
 - 8. Isolate masonry from vertical structural framing members with movement joint as indicated on Drawings
 - 9. Isolate top of masonry from horizontal structural framing members and slabs or decks with compressible joint filler as indicated on Drawings
- E. Weeps and Vents: Furnish weeps and vents in outer wythe at 32 inches o.c. horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls
- F. Joint Reinforcement And Anchorage - Masonry Veneer:
 - 1. Secure wall ties or strap anchors to stud framed backing and embed into masonry veneer at maximum 16 inches oc vertically and 32 inches oc horizontally
 - 2. Place wall ties at maximum 3 inches oc vertically within 12 inches of jamb of wall openings
 - 3. Place wall ties at maximum 3 inches on center horizontally within 12 inches of head and sill of wall openings
 - 4. Reinforce joint corners and intersections with strap anchors 16 inches oc
- G. Masonry Flashings:
 - 1. Extend flashings horizontally through outer wythe at foundation walls, above ledge or shelf angles and lintels, under parapet caps, at bottom of walls, and turn down on outside face to form drip
 - 2. Turn flashing up minimum 8 inches and bed into mortar joint of masonry or seal to concrete or seal to sheathing over steel stud backing
 - 3. Lap end joints minimum 6 inches and seal watertight

4. Turn flashing, fold, and seal at corners, bends, and interruptions
- H. Lintels:
1. Install loose steel lintels over openings
 2. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled or indicated
 3. Do not splice reinforcing bars
 4. Support and secure reinforcing bars from displacement
 5. Place and consolidate grout fill without displacing reinforcing
 6. Allow masonry lintels to attain specified strength before removing temporary supports
 7. Maintain minimum bearing on each side of opening
 - a. Steel: 4 inches
- I. Grouted Components:
1. Reinforce bond beam as shown on drawings
 2. Lap splices bar diameters required by code
 3. Support and secure reinforcing bars from displacement
 4. Place and consolidate grout fill without displacing reinforcing
 5. At bearing locations, fill masonry cores with grout for minimum 8 inches both sides of opening
- J. Control And Expansion Joints:
1. Install control and expansion joints at the following maximum spacings, unless otherwise indicated on Drawings:
 - a. Exterior Walls: 20 feet on center and within 24 inches on one side of each interior and exterior corner
 - b. At changes in wall height
 2. Locate expansion joints in brick at returns, building corners, and at 30 feet maximum spacing
 3. Do not continue horizontal joint reinforcement through control and expansion joints
 4. Install preformed control joint device in continuous lengths
 - a. Seal butt and corner joints
 5. Size control joint in accordance with Section 07 90 00 for sealant performance
 6. Form expansion joint by omitting mortar and cutting unit to form open space
- K. Cutting And Fitting:
1. Cut and fit for chases, pipes, conduit, sleeves, and grounds
 - a. Coordinate with other sections of work to provide correct size, shape, and location
 2. Obtain Architect approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired

3.4 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances
- B. Maximum Variation from Alignment of Columns or Pilasters: 1/4 inch
- C. Maximum Variation from Unit to Adjacent Unit: 1/16 inch
- D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more
- E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more
- F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft
- G. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft
- H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch
- I. Maximum Variation for Steel Reinforcement:
 1. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls

2. Plus or minus 1/2 inch when distance from centerline of steel to opposite face of masonry is 8 inches or less
3. Plus or minus 1 inch when distance is between 8 and 24 inches
4. Plus or minus 1-1/4 inch when distance is greater than 24 inches
5. Plus or minus 2 inches from location along face of wall

3.5 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing
- B. Brick Units: Test each type in accordance with ASTM C67, 5 random units for each 50,000 units installed

3.6 CLEANING

- A. Section 01 71 00 - Execution and Section 01 77 00 - Closeout Procedures: Final cleaning
- B. Remove excess mortar and mortar smears as work progresses
- C. Replace defective mortar. Match adjacent work
- D. Clean soiled surfaces with cleaning solution
- E. Use non-metallic tools in cleaning operations

3.7 PROTECTION OF FINISHED WORK

- A. Section 01 71 00 - Execution and Section 01 77 00 - Closeout Procedures: Requirements for protecting finished Work
- B. Protect exposed external corners subject to damage
- C. Protect base of walls from mud and mortar splatter
- D. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar
- E. Protect tops of masonry work with waterproof coverings secured in place without damaging masonry
 1. Provide coverings where masonry is exposed to weather when work is not in progress

END OF SECTION

SECTION 04 72 00

CAST STONE MASONRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cast Units features, trim, ornamentation and facings.

1.2 RELATED SECTIONS

- A. Section 04 05 03 - Masonry Mortaring and Grouting.
- B. Section 04 20 19 - Veneer Unit Masonry
- C. Section 07 90 00 - Joint Protection

1.3 REFERENCES

- A. ASTM C1364, Standard Specification for Architectural Cast Stone.
- B. ASTM C1194, Standard Test Method for Compressive Strength of Architectural Cast Stone.
- C. ASTM C1195, Standard Test Method for Absorption of Architectural Cast Stone.
- D. International Masonry Institute All-Weather Council: Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- E. Masonry Advisory Council: Hot and Cold Weather Construction.

1.4 DEFINITIONS

- A. Cast Units – manufactured from zero slump concrete.
 - 1. Vibrant Dry Tamp (VDT) casting method: Vibratory ramming of earth moist, zero-slump concrete against a rigid mold until it is densely compacted.

1.5 SHOP DRAWINGS

- A. Submit shop drawings as specified in Section 01 33 00 Submittal Procedures.
- B. Shop Drawings: including profiles, cross-sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, annotation of stone types and their location.

1.6 SAMPLES

- A. Submit Samples as specified in Section 01 33 00 Submittal Procedures.
- B. Selection Samples: duplicate samples, illustrating available finishes and colors for selection by Architect.

1.7 TEST REPORTS

- A. Submit test reports as specified in Section 01 33 00 Submittal Procedures.
- B. Test Reports: test results prepared by an independent testing agency, indicating tested material characteristics as part of a source quality control program, current within the past two (2) years.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: manufacturer having sufficient plant facilities to produce the shapes, quantities and size of Products required in accordance with the project schedule.
- B. Mock-up: Supply sufficient quantity of full size cast units for use in constructing mock-up panel, as specified in Section 04 05 03 Masonry Mortaring and Grouting.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 01 60 00 Product Requirements.
- B. Deliver cast units in protective film. Prevent damage to units.
- C. Lift skids with proper and sufficiently long slings or forks with protection to prevent damage to units. Protect edges and corners.
- D. Store cast units on level ground in a manner designed to prevent damage and staining of units.
- E. Stack units on timbers or platforms at least 3 inches above grade.
- F. Place polyethylene or other plastic film between wood and other finished surfaces of units when stored for extended periods of time.
- G. Cover stored units with protective enclosure if exposed to weather.
- H. Do not use salt or calcium-chloride to remove ice from masonry surfaces.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Maintain materials and surrounding air temperature at minimum 52 degrees F prior to and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers of cast units having Products considered acceptable for use:
 - 1. Arriscraft International.
 - 2. Continental Cast Stone
- B. Substitutions: Refer to 01 25 00 Substitution Procedures.

2.2 MATERIALS

- A. Portland Cement: to ASTM C150, Type I or Type III, White color.
- B. Coarse Aggregate: Limestone, to ASTM C33, except for gradation.

- C. Fine Aggregate: Manufactured or natural sands, to ASTM C33, except for gradation.
- D. Pigments: Inorganic iron oxide pigments, to ASTM C979. Do not use carbon black pigment.
- E. Retarding, Accelerating and High-Range Admixtures: to ASTM C494/C495M, Types A - G.
- F. Water Repellents and Other Chemical Admixtures: previously established as suitable for use in concrete by proven field performance or through laboratory testing.
- G. Dark Mineral Admixtures: to ASTM C618.
- H. Water: Potable.

2.3 COMPONENTS

- A. Cast Units: Sizes and profiles as indicated on Drawings and having the following physical properties:
 1. Compressive Strength (ASTM C1194): > 6,500 psi at 28 days.
 2. Absorption (ASTM C1195): < 6.0% percent at 28 days.
 3. Color and texture as selected by Architect.
- B. Mortar: Portland cement-hydrated lime-sand mix, Type N to ASTM C270, as specified in Section 04 05 03.
- C. Grout: maximum 6,500 psi at 28 days, as specified in Section 04 05 03.
- D. Anchors: stainless steel type, as specified in Section 04 20 19.
- E. Joint Sealants and Backer Rods: non-staining type, as specified in Section 07 90 00.
- F. Flashing, Vents, and Accessories: as specified in Section 04 20 19.

2.4 FABRICATION

- A. Fabricate cast stone masonry units to sizes and profiles as indicated on Drawings.
- B. Fabricate Cast units using the Vibrant Dry Tamp Casting method.
- C. Do not use dark mineral admixtures in surfaces intended to be exposed to view
- D. Steam cure cast stone units at a minimum temperature of 104 degrees F for a minimum of 10 hours at 100% humidity.
- E. Yard cure units for 350 degree-days prior to shipping.

2.5 FABRICATION TOLERANCES

- A. Cross Section Dimensions: not deviating by more than plus or minus 1/8 inch from approved dimensions.
- B. Length of Units: not deviating by more than L/360 or plus or minus 1/8 inch, whichever is greater, maximum plus or minus 1/4 inch.

- C. Maximum Length of any Unit: maximum 15 times the average thickness of the unit.
- D. Warp, Bow or Twist of Units: maximum L/360 or plus or minus 1/8 inch, whichever is greater.
- E. Location of Dowel Holes, Anchor Slots, Flashing Grooves, False Joints: maximum deviation as follows:
 - 1. On Formed Sides of Unit: 1/8 inch,
 - 2. On Unformed Sides of Unit: 3/8 inch.

2.6 FINISHES

- A. Exposed Surfaces: fine-grained texture similar to natural stone, color as selected by Architect, free of cracks, chips or other defects that would affect the strength or serviceability of the unit or become exposed once installed and visible when viewed from a distance of not less than 15 feet under diffused light.

2.7 SOURCE QUALITY CONTROL

- A. Test Cast units as specified in Section 01 40 00 Quality Requirements.
- B. Test compressive strength and absorption from specimens selected at random from plant production, to ASTM C1194 and ASTM C1195.
 - 1. Test samples taken from every 500 cubic feet of product produced.
 - 2. Test new and existing mix designs for strength and absorption compliance prior to producing units.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions are ready to receive work.
- B. Inspect materials for fit and finish prior to installation. Do not set unacceptable units.
- C. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install cast units where indicated on Drawings. Conform to ACI 530/ASCE 5, Building Code Requirements for Masonry Structures and ACI 530.1/ASCE 6, Specifications for Masonry Structures.
- B. Drench units with clean water prior to setting.
- C. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
- D. Set units in full bed of mortar, unless otherwise detailed. Flush vertical joints full with mortar.
- E. Maintain 3/8 inch wide joints.
- F. Leave joints with exposed tops or under relieving angles open for sealant.
- G. Leave head joints in copings and projecting components open for sealant.

- H. Rake mortar joints 3/4 inch for pointing or sealing.
- F. Remove excess mortar from unit faces immediately after setting.
- G. Tuck point unit joints to a slight concave profile, except those designated to receive joint sealant.
- H. Seal remaining joints with backer rod and joint sealant. Conform to Section 07 90 00.

3.3 SITE TOLERANCES

- A. Variation in Alignment from Unit to Adjacent Unit: 1/16 inch maximum.
- B. Variation of Mortar Joint Thickness: 1/8 inch every 3 feet.

3.4 FIELD QUALITY CONTROL

- A. Perform inspection and testing as specified in Section 01 40 00.
- B. Test one randomly selected sample from the field for each 500 cubic feet delivered to the job site. Verify compliance with the following:
 - 1. Three field cut cube specimens from each of these samples shall have an average minimum compressive strength of not less than 85 percent with no single specimen testing less than 75 percent of design strength as allowed by ACI 318.
 - 2. Three field cut cube specimens from each of these samples shall have an average maximum cold-water absorption of 6 percent.
- C. Architect Inspection: Architect will inspect installed masonry and reject masonry that is chipped, cracked, or blemished (streaked, stained or otherwise damaged), as described below.
 - 1. Masonry will be inspected to be free of chips, cracks or other blemishes on the finished face or front edges of the masonry units exceeding 3/8 inch or that can be seen from a distance of 10 feet.
 - 2. Units shall exhibit a texture approximately equal to the approved sample when viewed under direct daylight illumination at a 10 feet distance.
 - 3. Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under direct daylight illumination from a 20 feet distance.
 - 4. Cracking and efflorescence will not be cause for rejection.
- D. Make Good rejected masonry as directed by Architect.

3.5 ADJUSTING AND CLEANING

- A. Repair chips with touchup materials furnished by manufacturer.
- B. Clean a 100 square foot area of wall designated by Architect one-half of mock-up panel as directed below and leave for one week. If no harmful effects appear and after mortar has set and cured, clean masonry as follows:
 - 1. Protect windows, sills, doors, trim and other work from damage.
 - 2. Remove large particles with stiff fiber brushes without damaging surface.
 - 3. Saturate masonry with clean water and flush off loose mortar and dirt.
 - 4. Dilute cleaning agent with clean water in controlled proportions.
 - 5. Apply solution to pre-soaked wall surface using soft-bristled brush and/or low pressure acid-resistant sprayer.

- 6. Thoroughly rinse cleaning solution and residue from wall surface.
- C. Use alternative cleaning solutions and methods for difficult to clean masonry only after consultation with cast stone masonry unit manufacturer.

3.6 PROTECTION

- A. Protect units from damage resulting from subsequent construction operations.
- B. Use protection materials and methods which will not stain or damage units.
- C. Remove protection materials upon Substantial Completion, or when risk of damage is no longer present.

END OF DIVISION

DIVISION 05 METALS

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Structural shapes
 - 2. Channels and angles
 - 3. Hollow structural sections
 - 4. Structural pipe
 - 5. Structural plates and bar
 - 6. Bolts, connectors, and anchors
- B. Related Requirements:
 - 1. Section 03 60 00 - Grouting: Grout for setting base plates
 - 2. Section 05 50 00 - Metal Fabrications: Steel fabrications affecting structural steel work

1.2 REFERENCE STANDARDS

- A. American Institute of Steel Construction:
 - 1. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges
 - 2. AISC 341 - Seismic Provisions for Structural Steel Buildings
 - 3. AISC 360 - Specification for Structural Steel Buildings
- B. American Welding Society:
 - 1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination
 - 2. AWS D1.1 - Structural Welding Code - Steel
- C. ASTM International:
 - 1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel
 - 2. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
 - 3. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
 - 4. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
 - 5. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts
 - 6. ASTM A992/A992M - Standard Specification for Structural Steel Shapes
 - 7. ASTM F436 - Standard Specification for Hardened Steel Washers
 - 8. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
- D. Green Seal:
 - 1. GC-03 - 2nd Edition, January 1997 - Anti-Corrosive Paints.
- E. Research Council on Structural Connections:
 - 1. RCSC - Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts
- F. SSPC: The Society for Protective Coatings:
 - 1. SSPC - Steel Structures Painting Manual
 - 2. SSPC Paint 15 - Steel Joist Shop Paint
 - 3. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic)
 - 4. SSPC SP 3 - Power Tool Cleaning

5. SSPC SP 6 - Commercial Blast Cleaning

1.3 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Requirements for coordination
- B. Coordinate work with the following:
 - 1. Section 05 50 00 for miscellaneous steel supports other than structural steel

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and bolts
 - 2. Connections and Connections not detailed
 - 3. Cambers and loads
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths
- C. Manufacturer's Mill Certificate: Certify products meet or exceed specified requirements
- D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - 1. Structural Steel: Applicable AISC Specifications
 - 2. Architecturally Exposed Structural Steel: AISC 303, Section 10
 - 3. High Strength Bolted Connections: RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts

1.6 QUALIFICATIONS

- A. Fabricator: Company specializing in performing Work of this section with minimum ten years documented experience
- B. Erector: Company specializing in performing Work of this section with minimum ten years documented experience
- C. Shop Painter: Company specializing in performing Work of this section with minimum ten years documented experience
- D. Welders and Welding Procedures: AWS D1.1 qualified within previous 12 months

PART 2 - PRODUCTS

2.1 STRUCTURAL STEEL

- A. Structural W-Shapes: ASTM A992
- B. Structural M-Shapes: ASTM A36
- C. Structural S-Shapes: ASTM A36
- D. Structural T-Shapes: Cut from structural W-shapes
- E. Channels and Angles: ASTM A36/A36M
- F. Round Hollow Structural Sections: ASTM A500, Grade B
- G. Rectangular Hollow Structural Sections: ASTM A500/A500M, Grade C

- H. Structural Pipe: ASTM A53/A53M, Grade C
- I. Structural Plates and Bars: ASTM A36 unless noted otherwise

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. Bolts: Heavy hex, structural type
 - 1. ASTM A325; Type 1, plain, unless noted otherwise
- B. Nuts: ASTM A563 Grade A; heavy hex type, unless noted otherwise
 - 1. Finish: Plain
- C. Washers: ASTM F436; Type 1, circular beveled, unless noted otherwise
 - 1. Finish: Plain
- D. Threaded Rods: ASTM A36, unless noted otherwise
 - 1. Finish: Unfinished
- E. Forged Structural Steel Hardware:
 - 1. Clevises and Turnbuckles: ASTM A108; Grade 1085
 - 2. Eye Nuts and Eye Bolts: ASTM A108; Grade 1030
 - 3. Sleeve Nuts: ASTM A108; Grade 1018
 - 4. Rod Ends, Yoke Ends and Pins, Cotter Pins, and Coupling Nuts: Carbon steel

2.3 WELDING MATERIALS

- A. Welding Materials: AWS D1.1; type required for materials being welded

2.4 FABRICATION

- A. Continuously seal joined members by continuous welds
 - 1. Grind exposed welds smooth
- B. Fabricate connections for bolt, nut, and washer connectors
- C. Develop required camber for members

2.5 FINISHES

- A. Prepare structural component surfaces in accordance with SSPC SP 3
- B. Shop prime structural steel members
 - 1. Do not prime surfaces that will be field welded, in contact with concrete, or high strength bolted
- C. Galvanizing: ASTM A123/A123M; hot dip galvanize after fabrication
- D. Galvanizing for Bolts, Connectors, and Anchors:
 - 1. Hot-Dipped Galvanizing:
 - a. Bolts, Nuts, and Washers: ASTM F2329
 - b. Connectors and Anchors: ASTM A153/A153M
 - 2. Mechanical Galvanizing: ASTM B695; Class 50 minimum

2.6 ACCESSORIES

- A. Grout: Non-shrink type as specified in Section 03 60 00
- B. Shop Primer: SSPC Paint 15, Type 1, red oxide
- C. Touch-Up Primer: Match shop primer
- D. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I Inorganic or Type II Organic

2.7 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements
- B. Shop test bolted and welded connections as specified for field quality control tests

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Requirements for installation examination
- B. Verify bearing surfaces are at correct elevation
- C. Verify anchors rods are set in correct locations and arrangements with correct exposure for steel attachment

3.2 PREPARATION

- A. Section 01 73 00 - Execution.
- B. Furnish templates for installation of anchor rods and other embedments in concrete and masonry work

3.3 ERECTION

- A. Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing
- B. Field weld components and shear connectors indicated on Drawings
- C. Field connect members with threaded fasteners; torque to required resistance
- D. Do not field cut or alter structural members without approval of Architect/Engineer
- E. After erection, touch up welds and abrasions to match shop finishes

3.4 GROUT INSTALLATION

- A. Shim bearing plates and equipment supports to proper elevation, snug tighten anchor bolts
- B. Fill void under bearing surface with grout. Install and pack grout to remove air pockets
- C. Moist cure grout
- D. Remove forms after grout is set. Trim grout edges to form smooth surface
- E. Tighten anchor bolts after grout has cured for a minimum of 3 days

3.5 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances
- B. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative
- C. Maximum Offset From Alignment: 1/4 inch

3.6 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Requirements for inspecting, testing
- B. Bolted Connections: Inspect in accordance with AISC 303
 - 1. Visually inspect all bolted connections
 - 2. For Direct Tension Indicators, comply with requirements of ASTM F959. Verify that gaps are less than gaps specified in Table 2
- C. Welding: Inspect welds in accordance with AWS D1.1

1. Certify welders and conduct inspections and tests as required
 - a. Record types and locations of defects found in work
 - b. Record work required and performed to correct deficiencies
 2. Visually inspect all welds
- D. Correct defective bolted connections and welds

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Shop-fabricated metal items
 - 2. Channel door frames
 - 3. Bollards
 - 4. Ladders
 - 5. Miscellaneous structural steel supports
 - 6. Fabricated architectural details
 - 7. Anchor bolts
- B. Related Requirements:
 - 1. Section 03 30 00 - Cast-in-Place Concrete: Execution requirements for embedded anchors and attachments for metal fabrications specified by this Section in concrete
 - 2. Section 05 12 00 - Structural Steel Framing: Structural steel column anchor bolts
 - 3. Section 09 90 00 - Painting and Coating: Field applied paint finish

1.2 REFERENCE STANDARDS

- A. American National Standards Institute:
 - 1. ANSI A14.3 - Ladders - Fixed - Safety Requirements
- B. ASTM International:
 - 1. ASTM A36 - Standard Specification for Carbon Structural Steel
 - 2. ASTM A53- Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
 - 3. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
 - 4. ASTM A312 - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
 - 5. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
 - 6. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
 - 7. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts
 - 8. ASTM F436 - Standard Specification for Hardened Steel Washers
 - 9. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 ksi Yield Strength
- C. American Welding Society:
 - 1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination
 - 2. AWS D1.1 - Structural Welding Code - Steel
 - 3. AWS D1.6 - Structural Welding Code - Stainless Steel
- D. Green Seal:
 - 1. GC-03 - 2nd Edition, January 7, 1997 - Anti-Corrosive Paints.
- E. National Ornamental & Miscellaneous Metals Association:
 - 1. NOMMA Guideline 1 - Joint Finishes.
- F. SSPC: The Society for Protective Coatings:
 - 1. SSPC - Steel Structures Painting Manual

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories
 - 2. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.4 welding symbols
 - 3. Indicate net weld lengths

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products
- B. Inspection:
 - 1. Accept metal fabrications on-Site in labeled shipments
 - 2. Inspect for damage
- C. Protect metal fabrications from damage by exposure to weather or by ground contact

1.5 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings

PART 2 - PRODUCTS

2.1 DOOR FRAMES

- A. Door Frames: Steel channel sections, size indicated on Drawings, with jamb anchors suitable for building into masonry, attachment to concrete, and, minimum 4 anchors per jamb; prime paint, one coat

2.2 BOLLARDS

- A. Bollards: Steel pipe, concrete filled, crowned cap, 6 in diameter, length as indicated on Drawings; prime paint, one coat
- B. Concrete Fill: 3,000 psi as specified in Section 03 30 00 - Cast-in-Place Concrete
- C. Anchors: Concealed type as indicated on Drawings

2.3 MISCELLANEOUS STRUCTURAL STEEL SUPPORTS

- A. Other Structural Supports: Steel sections, shape and size as indicated on Drawings required to support applied loads with maximum deflection of 1/240 of the span; prime paint, one coat

2.4 FABRICATED ARCHITECTURAL TRIM

- A. Steel sections, size and configuration as indicated on Drawings
- B. Exterior Locations: Prime paint, one coat

2.5 COLD ROLLED STEEL SHEET

- A. Locations:
 - 1. Steel Counter Tops as called out on the drawings.
- B. Manufacturer
 - 1. Delform Metal Fabrications

- 2. Winnick Supply
- 3. Metals Depot
- C. Size: 4'-0" X 8'-0" sheet
- D. Gauge: 10 GA
- E. Finish: Clear Satin Lacquer

2.6 Fabrication:

- A. Form sections to shape indicated on Architectural Drawings, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest practicable lengths.

2.7 ANCHORS

- A. Anchor Rods: F1554 Grade 55
 - 1. Shape: Hooked and Straight
 - 2. Furnish with nut and washer; unfinished
- B. Epoxy Adhesive Anchors:
 - 1. Manufacturer List:
 - a. Cobra Anchors
 - b. Hilti, Inc
 - c. Simpson Strong-Tie Co., Inc
 - d. Substitutions: Section 01 60 00 - Product Requirements
- C. Grout: According to Section 03 60 00 - Grouting
- D. Threaded Rod: As shown on the drawings or as approved by Architect

2.8 MATERIALS

- A. Steel:
 - 1. Structural W-Shapes: ASTM A992
 - 2. Structural Shapes: ASTM A36
 - 3. Channels and Angles: ASTM A36
 - 4. Steel Plate: ASTM A36
 - 5. Hollow Structural Sections: ASTM A500, Grade C
 - 6. Steel Pipe: ASTM A53, Grade B, Schedule 40
 - 7. Sheet Steel: ASTM A653, Grade 33 Structural Quality
 - 8. Bolts: ASTM A325; Type 1
 - 9. Nuts: ASTM A563 heavy hex type
 - 10. Washers: ASTM F436; Type 1
 - 11. Welding Materials: AWS D1.1; type required for materials being welded
- B. Stainless Steel:
 - 1. Bars and Shapes: ASTM A276; Type 304
 - 2. Tubing: ASTM A554; Type 304
 - 3. Pipe: ASTM A312 seamless; Type 304
 - 4. Plate, Sheet, and Strip: ASTM A240; Type 304
 - 5. Bolts, Nuts, and Washers: ASTM A354
 - 6. Welding Materials: AWS D1.6; type required for materials being welded
- C. Aluminum:
 - 1. Extruded Aluminum: ASTM B221 Alloy 6063, Temper T6
 - 2. Sheet Aluminum: ASTM B209 Alloy, Temper T5
 - 3. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210 Alloy 6063, Temper T6
 - 4. Aluminum-Alloy Bars: ASTM B211 Alloy 6063, Temper T6
 - 5. Bolts, Nuts, and Washers: Stainless steel

- 6. Welding Materials: AWS D1.1; type required for materials being welded
- D. Bolts, Nuts, and Washers for Equipment and Piping:
 - 1. Carbon Steel:
 - a. Structural Connections: ASTM A307, Grade A or B, hot-dip galvanized
 - b. Anchor Bolts: ASTM A307, Grade B, ASTM A36, hot-dip galvanized
 - c. Pipe and Equipment Flange Bolts: ASTM A193, Grade B-7

2.9 FABRICATION

- A. Fit and shop assemble items in largest practical sections for delivery to Site
- B. Fabricate items with joints tightly fitted and secured
- C. Continuously seal joined members by continuous welds
- D. Grind exposed joints flush and smooth with adjacent finish surface
 - 1. Make exposed joints butt tight, flush, and hairline
 - 2. Ease exposed edges to small, uniform radius
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise
- G. Fabrication Tolerances:
 - 1. Squareness: 1/8 in maximum difference in diagonal measurements
 - 2. Maximum Offset between Faces: 1/16 in
 - 3. Maximum Misalignment of Adjacent Members: 1/16 in
 - 4. Maximum Bow: 1/8 inch in 48 in
 - 5. Maximum Deviation from Plane: 1/16 inch in 48 in

2.10 FINISHES

- A. Steel:
 - 1. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing
 - 2. Do not prime surfaces in direct contact with concrete or where field welding is required
 - 3. Prime paint items with two coats except where galvanizing is specified
 - 4. Galvanizing: ASTM A123; hot-dip galvanize after fabrication
 - 5. Galvanizing for Fasteners, Connectors, and Anchors:
 - a. Hot-Dip Galvanizing: ASTM A153
 - b. Mechanical Galvanizing: ASTM B695; Class 50 minimum
 - 6. Sheet Steel: Galvanized with G90 coating class
 - 7. Bolts: Unfinished
 - 8. Nuts: Unfinished
 - 9. Washers: Unfinished
 - 10. Shop Primer: SSPC Paint 15, Type 1, red oxide
 - 11. Touch-Up Primer: Match shop primer
 - 12. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I or Inorganic SSPC Paint 20 Type II Organic

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Requirements for installation examination.
- B. Verify field conditions are acceptable and are ready to receive Work

3.2 PREPARATION

- A. Section 01 73 00 - Execution: Requirements for installation preparation
- B. Clean and strip primed steel items to bare metal where Site welding is required
- C. Do not embed aluminum products into cementitious materials
- D. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, and free from distortion or defects
- B. Make provisions for erection stresses
 - 1. Install temporary bracing to maintain alignment until permanent bracing and attachments are installed
- C. Field weld components indicated on Drawings
- D. Perform field welding according to AWS D1.1
- E. Obtain approval of Architect prior to Site cutting or making adjustments not scheduled

3.4 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Requirements for tolerances
- B. Maximum Variation from Plumb: 1/4 in per story or for every 12 ft in height, whichever is greater, non-cumulative
- C. Maximum Variation from Level: 1/16 inch in 3 ft and 1/4 inch in 10 ft
- D. Maximum Offset from Alignment: 1/4 in
- E. Maximum Out-of-Position: 1/4 in

3.5 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Requirements for inspecting and testing
- B. Welding: Inspect welds according to AWS D1.1
- C. Replace damaged or improperly functioning hardware
- D. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes
- E. Touch up factory-applied finishes according to manufacturer-recommended procedures

3.6 ADJUSTING

- A. Section 01 77 00 - Closeout Procedures
- B. Adjust operating hardware and lubricate as necessary for smooth operation

END OF SECTION

DIVISION 06 WOOD, PLASTICS, AND COMPOSITES

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes structural wall and roof framing; built-up structural beams and columns; wall, and roof sheathing; sill gaskets; and miscellaneous framing and sheathing.
- B. Related Sections:
 - 1. Section 06 10 53: Miscellaneous Rough Carpentry.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI A135.4 - Basic Hardboard.
 - 2. ANSI A208.1 - Mat-Formed Wood Particleboard.
- B. American Wood-Preservers' Association:
 - 1. AWPA M4 - Standard for the Care of Preservative-Treated Wood Products.
- C. AWPA ASTM International:
 - 1. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- D. The Redwood Inspection Service:
 - 1. RIS - Standard Specifications for Grades of California Redwood Lumber.
- E. Southern Pine Inspection Bureau:
 - 1. SPIB - Standard Grading Rules for Southern Pine Lumber.
- F. U.S. Department of Commerce National Institute of Standards and Technology:
 - 1. DOC PS 1 - Construction and Industrial Plywood.
 - 2. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
 - 3. DOC PS 20 - American Softwood Lumber Standard.
- G. West Coast Lumber Inspection Bureau:
 - 1. WCLIB - Standard Grading Rules for West Coast Lumber.
- H. Western Wood Products Association:
 - 1. WWPA G-5 - Western Lumber Grading Rules.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - 1. Lumber Grading Agency: Certified by DOC PS 20.
 - 2. Lumber: DOC PS 2 Apply label from agency approved by authority having jurisdiction to identify each preservative treated material.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Protect trusses from warping or other distortion by stacking in vertical position, braced to resist movement.

PART 2 PRODUCTS

2.1 LUMBER MATERIALS

- A. Lumber Grading Rules: NLGA RIS SPIB WCLIB WWPA or NELMA.
- B. Beam Framing: Douglas Fir - Larch grade, No 2 or better, 19 percent maximum moisture content.
- C. Parallel Strand Lumber (PSL) – Weyerhaeuser 2.0E Parallam.
- D. Joist Framing: Douglas Fir - Larch grade, No 2 or better, 19 percent maximum moisture content.
- E. Non-structural Light Framing: Douglas Fir - Larch grade, No 2 or better, 19 percent maximum moisture content.
- F. Studding: Douglas Fir - Larch grade, No 2 or better, 19 percent maximum moisture content.
- G. Miscellaneous Framing: Douglas Fir - Larch grade, No 2 or better, 19 percent maximum moisture content, pressure preservative treat where required by code.

2.2 SHEATHING MATERIALS

- A. Wood Structural Panel Roof Sheathing: EWA Rated Sheathing; Plywood Oriented Strand Board Span Rating as noted on structural drawings; Exposure Durability 1 exterior; unsanded.
- B. Particleboard Roof Sheathing: ANSI A208.1 Waferboard Structural Particleboard; wood chips shavings flakes set with waterproof resin binder; grade as noted on structural drawings; unsanded faces.
- C. Wood Structural Panel Wall Sheathing: EWA Rated Sheathing, Plywood Oriented Strand Board; Span Rating as noted on structural drawings; Exposure Durability 1 Exterior; unsanded.
- D. Particleboard Wall Sheathing: ANSI A208.1 EWA Waferboard Structural Particleboard; wood chips, shavings, and flakes set with waterproof resin binder; grade as noted on structural drawings; unsanded faces.

2.3 SHEATHING AND UNDERLAYMENT LOCATIONS

- A. Sloped Roof Sheathing: 19/32 inches thick; Span Rating: 40/20; 48 x 96 inch sized sheets, square edges.
- B. Wall Sheathing: 7/16 inch thick, Span Rating 32/16, 48 x 96 inch sized sheets, square edges.
- C. Floor Sheathing: 3/4 inch thick, Span Rating 40/20, 48 x 96 inch sized sheets, square edges.
- D. Underlayment: 3/8 inch thick, type recommended by flooring manufacturer

2.4 FIREBLOCKING AND DRAFTSTOPPING

- A. Fireblocking: Solid lumber, structural wood panel, or particleboard.
 - 1. Solid lumber nominal 2 inches thick.
 - 2. Two layers of solid lumber nominal 1 inch thick with broken lapped joints.
 - 3. Structural wood panel 23/32 inch thick with joints backed by structural wood panel.
 - 4. Particleboard 3/4 inch thick with joints backed by particleboard.

2.5 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Fasteners: ASTM A153/A153M, hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
 - 2. Nails and Staples: ASTM F1667.
 - 3. Drywall Screws: Bugle head, hardened steel, power driven type, length to achieve full penetration of sheathing substrate.
 - 4. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.
- B. Die Stamped Connectors: inch thick, hot dipped galvanized steel.
- C. Structural Framing Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
- D. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, glass fiber strip.
- E. Subfloor Glue: EWA AFG-01, waterproof of water base, air cure type, and cartridge dispensed.
- F. Building Paper: ASTM D226; Type I, No. 15 unperforated asphalt felt.

PART 3 EXECUTION

3.1 FRAMING

- A. Set structural members level and plumb, in correct position.
- B. Make provisions for erection loads, for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
- C. Place horizontal members, crown side up.
- D. Construct load bearing framing and curb members full length without splices.
- E. Double members at openings over inches wide. Space short studs over and under opening to stud spacing.
- F. Construct double joist headers at floor and ceiling openings and under wall stud partitions parallel to floor joists. Frame rigidly into joists.
- G. Bridge joists at mid-span. Fit solid blocking at ends of members.
- H. Place sill gasket directly on cementitious foundation. Puncture gasket clean and fit tight to protruding foundation anchor bolts.
- I. Coordinate installation of glue laminated structural units, prefabricated wood trusses, and wood "I" joists.
- J. Coordinate curb installation with installation of roof sheathing roofing and vapor retardant.

3.2 SHEATHING

- A. Secure roof sheathing with longer edge (strength axis) perpendicular to framing members and with ends staggered and sheet ends over bearing.
- B. Use sheathing clips between sheets between roof framing members. Install solid edge blocking between sheets.

- C. Secure wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered. Place building air barrier over wall sheathing; weather lap edges and ends.
- D. Install plywood to simple span.

3.3 FIREBLOCKING AND DRAFTSTOPPING

- A. Install fireblocking to cut off concealed draft openings.
 - 1. Concealed Framed Wall and Furred Spaces: Install fireblocking vertically at floor and ceiling levels and horizontally at maximum 10 feet on center.
 - 2. Connections Between Horizontal and Vertical Spaces: Install fireblocking between vertical walls and partitions and the following:
 - a. Horizontal roof framing.
 - b. Soffits, dropped ceilings, cove ceilings and other horizontal concealed spaces.
 - 3. Exterior Combustible Architectural Trim: Install fireblocking at maximum 20 feet on center

3.4 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances
- B. Framing Members: 1/4 inch from indicated position, maximum.
- C. Surface Flatness of Floor: 1/4 inch in 10 feet maximum, and 1/2 inch in 30 feet maximum.

END OF SECTION

SECTION 06 10 53

MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes perimeter nailers; blocking in wall and roof openings; wood furring and grounds; wall cabinets, wood trim; telephone and electrical panel back boards; and concealed wood blocking for support.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI A208.1 - Mat-Formed Wood Particleboard.
- B. American Wood-Preservers' Association:
 - 1. AWPA M4 - Standard for the Care of Preservative-Treated Wood Products.
- C. ASTM International:
 - 1. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- D. Forest Stewardship Council:
 - 1. FSC Guidelines - Forest Stewardship Council Guidelines.
- E. The Redwood Inspection Service:
 - 1. RIS - Standard Specifications for Grades of California Redwood Lumber.
- F. Southern Pine Inspection Bureau:
 - 1. SPIB - Standard Grading Rules for Southern Pine Lumber.
- G. U.S. Department of Commerce National Institute of Standards and Technology:
 - 1. DOC PS 1 - Construction and Industrial Plywood.
 - 2. DOC PS 20 - American Softwood Lumber Standard.
- H. West Coast Lumber Inspection Bureau:
 - 1. WCLIB - Standard Grading Rules for West Coast Lumber.
- I. Western Wood Products Association:
 - 1. WWPA G-5 - Western Lumber Grading Rules.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - 1. Lumber Grading Agency: Certified by DOC PS 20.
 - 2. Lumber: DOC PS 20.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Lumber Grading Rules: NLGA RIS SPIB WCLIB WWPA or NELMA.
- B. Miscellaneous Framing: Douglas Fir - Larch grade, No 1 or better, 19 percent maximum moisture content.
- C. Plywood: EWA Rated Sheathing; Plywood Oriented Strand Board Span Rating as noted on structural drawings; Exposure Durability 1 exterior; unsanded.

- D. Particleboard: ANSI A208.1 Waferboard Structural Particleboard; wood chips shavings flakes set with waterproof resin binder; grade as noted on structural drawings; unsanded faces.

2.2 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Fasteners: ASTM A153/A153M, hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
 - 2. Nails and Staples: ASTM F1667.
 - 3. Drywall Screws: Bugle head, hardened steel, power driven type, length to achieve full penetration of sheathing substrate.
 - 4. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

2.3 FACTORY WOOD TREATMENT

- A. Wood Preservative (Pressure Treatment): AWPA U1, Commodity Specification A-Sawn Products or F-Wood Composites using water-borne preservative.
- B. Wood Preservative (Surface Application): Clear , Fire Retardant Treatment: Chemically treated and pressure impregnated, having flame spread of 25 or less when tested in accordance with ASTM E 84 and showing no evidence of significant progressive combustion when test is continued for an additional 20 minute period, Interior Type.
- C. Moisture Content after Treatment: Kiln dried (KDAT).
 - 1. Lumber: Maximum 19 percent.
 - 2. Structural Panels: Maximum 15 percent.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Verification of existing conditions before starting work.
- B. Verify substrate conditions are ready to receive blocking, curbing and framing.

3.2 PREPARATION

- A. Coordinate placement of blocking, curbing and framing items.

3.3 INSTALLATION

- A. Set members level and plumb, in correct position.
- B. Place horizontal members, crown side up.
- C. Construct curb members of solid wood sections.
- D. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.
- E. Coordinate curb installation with installation of decking and support of deck openings, and roofing vapor retardant.
- F. Space framing and furring 16 inches oc.
- G. Secure sheathing to framing members with ends over firm bearing and staggered.
- H. Install telephone and electrical panel back boards with plywood sheathing material where required. Size back boards 12 inches beyond size of electrical and telephone panel.

END OF SECTION

SECTION 06 16 00

SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall sheathing.
 - 2. Floor Sheathing.
 - 3. Roof Sheathing.
 - 4. Parapet sheathing.
 - 5. Sheathing joint and penetration treatment.

1.2 ACTION SUBMITTALS

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: As tested in accordance with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 WALL SHEATHING

- A. Glass-Mat Gypsum Sheathing, Walls: ASTM C1177/C1177M.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation: Saint-Gobain North America.
 - b. Continental Building Products, LLC.
 - c. Georgia-Pacific Gypsum Company.
 - d. National Gypsum Company.
 - e. USG Corporation.
- B. Plywood Sheathing, Walls: PS 1-95
 - 1. As occurs per Structural Drawings.
 - 2. Span rating: Not less than 24/16
 - 3. Nominal Thickness: Not less than 7/16 inch

2.3 FLOOR SHEATHING

- A. Plywood Sheathing, Floor: PS 1-95
 - 1. Span rating: Not less than 48/24

2. Nominal Thickness: Not less than 23/32 inch

2.4 ROOF SHEATHING

- A. Plywood Sheathing, Roof: PS 1-95
 1. Span rating: Not less than 40/20
 2. Nominal Thickness: Not less than 19/32"

2.5 PARAPET SHEATHING

- A. Glass-Mat Gypsum Sheathing, Parapets: ASTM C1177/C1177M.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation: Saint-Gobain North America.
 - b. Georgia-Pacific Gypsum Company.
 - c. National Gypsum Company.
 - d. USG Corporation.
 2. Type and Thickness: Type X, 5/8 inch thick.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 1. For parapet and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Screws for Fastening Sheathing to Wood Framing: ASTM C1002.

2.7 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sealant for Glass-Mat Gypsum Sheathing: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated and complying with requirements for elastomeric sealants specified in Section 07 92 00 "Joint Sealants."
- B. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.
 1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. Table 2304.10.1, "Fastening Schedule," in the ICC's International Building Code.
 - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall and parapet sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 INSTALLATION OF WOOD STRUCTURAL PANEL

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Subflooring:
 - a. **Nail or staple** to wood framing.
 - b. Screw to cold-formed metal framing.
 - c. Space panels **1/8 inch** apart at edges and ends.
 - 2. Wall and Roof Sheathing:
 - a. **Nail or staple** to wood framing.
 - b. Space panels **1/8 inch** apart at edges and ends.

3.3 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to cold-formed metal framing with screws.
 - 2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - 3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

- B. Seal sheathing joints in accordance with sheathing manufacturer's written instructions.
 - 1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
 - 2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

END OF SECTION

SECTION 06 17 33

WOOD I-JOISTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes wood chord and plywood or particleboard web joists for roof framing; bridging, bracing and anchorage and framing for openings.
- B. Related Sections:
 - 1. Section 06 10 00 - Rough Carpentry.
 - 2. Section 06 10 53 - Miscellaneous Rough Carpentry.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. ASTM D2559 - Standard Specification for Adhesives for Structural Laminated Wood Products for use under Exterior (Wet Use) Exposure Conditions.
 - 3. ASTM D5055 - Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate sizes and spacing of joists, fastener description and spacing, loads, and framed openings. Submit design calculations.
- C. Product Data: Submit joist configurations, bearing and anchor details, bridging and bracing.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - 1. I-Joist Quality Assurance Agency.
- B. Joist Structural Capacities: Determine in accordance with ASTM D5055.
- C. Joists detailed and installed in accordance with current National Evaluation Report or ICBO Engineering Service Report.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Design joists and associated components under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

- B. Protect structural components from warping or other distortion by stacking in vertical position, braced to resist movement.

PART 2 - PRODUCTS

2.1 PLYWOOD I JOISTS

- A. Manufacturers:
 - 1. Georgia Pacific Corp.
 - 2. LP Building Products.
 - 3. Trus Joist MacMillan.
 - 4. Weyerhaeuser Engineered Stand Products
 - 5. Substitutions: Section 01 60 00 - Product Requirements.

2.2 MATERIALS

- A. Lumber Grading Rules: RIS. SPIB. WCLIB or WWPA.
- B. Wood Chord Members: Laminated Veneer Lumber (LVL) top and bottom chord,
- C. Particleboard Web: APA Oriented Strand Board set with waterproof resin binder; grade; unsanded faces.
- D. Joist Bridging: Type, size and spacing recommended by joist manufacturer.

2.3 ACCESSORIES

- A. Adhesive: ASTM D2559.
- B. Wood Blocking Plating Support Members Framing for Openings: In accordance with Section 06 10 53.
- C. Fasteners and Anchors:
 - 1. Fasteners: ASTM A153/A153M, F hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
 - 2. Nails and Staples: ASTM F1667.
 - 3. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete.

2.4 FABRICATION

- A. Fabricate joists to achieve structural requirements specified.
- B. Brace members for support during transit.
- C. Frame special sized openings in web as indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify supports and openings are ready to receive joists.

3.2 PREPARATION

- A. Coordinate placement of bearing or support items.

3.3 ERECTION

- A. Set structural members level and plumb, in correct position.
- B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb, and in alignment until completion of erection and installation of permanent bracing.
- C. Do not field cut or alter structural members without approval of Architect/Engineer.
- D. Place headers and supports to frame openings.
- E. Frame openings between joists with lumber in accordance with Section 06 10 00.
- F. Coordinate placement of sheathing with Work of this section.

3.4 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Framing Members: 1/2 inch maximum, from indicated position.

END OF SECTION

SECTION 06 41 00

ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Custom casework.
 - a. Plastic laminate finished casework.
 - 2. Counter tops.
 - a. Plastic laminate finished counter tops.
 - b. Synthetic surfacing counter tops
 - c. Metal Finished Counter Tops
 - 3. Cabinet hardware.
- B. Related Requirements:
 - 1. Section 06 10 53 - Miscellaneous Rough Carpentry: Grounds and support framing.
 - 2. Section 06 20 00 - Finish Carpentry.

1.2 REFERENCE STANDARDS

- A. American National Standards Institute:
 - 1. ANSI A135.4 - Basic Hardboard.
 - 2. ANSI A156.9 - Cabinet Hardware.
- B. APA - The Engineered Wood Association:
 - 1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.
- C. Architectural Woodwork Institute, Woodwork Institute:
 - 1. AWS - Architectural Woodwork Standards.
 - 2. Supplemented with The WI Approach.
- D. ASTM International:
 - 1. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. ASTM D1037 - Standard Test Methods for Evaluating Properties of Wood Base Fiber and Particle Panel Materials.
 - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 4. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- E. Hardwood Plywood and Veneer Association:
 - 1. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood.
- F. National Electrical Manufacturers Association:
 - 1. NEMA LD 3 - High-Pressure Decorative Laminates.
- G. National Fire Protection Association:
 - 1. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- H. U.S. Department of Commerce National Institute of Standards and Technology:
 - 1. DOC PS 20 - American Softwood Lumber Standard.

- I. Western Red Cedar Association:
 - 1. WRCA - Lumber Grades and Standards.
- J. Window and Door Manufacturers Association:
 - 1. WDMA I.S.4 - Water-Repellent Treatment for Millwork.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals, including AWS Section 1.
- B. Product Data: Submit data on:
 - 1. High-pressure decorative laminates.
 - 2. Hardware accessories.
- C. Shop Drawings:
 - 1. Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location, schedule of finishes, and Certified Compliance Label on each set.
- D. Samples:
 - 1. Submit two, 6 x 6 in samples, illustrating cabinet finish.
 - 2. Submit two, 6 x 6 in samples, illustrating counter top finish.
- E. Qualification Statements:
 - 1. Submit qualifications for fabricator.

1.4 QUALITY ASSURANCE

- A. Perform Work according to Architectural Woodwork Institute, Woodwork Institute; premium grade.

1.5 QUALIFICATIONS

- A. Fabricator: Company specializing in fabricating products specified in this Section with minimum five years' documented production experience similar to this Project.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Protect units from moisture damage.

1.7 AMBIENT CONDITIONS

- A. Section 01 73 00 - Execution: Requirements for ambient conditions control facilities for product storage and installation.
- B. Maintain storage space relative humidity within ranges indicated in AWS Section 2.
- C. Subsequent Conditions: Maintain same temperature and humidity conditions in building spaces as will occur after occupancy during and after installation of Work of this Section.

1.8 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 CUSTOM CASEWORK

- A. Casework Construction Details:
 - 1. Drawer Side Joinery: Doweled.
 - 2. Drawer and Door Edge Profile: Square with thin, applied vinyl band.
 - 3. Toe Base Finish: As indicated on the drawings.
- B. Plastic Laminate Finished Counter Tops: AWS Section 11; premium grade.
 - 1. Core: Particleboard.
 - a. Core at Sink Tops: Exterior or exterior glue type panels.
 - 2. Splash Top Profile: Square with scribe.
 - 3. Deck at Splash Joint Type: Vertical butt.
 - 4. Front Edge: Synthetic Surfacing.
 - 5. Splash Assembly: Field assembled.
- C. Synthetic Surfacing Counter Tops: AWS Section 11; premium grade.
 - 1. Nominal sheet thickness: Indicated on Drawings.
 - 2. Splash Top Profile: Square with scribe.
 - 3. Deck at Splash Joint Type: Vertical butt.
 - 4. Front Edge: Match counter top.
 - 5. Splash Assembly: Field assembled.
- D. Metal Finished Counter Tops
 - 1. Nominal sheet thickness: 24 gauge sheet metal.
 - 2. Core: $\frac{3}{4}$ inch Plywood or Particleboard.
 - a. Core at Sink Tops: Exterior or exterior glue type panels.
 - 3. Splash Top Profile: Square with scribe.
 - 4. Deck at Splash Joint Type: Vertical butt.
 - 5. Front Edge: Hemmed edges sheet metal.
 - 6. Splash Assembly: Field assembled.

2.2 INTERIOR FINISH CARPENTRY

- A. Shelving: Softwood lumber.
 - 1. Melamine Coated Particleboard Shelving.
 - a. Edging: Applied Vinyl thin band
 - b. Band Width: Match Shelf thickness

2.3 CASEWORK MATERIALS

- A. Softwood Lumber: DOC PS 20; WI Custom maximum moisture content of 6-8 percent
 - 1. Species: Douglas fir - Larch or Pine.
 - 2. Cut: Plain sawn.
- B. Hardwood Lumber: DOC PS 20. WI Premium Grade; maximum moisture content of 6-8 percent.
 - 1. Species:

- a. Stained finish – Red Oak
 - b. Painted finish - Poplar
- 2. Cut: Plain sawn.
- C. Softwood Plywood: APA/EWA PS 1 softwood plywood with lumber core and the following:
 - 1. Grade: C-D
 - 2. Face Veneer: Douglas Fir
 - 3. Veneer Slicing: Rotary.
 - 4. Matching of Individual Leaves to Each Other: Book matching.
 - 5. Matching Across Panel Face: Center balanced matching.
 - 6. Matching or Relationship of Panels to Each Other: Sequence-matched, uniform-size sets matching.
- D. Hardwood Plywood: AWI Grade AA veneer; WI Premium veneer; with lumber core; and the following:
 - 1. Grade: A-A
 - 2. Face Veneer: Red Oak
 - 3. Veneer Slicing: Rotary.
 - 4. Matching of Individual Leaves to Each Other: Book matching.
 - 5. Matching Across Panel Face: Center balanced matching.
 - 6. Matching or Relationship of Panels to Each Other: Sequence-matched, uniform-size sets matching.
- E. Compacted Laminate Panel: Laboratory Grade, Double Faced, NEMA LD3-2005, Grade CGS, Thickness as indicated on drawings
- F. Medium-Density Fiberboard: ANSI A208.2, composed of wood fibers, medium density.
- G. Medium-Density Overlay: APA/EWA PS 1; softwood plywood, exterior type, with paper face suitable for opaque finish.
- H. Hardboard: AHA A135.4; pressed wood fiber with resin binder, tempered grade, 1/4 in thick, smooth one side.
- I. High-Pressure Decorative Laminate (HPDL): NEMA LD 3; color, pattern, and surface texture as selected or as specified on Drawings.
 - 1. Horizontal Surfaces: HGS; 0.048 in thick.
 - 2. Vertical Surfaces: VGS; 0.028 in thick.
 - 3. Cabinet Liner: CLS; 0.020 in thick.
 - 4. Backing Sheet: BKL; 0.020 in thick.
- J. Sheet Metal Components: Stainless steel, Type 304 with No. 4 satin finish; 20 gauge.
- K. Synthetic Surfacing: Synthetic marble of polyester or proprietary resins, with integral color and design, stain resistant to domestic chemicals and cleaners.
 - 1. Manufacturers
 - a. Wilsonart International.
 - b. Gibraltar® Solid Surface.
 - c. DuPont Company: Corian.
 - d. Substitutions: Section 01 60 00 - Product Requirements.

2.4 FABRICATION

- A. Fabricate casework to AWS Section 10 premium grade.
- B. Fabricate counter tops to AWS Section 11 premium grade.

- C. Shop-assemble casework for delivery to Site in units easily handled and to permit passage through building openings.
- D. Fit exposed plywood edges with PVC plastic edging. Use one piece for full length only.
- E. Cap exposed high-pressure decorative laminate finish edges with PVC plastic trim.
- F. Door and Drawer Fronts: 3/4 in thick.
- G. When necessary to cut and fit on-Site, fabricate materials with ample allowance for cutting. Furnish trim for scribing and Site cutting.
- H. Apply high-pressure decorative laminate finish in full, uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Locate plastic laminate joints minimum 18 in from sink cutouts.
- I. Apply laminate backing sheet to reverse side of plastic- laminate-finished surfaces where required by AWS for specified grade.
- J. Fabricate metal counter top surfaces pressure glued to plywood or particle board core backing without visible joints.
- K. Fabricate cabinets and counter tops with cutouts for plumbing fixtures, inserts, outlet boxes, fixtures, and fittings. Verify locations of cutouts from on-Site dimensions. Seal cut edges.

2.5 FINISHES

- A. Sand Work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler matching surrounding surfaces and types recommended for applied finishes.
- D. Prime paint or seal surfaces in contact with cementitious materials.
- E. Finish according to Section 09 90 00 - Painting and Coating.

2.6 ACCESSORIES

- A. Adhesive for High-Pressure Decorative Laminates: Type recommended by laminate manufacturer to suit application.
- B. Fasteners and Anchors:
 1. Fasteners: ASTM B695, Class 55 mechanically galvanized steel for high-humidity and treated wood locations, unfinished steel elsewhere.
 2. Nails and Staples: ASTM F1667.
- C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; chrome finish in concealed locations and chrome finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Grommets: Plastic material for cut-outs.
 1. Size: As shown on the drawings
- F. Plastic Edge Trim: AWS; standard PVC; color as selected.
- G. Glass: Type as specified in Section 08 80 00 - Glazing.

2.7 HARDWARE

- A. Cabinet Adjustable Shelf Supports: In-line bored holes 1-3/8 in o.c., to within 6 in of top and bottom of opening with four support pins for each shelf.
 - 1. Vinyl coated steel, pin size 4.7 mm x 5/16".
 - 2. Quality Standard – Knappe & Vogt 348
- B. Shelf Standards and Rests: Formed steel channels and rests, cut for fitted rests spaced as shown on drawings;
 - 1. Finish: as selected
 - 2. Quality Standard – Knappe & Vogt 255 and 256.
- C. Shelf Brackets: Formed steel brackets, formed for attachment with lugs;
 - 1. Size: As shown on the drawings.
 - 2. Finish: Chrome.
 - 3. Quality Standard – Knappe & Vogt Super duty standard and brackets.
- D. Drawer and Door Pulls:
 - 1. Type: U-shaped pull.
 - 2. Size and Spacing: 4 inch centers.
 - 3. Finish: Solid stainless steel with satin finish.
- E. Cabinet Locks:
 - 1. Type: Pin tumbler type suitable for location.
 - 2. Keying: Key locks separately. Stamp keys consecutively beginning with "1". Key to facility master key.
 - 3. Quality Standard: Schlage CL-series.
- F. Catches:
 - 1. Plastic case, magnet type.
 - 2. Quality Standard – Hafele 246.50.708.
- G. Drawer Slides: Self-closing, galvanized steel construction, ball bearings separating tracks, rail mounted full extension type.
 - 1. Load Rating: 100lb for standard drawers, 150lbs for lateral file.
 - 2. Quality Standards –
 - a. Standard Drawers – Accuride 3832.
 - b. Lateral Files – Accuride 4005.
- H. Hinges:
 - 1. European style, free swinging
 - 2. Quality Standard – Grass 2-Dimensional Series.
- I. Counter Top Supports Brackets: Powdercoated 1008 Cold Rolled Steel.
 - 1. Size 20 inches x 20 inches
 - 2. Load Rating: 1000 pounds per a pair based 16 inches on center.
 - 3. Quality Standard: Federal Brace 326

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Requirements for installation examination.
- B. Verify adequacy of backing and support framing.
- C. Verify location and sizes of utility rough-in associated with Work of this Section.

3.2 PREPARATION

- A. Section 01 73 00 - Execution: Requirements for installation preparation.

3.3 INSTALLATION

- A. Install casework according to AWS Section 10 premium grade.
- B. Install counter tops according to AWS Section 11 premium grade.
- C. Caulk all joints between backsplash and counter top. Color to match counter top.
- D. Caulk all joints between backsplash, counter top and walls. Color to match counter top.
- E. Set and secure casework, interior finish carpentry, and counter tops in place; rigid, plumb, and level.
- F. Use fixture attachments in concealed locations for wall-mounted components.
- G. Use concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
- H. Carefully scribe casework abutting other components, with maximum gaps of 1/32 in. use additional overlay trim for this purpose.
- I. Secure woodwork cabinet and counter bases to floor using appropriate angles and anchorages.
- J. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- K. Site glaze glass materials using interior dry method specified in Section 08 80 00 - Glazing.

3.4 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Requirements for tolerances.
- B. Maximum Variation from Indicated Position: 1/16 in.
- C. Maximum Offset from Alignment with Abutting Materials: 1/32 in.

3.5 ADJUSTING

- A. Section 01 73 00 - Execution: Requirements for starting and adjusting.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.6 CLEANING

- A. Section 01 73 00 - Execution and Section 01 77 00 - Closeout Procedures: Requirements for cleaning.
- B. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF DIVISION

SECTION 06 64 00

PLASTIC PANELING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes plastic sheet paneling.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For plastic paneling and trim accessories.

PART 2 - PRODUCTS

2.1 PLASTIC SHEET PANELING

- A. Glass-Fiber-Reinforced Plastic Paneling (FRP-1): Gelcoat-finished, glass-fiber-reinforced plastic panels complying with ASTM D5319.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Crane Composites, Inc.
 - b. Glasteel.
 - c. Marlite.
 - d. Newcourt, Inc.
 - e. Nudo Products, Inc.
 - f. Parkland Plastics, Inc.
 - 2. Surface-Burning Characteristics: As follows when tested by a qualified testing agency in accordance with ASTM E84. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 3. Nominal Thickness: Not less than 0.075 inch.
 - 4. Surface Finish: Molded pebble texture
 - 5. Color: White

2.2 ACCESSORIES

- A. Trim Accessories: Manufacturer's standard one-piece vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.
 - 1. Color: White.
- B. Sealant: Mildew-resistant, single-component, neutral-curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that could impair adhesive bond, including oil, grease, dirt, and dust.
- B. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.
- C. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels.

3.2 INSTALLATION

- A. Install plastic paneling according to manufacturer's written instructions.
- B. Install panels in a full spread of adhesive.
- C. Install trim accessories with adhesive.
- D. Fill grooves in trim accessories with sealant before installing panels, and bed inside corner trim in a bead of sealant.
- E. Maintain uniform space between panels and wall fixtures. Fill space with sealant.
- F. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION

SECTION 06 65 00

SOLID SURFACING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid Surface Material, counter tops and accessories.

1.2 SYSTEM DESCRIPTIONS

- A. Homogenous sheet material composed of acrylic resins, fire-retardant filler materials, and coloring agents.

1.3 SUBMITTALS

- A. Comply with Section 01 33 00, unless otherwise indicated.
- B. Product Data:
 - 1. Detailed specification of construction and fabrication.
 - 2. Manufacturer's installation instructions.
 - 3. Manufacturer's detailed recommendations for handling, storage, installation, protection, and maintenance.
- C. Shop Drawings: Installation details including location and layout of each type of fabrication and accessory.
- D. Samples: Full range of colors and patterns.
- E. Contract Closeout Submittals: Comply with Section 01 77 00.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Certified solid surface fabricator/installer.
- B. Installer Qualifications: Firm experienced in installation or application of systems similar in complexity to those required for this Project, including specific requirements indicated.
 - 1. Acceptable to or licensed by manufacturer.
- C. Source Limitations: Obtain materials and products from single source.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fabrications appropriately wrapped in protective materials.
- B. Protect fabrications from damage.

1.6 PROJECT CONDITIONS

- A. Maintain relative humidity planned for building occupants and an ambient temperature between 65 and 75 degrees Fahrenheit for 48 hours prior to and during installation.
After

- B. Installation, maintain relative humidity and ambient temperature planned for building occupants.

1.7 WARRANTY

- A. Furnish manufacturer's limited 10 year warranty.

PART 2 PRODUCTS

2.1 PRODUCTS

A. MANUFACTURER

1. Avonite Surfaces
2. Corian
3. Formica Corporation
4. LG Chemical, Ltd.
5. Meganite, Inc.
6. Wilsonart International. Gibraltar® Solid Surface.
7. Substitutions: Section 01 60 00 - Product Requirements.

2.2 COMPONENT

A. SOLID SURFACE SHEET

1. Nominal sheet thickness: Indicated on Drawings.
2. Surface burning characteristics in accordance with ASTM E84: Class I or A, and as follows:
3. Flame spread: <25.
4. Smoke developed: <25.
5. Liquid Absorption, ISO 4586-2, for ½ inch material thickness: 0.4 percent after 2 hour period.
6. Izod Impact, ASTM D256, Method A: 0.3 foot pounds per inch.
7. Tensile Modulus, ASTM D638 Nominal: ½ million pounds per square inch.
8. Thermal Expansion, ASTM D696: 0.000018 inch per inch per degree F, maximum.
9. Hardness, ASTM D 2583, Barcol Impressor: 57.
10. Flexural Toughness, ASTM D790, 3 (in.-lb./in³).
11. Deflection Temperature under load, ASTM D648: 90 degrees C.
12. Stain Resistance, ANSI Z-124.3 Modified; 3.4: No effect.
13. Boiling Water Resistance, NEMA LD 3-3.05: No effect.
14. High Temperature Resistance, NEMA LD 3-3.06: No effect.
15. Radiant Heat Resistance, NEMA LD 3-3.10: No effect.
16. Light Resistance, NEMA LD 3-3.03: No effect.
17. Ball Impact Resistance, NEMA LA 3-3.08, one half pound ball, unsupported: 125 inches.
18. Specific Gravity (Density ASTM D792): 1.60 grams per cubic centimeter.
19. Approximate weight: 4.20 pounds per square foot.
20. Weatherability, ASTM D2565: Pass.
21. Fungus Resistance, ASTM G21: Pass.
22. Bacterial Resistance, ASTM G22: Pass.
23. Pittsburgh Protocol Toxicity: 66.9 grams.
24. Patterns and Finishes: Selected from manufacturer's full range of available selections.

2.3 FABRICATIONS

- A. Fabrication to be performed by a certified solid surface fabricator/installer.
- B. Fabricate components in shop to greatest extent practical to size and shape indicated, in accordance with approved shop drawing and manufacturer's published requirements.
- C. Form joints between components using manufacturer's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Attach 4" wide reinforcing strip under joints.
- D. Provide holes and cutouts for plumbing and bath accessories as indicated on shop drawings.
- E. Rout and finish component edges to a smooth, uniform finish. Rout all cutouts then sand all edges smooth. Repair or reject defective or inaccurate work.
- F. Finish: Surfaces shall have a uniform finish:
 - 1. Matte: Standard finish for high traffic areas, requires the least amount of maintenance.
- G. Thermoforming (optional): Comply with forming data from manufacturer:
 - 1. Construct matching molds to form components shapes.
 - 2. Form pieces to shape prior to seaming and joining.
 - 3. Cut pieces larger than finished dimensions, sand edges, remove all nicks and scratches.
 - 4. Heat entire component uniformly between 280 - 325 degrees Fahrenheit during forming.
 - 5. Prevent blistering, whitening or cracking of solid surface material during forming.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surfacing. Identify conditions detrimental to proper or timely installation. Do not commence installation until conditions have been corrected.

3.2 PREPARATION

- A. Precondition Solid Surfacing in accordance with manufacturer's printed installation instructions.

3.3 INSTALLATION

- A. Install components plumb and level, in accordance with approved shop drawings, project installation details and manufacturer printed instructions.
- B. Form joints using manufacturer's approved adhesive, with joints inconspicuous in finished work.
- C. Provide backsplashes and end splashes as indicated on the drawings. Adhere to countertops using manufacturer's recommended silicone sealant.
- D. Remove excessive adhesive and sealants. Components shall be clean on date of Substantial Completion.

E. Coordinate plumbing installation with Division 22.

3.4 PROTECTION

A. Protect surfaces from damage until date of Substantial Completion. Repair or replace damaged components that cannot be repaired to architect's satisfaction.

B. Fabricator/Installer to provide the Owner a manufacturer's maintenance kit, review maintenance procedures and the manufacturer warranty with the Owner upon completion of the project.

END OF DIVISION

DIVISION 7 THERMAL AND MOISTURE PROTECTION

SECTION 07 01 40

SELECTIVE DEMOLITION OF ROOFING MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolishing designated roofing materials, flashing, and metal trim
 - 2. Cutting and alterations for completion of the Work
 - 3. Protecting items designated to remain
 - 4. Removing demolished materials
- B. Related Sections:
 - 1. Section 07 53 03 - Elastomeric Membrane Roofing

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals
- B. Demolition Schedule: Indicate overall schedule and interruptions required for utility and building services

1.3 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 – Closeout Procedures: Requirements for submittals
- B. Project Record Documents: Accurately record actual locations of capped utilities, concealed utilities discovered during demolition, and subsurface obstructions
- C. Operation and Maintenance Data: Submit description of system, inspection data, and parts lists

1.4 QUALITY ASSURANCE

- A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection
- B. Conform to applicable code for procedures when hazardous or contaminated materials are discovered
- C. Obtain required permits from authorities having jurisdiction
- D. Conform to Agency policies for demolition work, dust control, notification of disruption of HVAC and electrical systems and re-connection

1.5 SEQUENCING

- A. Section 01 10 00 - Summary: Requirements for sequencing.
- B. Sequence demolition activities to remove no more roofing materials than can be replaced in the same work day
- C. Owner will conduct salvage operations before demolition begins to remove materials Owner chooses to retain

1.6 SCHEDULING

- A. Section 01 31 00 – Project Management and Coordination.

- B. Schedule Work to coincide with new construction
- C. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation and in adjoining spaces

1.7 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with occupied building areas
- B. Cease operations immediately if structure appears to be in danger and notify Architect
 1. Do not resume operations until directed

PART 2 - PRODUCTS - Not Used.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Notify Owner and Agency before starting work and comply with their requirements
- B. Mark location and termination of utilities
- C. Erect, and maintain temporary barriers and security devices, including warning signs and lights, and similar measures, for protection of the occupants, public, Owner, and existing improvements indicated to remain
- D. Do not close or obstruct building egress path
- E. Do not disable or disrupt building fire or life safety systems without 3weeks prior written notice to Owner

3.2 SALVAGE REQUIREMENTS

- A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner
- B. Tag components and equipment Owner designates for salvage
- C. Protect designated salvage items from demolition operations until items can be removed
- D. Carefully remove building components and equipment indicated to be salvaged
- E. Disassemble as required to permit removal from building
- F. Package small and loose parts to avoid loss
- G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item
- H. Prepare assembly instructions consistent with disassembled parts
 1. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item
- I. Deliver salvaged items to Owner
- J. Obtain signed receipt from Owner

3.3 DEMOLITION

- A. Conduct demolition to minimize interference with occupied building areas
- B. Do not conduct demolition in adverse weather conditions
 1. Cease operations immediately when adverse weather condition appear and protect

- 2. all demo areas to prevent water and other infiltration entering the building
- 2. Comply with roofing manufacturer requirement regarding weather condition
- C. Do not close or obstruct roadways sidewalks without Agency permission
- D. Cease operations immediately when structure appears to be in danger and notify Architect
- E. Protect existing structural roof deck from damage during demolition of roofing materials
- F. Disconnect and remove designated utilities within demolition areas
- G. Cap and identify abandoned utilities at termination points when utility is not completely removed
 - 1. Annotate Record Drawings indicating location and type of service for capped utilities remaining after demolition
- H. Demolish in orderly and careful manner.
 - 1. Protect existing improvements and supporting structural members
- I. Carefully remove building components indicated to be reused
 - 1. Disassemble components as required to permit removal
 - 2. Package small and loose parts to avoid loss
 - 3. Mark components and packaged parts to permit reinstallation
 - 4. Store components, protected from construction operations, until reinstalled
- J. Remove demolished materials from site
 - 1. Remove materials as Work progresses
 - 2. Remove demolished materials from the site weekly
 - 3. Do not allow demolished materials to accumulate on site
 - 4. Do not burn or bury materials on site
 - 5. Demolished materials shall be store in covered container
- K. Upon completion of Work, leave areas in clean condition
- L. Remove temporary Work.

3.4 PROTECTION OF EXISTING FACILITIES

- A. Section 01 73 00 - Execution and Section 01 77 00 - Closeout Requirements: Protecting existing construction
- B. Protect Owner and Agency property from water and other infiltration during all demolition and installation of all roofing materials
- C. Damage to Owner and Agency property shall be repaired, or replaced at Contractor expense

END OF SECTION

SECTION 07 11 00

DAMPPROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes cold applied asphalt emulsion dampproofing.

1.2 REFERENCES

- A. ASTM International:
 1. ASTM D41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing and Waterproofing
 2. ASTM D449 - Standard Specification for Asphalt Used in Dampproofing and Waterproofing
 3. ASTM D1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing
 4. ASTM D3747 - Standard Specification for Emulsified Asphalt Adhesive for Adhering Roof Insulation
 5. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free
- B. National Roofing Contractors Association:
 1. NRCA - The NRCA Waterproofing and Dampproofing Manual

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit properties of primer and asphalt emulsion

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements
- B. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until membrane has cured

PART 2 PRODUCTS

2.1 COMPONENTS

- A. Cold Asphaltic Materials:
 1. Asphalt Emulsion: Conforming to ASTM D3747
 2. Emulsified Asphalt: ASTM D1227; Type II Class 1 or Class II reinforced with non-asbestos fibers
 3. Asphalt Primer: ASTM D41, compatible with substrate

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions

- B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system
- C. Verify items penetrating surfaces to receive dampproofing are securely installed

3.2 PREPARATION

- A. Protect adjacent surfaces not designated to receive dampproofing
- B. Clean and prepare surfaces to receive dampproofing
- C. Do not apply dampproofing to surfaces unacceptable to manufacturer or applicator
- D. Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate

3.3 INSTALLATION

- A. Prime surfaces in accordance with NRCA - Waterproofing Manual
- B. Apply asphalt emulsion with roller
- C. Apply bitumen in one coat, continuous and uniform, at rate of 2 gal/100 sq ft.
- D. Apply from 2 inches below finish grade elevation to top of footings
- E. Seal items Projecting through dampproofing surface with mastic
- F. Seal watertight
- G. Immediately backfill against dampproofing to protect from damage

END OF SECTION

SECTION 07 21 13

BOARD INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes rigid board insulation at perimeter foundation wall, exterior wall behind gypsum board wall finish, horizontally under slab at foundation perimeter, and above ceiling insulation board.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete: Board insulation at perimeter foundation wall
 - 2. Section 07 21 16 - Blanket Insulation
 - 3. Section 09 21 16 - Gypsum Board Assemblies: Board insulation behind gypsum board wall finish

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
 - 2. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics
 - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
- B. Scientific Certification Systems (SCS):
 - 1. SCS Recycled Content Certification.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit data on product characteristics, performance criteria, limitations and, adhesives

1.4 QUALITY ASSURANCE

- A. Insulation Installed in Concealed Locations Surface Burning Characteristics:
- B. Foam Plastic Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84
- C. Insulation Installed in Exposed Locations Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements
- B. Do not install adhesives when temperature or weather conditions are detrimental to successful installation

1.6 SEQUENCING

- A. Section 01 10 00 - Summary: Work sequence

- B. Sequence Work to ensure firestopping materials are in place before beginning Work of this section

1.7 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination

PART 2 - PRODUCTS

2.1 BOARD INSULATION

- A. Manufacturers:
 - 1. ACH Foam Technologies, LLC
 - 2. DiversiFoam Products
 - 3. Dow Chemical Company
 - 4. Johns Manville
 - 5. Owens Corning
 - 6. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPONENTS

- A. Extruded Polystyrene Insulation (XPS): ASTM C578 Type VI; cellular type, conforming to the following:
 - 1. Board Size: 48 x 96 or 24 x 96 inch
 - 2. Board Thickness: 2 inches
 - 3. Thermal Resistance: R of 5.0 per inch
 - 4. Water Absorption: In accordance with ASTM D2842; 0.3 percent by volume maximum
 - 5. Compressive Strength: Minimum 25 psi
 - 6. Board Edges: Square edges
- B. Integrated Furring and Insulation System: Contractor's Option
 - 1. Expanded Polystyrene insulation with metal Z furring: ASTM C578; expanded cellular type, conforming to the following:
 - a. Manufacturers:
 - 1) Plymouth Foam Incorporated – Model: Gold-Wall
 - 2) Divers/Foam Products – Model: Certistud
 - 3) Substitutions: Section 01 60 00 - Product Requirements
 - b. Board Size: 4 x 8 feet
 - c. Board Thickness: 2 inches
 - d. Thermal Resistance: R of 8.0
 - e. Water Absorption: In accordance with ASTM C272 0.2 percent by volume maximum
 - f. Compressive Strength: Minimum 35 psi
 - g. Board Edges: Square edges
 - h. Furring Strips: 60 galvanized steel, 25 gauge, 24" on center

2.3 ACCESSORIES

- A. Adhesive: Type recommended by insulation manufacturer for application
- B. Tape: Type recommended by insulation manufacturer for application
- C. Insulation Fasteners: Impaling clip of galvanized steel with washer retainer and clips, to be mechanically fastened to surface to receive board insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions
- B. Verify substrate, adjacent materials, and insulation boards are dry and ready to receive insulation and adhesive
- C. Verify substrate surface is flat, free of honeycomb, fins, irregularities, materials or substances affecting adhesive bond

3.2 INSTALLATION - FOUNDATION PERIMETER

- A. Apply adhesive in three continuous beads per board length to full bed 1/8 inch thick
- B. Install boards on foundation wall perimeter, vertically or horizontally
- C. Place boards in method to maximize contact bedding
- D. Stagger side and end joints
- E. Butt edges and ends tight to adjacent board and to protrusions
- F. Extend boards over control or expansion joints, unbonded to foundation 6 inches on one side of joint
- G. Cut and fit insulation tight to protrusions or interruptions to insulation plane
- H. Immediately following application of board insulation, place protective boards over exposed insulation surfaces, apply adhesive in five continuous beads per board length
- I. Install boards horizontally or vertically from base of foundation to top of insulation
- J. Butt board joints tight; stagger from insulation joints

3.3 INSTALLATION - EXTERIOR WALLS

- A. Secure boards to substrate by mechanical attachment to achieve continuous flush insulation surface
- B. Fastener: 6 per insulation board
- C. Apply adhesive in three continuous beads per board length to full bed 1/8 inch thick
 - 1. Daub adhesive tight to protrusions
- D. Install boards on wall surface, vertically or horizontally
- E. Place boards in method to maximize contact bedding
 - 1. Stagger end joints. Butt edges and ends tight to adjacent board and to protrusions
- F. Cut and fit insulation tight to protrusions or interruptions to insulation plane
- G. Tape insulation board joints

3.4 INSTALLATION OF ABOVE CEILING INSULATION BOARD

- A. Product should be kept dry during shipping, storage, and installation.
- B. Board insulation shall be cut neatly with edges square to ceiling perimeters
- C. Insulation shall be loose laid on top of ceiling panel system
- D. Insure complete coverage of ceiling system
- E. Hold gaps between boards to less than 1/8"

- F. Cut boards around suspension wires as necessary to allow complete coverage of ceiling
- G. Insulation board shall be cut to set on top of each acoustical panel

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protection of installed construction
- B. Do not permit damage to insulation prior to covering

3.6 SCHEDULE

- A. Foundation and Crawl Space: 2 inch; Extruded Polystyrene Insulation (XPS)
- B. Exterior Walls, Exterior Face:
 - 1. XPS with "Z" furring framing support system

END OF SECTION

SECTION 07 21 16

BLANKET INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes batt insulation in exterior and interior wall construction and for filling perimeter window and door shim spaces, and crevices in exterior wall.
- B. Related Sections:
 - 1. Section 06 10 00 - Rough Carpentry; Wood stud framing
 - 2. Section 07 21 13 - Board Insulation.
 - 3. Section 07 27 26 - Fluid Applied Membrane: Air Barriers.
 - 4. Section 09 21 16 - Gypsum Board Assemblies: Acoustic batt insulation within wall.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - 2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 3. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.

1.3 SYSTEM DESCRIPTION

- A. Materials of This Section: Provide continuity of thermal barrier at building enclosure elements.

1.4 PERFORMANCE REQUIREMENTS

- A. Vapor Retarder Permeance: Maximum 1 perm when tested in accordance with ASTM E96/E96M.

1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on product characteristics, performance criteria, limitations.

1.6 QUALITY ASSURANCE

- A. Insulation Installed in Concealed Locations Surface Burning Characteristics:
 - 1. Batt Insulation: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.7 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.

PART 2 PRODUCTS

2.1 BATT INSULATION

- A. Manufacturers:

1. CertainTeed Insulation
2. Johns Manville.
3. Knauf Fiber Glass.
4. Owens Corning Fiberglas.
5. U.S. Gypsum Co. Thermafiber LLC.
6. Substitutions: Section 01 60 00 - Product Requirements.

2.2 COMPONENTS

- A. Batt Insulation: ASTM C665; preformed glass mineral fiber batt, roll, or blanket; conforming to the following:
 1. Walls
 - a. Thermal Resistance: R of 19.
 2. Roll Size: 16 inch.
- B. Staples: Steel wire; type and size to suit application.
- C. Tape: Polyethylene self-adhering type, mesh reinforced, 2 inch wide.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions.
- B. Verify substrate, adjacent materials, and insulation are dry and ready to receive insulation.

3.2 INSTALLATION

- A. Install in exterior walls and roof spaces without gaps or voids. Do not compress insulation.
- B. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- C. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.
- D. Staple or nail facing flanges in place at maximum 6 inches oc.
- E. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- F. Wood Framing: Place vapor retarder on warm side of insulation by stapling at 6 inches oc. Lap and seal sheet retarder joints over member face.
- G. Coordinate Work of this section with construction of air barrier seal specified in Section 07 27 26.

END OF SECTION

SECTION 07 25 00

WEATHER BARRIERS (Contractor's Option, in lieu of Section 07 27 26)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Weather barrier membrane
 - 2. Seam Tape
 - 3. Flashing
 - 4. Fasteners
- B. Related Sections:
 - 1. Section 07 90 00 - Joint Protection: Sealant materials and installation techniques
 - 2. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard and sheathing
 - 3. Section 08 41 13 - Aluminum-Framed Entrances and Store: Product requirements for window placement

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C920; Standard Specification for Elastomeric Joint Sealants
 - 2. ASTM C1193; Standard Guide for Use of Joint Sealants
 - 3. ASTM D882; Test Method for Tensile Properties of Thin Plastic Sheeting
 - 4. ASTM D1117; Standard Guide for Evaluating Non-woven Fabrics
 - 5. ASTM E84; Test Method for Surface Burning Characteristics of Building Materials
 - 6. ASTM E96; Test Method for Water Vapor Transmission of Materials
 - 7. ASTM E1677; Specification for Air Retarder Material or System for Framed Building Walls
 - 8. ASTM E2178; Test Method for Air Permeance of Building Materials
 - 9. ASTM E2357; Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- B. AATCC – American Association of Textile Chemists and Colorists
 - 1. Test Method 127 Water Resistance: Hydrostatic Pressure Test
- C. TAPPI
 - 1. Test Method T-410; Grams of Paper and Paperboard (Weight per Unit Area)
 - 2. Test Method T-460; Air Resistance (Gurley Hill Method)

1.3 PERFORMANCE REQUIREMENTS

- A. Provide continuity of air seal materials and assemblies in conjunction with materials described in other Sections

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit data on material characteristics, performance criteria, and limitations
 - 1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with indicated requirements
- C. Weather Barrier Warranty: Manufacturer's executed warranty form with authorized signatures and endorsements indicating date of Substantial Completion

1.5 QUALIFICATIONS

- A. Fabricator: Company specializing in fabricating products specified in this Section with minimum five years' documented production experience similar to this Project

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products
- B. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact
- C. Store weather barrier materials as recommended by weather barrier manufacturer

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements
- B. Maintain temperature and humidity recommended by materials manufacturers before, during and after installation

1.8 SEQUENCING

- A. Section 01 10 00 - Summary: Work sequence.
- B. Review requirements for sequencing of installation of weather barrier assembly with installation of windows, doors, louvers and flashings to provide a weather-tight barrier assembly
- C. Schedule installation of weather barrier materials and exterior cladding within nine months of weather barrier assembly installation

1.9 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions
- B. Coordinate the Work of this section with sections referencing this section

1.10 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Requirements for warranties
- B. Furnish ten (10) years manufacturer warranty for weather barrier from date of final weather barrier installation

PART 2 - PRODUCTS

2.1 WEATHER BARRIERS

- A. Manufacturers:
 - 1. DuPont (Tyvek)
 - 2. Grace Construction Products
 - 3. Rubber Polymer Corporation, Inc
 - 4. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPONENTS

- A. Sheet: Spun-bonded polyolefin, non-woven, non-perforated
 - 1. Performance Characteristics:
 - a. Air Penetration:
 - 1) 0.001 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2178

- 2) Type I per ASTM E1677
- 3) ≤ 0.04 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2357
- b. Water Vapor Transmission: 28 perms, when tested in accordance with ASTM E96, Method B
- c. Water Penetration Resistance: Minimum 280 cm when tested in accordance with AATCC Test Method 127
- d. Basis Weight: Minimum 2.7 oz/yd², when tested in accordance with TAPPI Test Method T-410
- e. Air Resistance: Air infiltration at >1500 seconds, when tested in accordance with TAPPI Test Method T-460
- f. Tensile Strength: Minimum 38/35 lbs/in., when tested in accordance with ASTM D882, Method A
- g. Tear Resistance: 12/10 lbs., when tested in accordance with ASTM D1117
- h. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84. Flame Spread: 10, Smoke Developed: 10

2.3 ACCESSORIES

- A. Seam Tape: As recommended by the weather barrier manufacturer
- B. Fasteners:
 - 1. 1-5/8 inch rust resistant screw with 2-inch diameter plastic cap or manufacturer approved 1-1/4" or 2" metal gasketed washer
- C. Sealants: Recommended by the weather barrier manufacturer
- D. Adhesives:
 - 1. Provide adhesive recommended by weather barrier manufacturer
 - 2. Products: Adhesives recommend by the weather barrier manufacturer
- E. Primers:
 - 1. Provide flashing manufacturer recommended primer to assist in adhesion between substrate and flashing
 - 2. Products: Primers recommended by the flashing manufacturer
- F. Flashing
 - 1. Flexible membrane flashing materials for window openings and penetrations recommended by manufacturer
 - 2. Straight flashing membrane materials for flashing windows and doors and sealing penetrations such as masonry ties, etc. recommended by manufacturer
 - 3. Thru-Wall flashing membrane materials for flashing at changes in direction or elevation (shelf angles, foundations, etc.) and at transitions between different assembly materials
 - 4. Preformed Inside and Outside Corners and End Dams: Preformed three-dimensional shapes to complete the flashing system used in conjunction with Thru-Wall Flashing

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions
- B. Verify substrate and surface conditions are in accordance with weather barrier manufacturer recommended tolerances prior to installation of weather barrier and accessories

3.2 INSTALLATION

- A. Weather Barrier

1. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations
 2. Install weather barrier prior to installation of windows and doors
 3. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap
 4. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level
 5. Sill Plate Interface: Extend lower edge of weather barrier over sill plate interface 3-6 inches. Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer
 6. Window and Door Openings: Extend weather barrier completely over openings.
 7. Overlap weather barrier
 - a. Exterior corners: minimum 12 inches
 - b. Seams: minimum 6 inches
 8. Weather Barrier Attachment:
 - a. Attach weather barrier to studs through exterior sheathing.
 - 1) Secure using weather barrier manufacturer recommend fasteners, space 12-18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally
 9. Apply flashing to weather barrier membrane prior to installing cladding anchors
- B. Seaming
1. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams
 2. Seal any tears or cuts as recommended by weather barrier manufacturer
- C. Window Flashing
1. Preparation
 - a. Flush cut weather barrier at edge of sheathing around full perimeter of opening.
 - b. Cut a head flap at 45-degree angle in the weather barrier at window head to expose 8 inches of sheathing
 - 1) Temporarily secure weather barrier flap away from sheathing with tape
 2. Flashing
 - a. Cut flexible flashing a minimum of 12 inches longer than width of sill rough opening
 - b. Cover horizontal sill by aligning flexible flashing edge with inside edge of sill
 - 1) Adhere to rough opening across sill and up jambs a minimum of 6 inches
 - 2) Secure flashing tightly into corners by working in along the sill before adhering up the jambs
 - c. Fan flexible flashing at bottom corners onto face of wall
 - 1) Firmly press in place. Mechanically fasten fanned edges
 - d. Apply 9-inch wide strips of flashing at jambs. Align flashing with interior edge of jamb framing
 - 1) Start flashing at head of opening and lap sill flashing down to the sill
 - e. Spray-apply primer to top 6 inches of jambs and exposed sheathing
 - f. Install flexible flashing at opening head using same installation procedures used at sill
 - 1) Overlap jamb flashing a minimum of 2 inches
 - g. Coordinate flashing with window installation
 - h. On exterior, install backer-rod in joint between window frame and flashed rough framing
 - 1) Apply sealant at jambs and head, leaving sill unsealed
 - 2) Apply sealants in accordance with sealant manufacturer's instructions and ASTM C1193
 - i. Position weather barrier head flap across head flashing
 - 1) Adhere using flashing over the 45-degree seams

- j. Tape top of window in accordance with manufacturer recommendations
 - k. On interior, install backer rod in joint between frame of window and flashed rough framing
 - 1) Apply sealant around entire window to create air seal.
 - 2) Apply sealant in accordance with sealant manufacturer's instructions and ASTM C1193
- D. Thru – Wall Flashing at window head
- 1. Cut flap in weather barrier at window head
 - 2. Prime exposed sheathing
 - 3. Install lintel as required. Verify end dams extend 4 inches minimum beyond opening
 - 4. Install end dams bedded in sealant
 - 5. Adhere 2 inches minimum thru-wall flashing to wall sheathing
 - a. Overlap lintel with thru-wall flashing and extend ¼ inch minimum beyond outside edge of lintel to form drip edge
 - 6. Apply sealant along thru-wall flashing edges
 - 7. Fold weather barrier flap back into place and tape bottom edge to thru-wall flashing
 - 8. Tape diagonal cuts of weather barrier
 - 9. Secure weather barrier flap with fasteners
- E. Thru – Wall Flashing
- 1. Apply primer per manufacturer's written instructions
 - 2. Install preformed corners and end dams bedded in sealant in appropriate locations along wall
 - 3. Starting at a corner, remove release sheet and apply membrane to primed surfaces in lengths of 8 to 10 feet
 - 4. Extend membrane through wall and leave ¼ inch minimum exposed to form drip edge
 - 5. Roll flashing into place ensuring continuous and direct contact with substrate
 - 6. Lap ends and overlap preformed corners 4 inches minimum. Seal all laps with sealant
 - 7. Terminate membrane on vertical wall
 - 8. Apply sealant bead at each termination

3.3 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution and Section 01 77 00 - Closeout Procedures: Protecting installed construction
- B. Do not permit adjacent work to damage work of this section

END OF SECTION

SECTION 07 27 26

FLUID-APPLIED WEATHER BARRIERS (Contractor's Option, in lieu of Section 07 25 00)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes fluid-applied, vapor-permeable membrane weather barriers.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for wall sheathings and wall sheathing joint-and-penetration treatments.

1.3 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.
- B. Shop Drawings: For air-barrier assemblies.
 - 1. Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - 2. Include details of interfaces with other materials that form part of air barrier.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.

- C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.
 - 1. Protect substrates from environmental conditions that affect air-barrier performance.
 - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor- permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.004 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 283 ASTM E 783 or ASTM E 2357.

2.3 VAPOR-PERMEABLE MEMBRANE AIR-BARRIER

- A. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: synthetic polymer membrane.
 - 1. Synthetic Polymer Membrane:
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Carlisle Coatings & Waterproofing Inc.
 - 2) Grace Construction Products; W.R. Grace & Co. -- Conn.
 - 3) Henry Company, Sealants Division.

- 4) Sto Corp.
- 5) Tremco Incorporated.
- 6) Prosoco

2. Physical and Performance Properties:
 - a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
 - b. Vapor Permeance: Minimum 10 perms; ASTM E 96/E 96M.
 - c. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
 - d. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.4 ACCESSORY MATERIALS

- A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier material.
- B. Primer: Liquid primer recommended for substrate by air-barrier material manufacturer.
- C. Counterflashing Strip: Modified bituminous, 40-mil- thick, self-adhering sheet consisting of 32 mils of rubberized asphalt laminated to an 8-mil- thick, cross-laminated polyethylene film with release liner backing.
- D. Modified Bituminous Strip: Vapor retarding, 40 mils thick, smooth surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil- thick polyethylene film with release liner backing.
- E. Joint Reinforcing Strip: Air-barrier manufacturer's glass-fiber-mesh tape.
- F. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- G. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- H. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0187 inch thick, and Series 300 stainless-steel fasteners.
- I. Modified Bituminous Transition Strip: Vapor retarding, 40 mils thick, smooth surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil- thick polyethylene film with release liner backing.
- J. Adhesive-Coated Transition Strip: Vapor-permeable, 17-mil- thick, self-adhering strip consisting of an adhesive coating over a permeable laminate with a permeance value of 37 perms.
- K. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 07 90 00 "Joint Protection."
- L. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 - 2. Verify that concrete has cured and aged for minimum time period recommended by air-barrier manufacturer.
 - 3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 4. Verify that masonry joints are flush and completely filled with mortar.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 JOINT TREATMENT

- A. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 1193 and air-barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.
 - 1. Prime substrate and apply a single thickness of air-barrier manufacturer's recommended preparation coat extending a minimum of 3 inches along each side of joints and cracks. Apply a double thickness of fluid air-barrier material and embed a joint reinforcing strip in preparation coat.
- B. Gypsum Sheathing: Fill joints greater than 1/4 inch with sealant according to ASTM C 1193 and air-barrier manufacturer's written instructions. Apply first layer of fluid air-barrier material at joints. Tape joints with joint reinforcing strip after first layer is dry. Apply a second layer of fluid air-barrier material over joint reinforcing strip.

3.4 TRANSITION STRIP INSTALLATION

- A. General: Install strips, transition strips, and accessory materials according to air-barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.
 - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install modified bituminous strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by fluid air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 - 1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- C. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- D. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- E. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply elastomeric flashing sheet so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.
 - 1. Elastomeric Flashing Sheet: Apply adhesive to wall, frame, and flashing sheet. Install flashing sheet and termination bars, fastened at 6 inches o.c. Apply lap sealant over exposed edges and on cavity side of flashing sheet.
- G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
- H. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- I. Seal top of through-wall flashings to air barrier with an additional 6-inch- wide, counterflashing strip.
- J. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- K. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

3.5 FLUID AIR-BARRIER MEMBRANE INSTALLATION

- A. General: Apply fluid air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions. Apply fluid air-barrier material within manufacturer's recommended application temperature ranges.
 - 1. Apply primer to substrates at required rate and allow it to dry.
 - 2. Limit priming to areas that will be covered by fluid air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 - 3. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- B. Apply strip and transition strip a minimum of 1 inch onto cured air-barrier material according to air-barrier manufacturer's written instructions.
- C. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Continuous structural support of air-barrier system has been provided.
 - 3. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 - 4. Site conditions for application temperature and dryness of substrates have been maintained.
 - 5. Maximum exposure time of materials to UV deterioration has not been exceeded.
 - 6. Surfaces have been primed, if applicable.
 - 7. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
 - 8. Termination mastic has been applied on cut edges.
 - 9. Strips and transition strips have been firmly adhered to substrate.
 - 10. Compatible materials have been used.
 - 11. Transitions at changes in direction and structural support at gaps have been provided.
 - 12. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
 - 13. All penetrations have been sealed.
- C. Tests: As determined by Owner's testing agency from among the following tests:
 - 1. Qualitative Air-Leakage Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E 1186, smoke pencil with pressurization or depressurization.
 - 2. Quantitative Air-Leakage Testing: Air-barrier assemblies will be tested for air leakage according to ASTM E 783.

3. Adhesion Testing: Air-barrier assemblies will be tested for minimum air-barrier adhesion of 30 lbf/sq. in. according to ASTM D 4541 for each 600 sq. ft. of installed air barrier or part thereof.
- D. Air barriers will be considered defective if they do not pass tests and inspections.
 1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
 2. Remove and replace deficient air-barrier components for retesting as specified above.
- E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

3.7 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.
 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION

SECTION 07 42 13

METAL WALL PANELS/SIDING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Preformed metal siding system for walls
 - 2. Related flashings and trim
 - 3. Accessories
- B. Related Sections:
 - 1. Section 05 12 00 - Structural Steel Framing: Structural steel building frame
 - 2. Section 07 21 16 - Blanket Insulation
 - 3. Section 07 27 26 - Fluid-Applied Membrane Air Barriers
 - 4. Section 07 62 00 - Sheet Metal Flashing and Trim including metal coping
 - 5. Section 07 90 00 - Joint Protection: Sealant at perimeter, openings, and dissimilar materials
 - 6. Section 08 12 14 - Standard Steel Frames: Exterior Doors
 - 7. Section 08 36 13 - Sectional Doors: Door Trim
 - 8. Section 08 41 13 - Aluminum Framed Entrances and Storefronts: Entry Doors

1.2 REFERENCES

- A. American Society of Civil Engineers:
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures
- B. ASTM International:
 - 1. ASTM A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Pre-painted by the Coil-Coating Process for Exterior Exposed Building Products
 - 2. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
 - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
 - 4. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials

1.3 SYSTEM DESCRIPTION

- A. System: Preformed and prefinished metal siding system of vertical and horizontal profile; site assembled; with sub-furring framing assembly

1.4 PERFORMANCE REQUIREMENTS

- A. Components: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with applicable code
 - 1. Design Pressure: Minimum 20 lb/sq ft
- B. Maximum Allowable Deflection of Panel: 1/180 of span
- C. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; deflection of structural support framing

- D. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system
- E. Products: Provide continuity of thermal barrier at building enclosure elements in conjunction with thermal insulating materials

1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit data on panels
- C. Samples: Submit two samples of wall panels, 2x2 inch in size illustrating finish color, sheen, and texture

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements
- B. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap
- C. Store prefinished material off ground protected from weather, to prevent twisting, bending, or abrasion, and to provide ventilation
 - 1. Slope metal sheets to ensure drainage
- D. Prevent contact with materials capable of causing discoloration or staining

1.8 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions
- B. Coordinate Work for installation of vapor retarder and air barrier seals
- C. Coordinate Work with installation of windows, doors, louvers, and adjacent components or materials

1.9 WARRANTY

- A. Section 01 73 00 - Execution and Section 01 77 00 - Closeout Procedures: Product warranties and product bonds
- B. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within one year from date of Substantial Completion
- C. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within 25 years from date of Substantial Completion, including:
 - 1. Fluoropolymer Two- Coat System:
 - a. Color fading in excess of 5 Hunter units per ASTM D 2244
 - b. Chalking in excess of No. 8 rating per ASTM D 4214
 - c. Failure of adhesion, peeling, checking, or cracking
 - 2. Modified Silicone-Polyester Two-Coat System:
 - a. Color fading in excess of 5 Hunter units per ASTM D 2244, for vertical

- applications
- b. Color fading in excess of 7 Hunter units per ASTM D 2244, for non-vertical applications
- c. Chalking in excess of No. 8 rating per ASTM D 4214, for vertical applications
- d. Chalking in excess of No. 6 rating per ASTM D 4214, for non-vertical applications
- e. Failure of adhesion, peeling, checking, or cracking

PART 2 - PRODUCTS

2.1 METAL WALL PANELS

- A. Manufacturers:
 - 1. Metal Sales
 - 2. ATAS International, Inc.
 - 3. Berridge Manufacturing Company
 - 4. Bridger Steel
 - 5. MBCI
 - 6. Nucor Building Systems
 - 7. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPONENTS

- A. Exterior Pre-coated Panel and Other Sheet Materials:
 - Pre-coated Steel Panel and Other Sheet Materials: Minimum 24 gauge thick pre-coated steel stock.
 - a. Pre-coated Aluminum-Zinc Alloy Coated Steel: ASTM A755/A755M; AZ 50 aluminum-zinc alloy coating; shop pre-coated with manufacturer's standard thermosetting coating
 - b. Exposed Exterior Surfaces: Color as selected from manufacturer's standard range
- B. Exterior Vertical Metal Wall Panel/Siding (MP-2):
 - 1. Manufacturer:
 - a. Metal Sales: TLC-3
 - b. MBCI: FW-120-1
 - c. Metal Span: FW 120
 - d. Substitutions: Section 01 60 00 Product Requirements
 - 2. Profile: FW-120-1 with one bead
 - 3. Gauge: 24
 - 4. Color: Selected from manufacturer's standard colors:
 - 5. Width: 12 inches
- C. Miscellaneous Sheet Materials:
 - 1. Pre-coated Galvanized Steel: Minimum 24 gage thick steel stock.
 - a. Aluminum-Zinc Alloy Coated Steel: ASTM A792/A792M Commercial - CQ Quality, Coating Designation AZ 50 aluminum-zinc alloy coating
 - b. Pre-coated Surfaces: Color as selected from manufacturer's standard range
- D. Insulation:
 - 1. Type specified in Section 07 21 16
- E. Sub-girts: manufacturer's standard profile as indicated on Drawings; to attach panel system to structural frame
- F. Thickness as required to support specified loads within specified deflection limitations
- G. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; brake formed to required angles

- H. Expansion Joints:
 - 1. Same material, thickness and finish as exterior sheets; manufacturer's standard brake formed type, of profile to suit system
 - 2. Exposed fasteners same finish as panel system
- I. Trim, Closure Pieces, Caps, Flashings: Same material, thickness and finish as exterior sheets; brake formed to required profiles
- J. Anchors: Type recommend by panel manufacturer

2.3 ACCESSORIES

- A. Sealants:
 - 1. Manufacturer's standard type suitable for use with installation of system
 - 2. Color as selected to match siding
- B. Fasteners:
 - 1. Manufacturer's standard type to suit application; with soft neoprene washers; fastener cap same color as exterior panel
 - 2. Exposed fasteners same finish as panel system
- C. Power Actuated Fasteners: Steel, hot dip galvanized; with soft neoprene washers, fastener cap same color as exterior panel
- D. Field Touch-up Paint: As recommended by panel manufacturer
- E. Bituminous Paint: Asphalt base

2.4 FABRICATION

- A. Form sections to shape indicated on Drawings, accurate in size, square, and free from distortion or defects
- B. Form pieces in longest practicable lengths
- C. Panel Profile: Manufacturer's standard profile for specified system
- D. Fabricate corners in one continuous piece with minimum 18 inch returns

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions
- B. Verify building framing members are ready to receive panel system

3.2 INSTALLATION

- A. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint
 - 1. Allow to dry prior to installation
- B. Fasten siding to structural supports; aligned, level, and plumb
- C. Locate joints over supports. Lap panel ends minimum 2 inches.
- D. Install expansion or control joints where indicated
- E. Use manufacturer recommend fasteners unless otherwise approved by Architect
- F. Seal to prevent weather penetration
 - 1. Maintain neat appearance

3.3 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances
- B. Maximum Offset From Indicated Alignment Between Adjacent Members Butting or In Line: 1/16 inch
- C. Maximum Variation from Plane or Location Indicated on Drawings: 1/8 inch

3.4 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning
- B. Remove site cuttings from finish surfaces
- C. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water

END OF SECTION

SECTION 07 53 03

ELASTOMERIC MEMBRANE ROOFING (TPO) - FULLY ADHERED

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes membrane roofing, base flashings roofing membrane expansion joints, and counterflashings
- B. Related Sections:
 - 1. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood nailers
 - 2. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
 - 2. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
 - 3. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
 - 4. ASTM D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
 - 5. ASTM D4637 - ASTM D5019 - Standard Specification for Reinforced Non-Vulcanized Polymeric Sheet Used in Roofing Membrane
 - 6. ASTM D6878 - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing
 - 7. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
 - 8. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials
 - 9. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings
 - 10. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials
- B. FM Global:
 - 1. FM DS 1-28 - Wind Loads to Roof Systems and Roof Deck Securement
- C. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings
- D. National Roofing Contractors Association:
 - 1. NRCA - The NRCA Roofing and Waterproofing Manual
- E. Single Ply Roofing Institute:
 - 1. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems
- F. Underwriters Laboratories Inc.:
 - 1. UL - Fire Resistance Directory
 - 2. UL 790 - Tests for Fire Resistance of Roof Covering Materials
 - 3. UL 1256 - Fire Test of Roof Deck Construction
 - 4. UL 1897 - Uplift Tests for Roof Covering Systems

1.3 SYSTEM DESCRIPTION

- A. Elastomeric Sheet Membrane Conventional Roofing System: One ply membrane system with insulation, and adhesive applied membrane finish.

1.4 DESIGN REQUIREMENTS

- A. Low Slope Membrane Roof Edge Securement: Conform to SPRI ES-1 for wind speeds determined from applicable code.

1.5 PERFORMANCE REQUIREMENTS

- A. Uplift Resistance: UL 1897; 90 psf uplift pressure resistance.

1.6 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Shop Drawings: Joint and termination detail conditions, conditions of interface with other materials
 - 1. Indicate membrane layout and seam locations
- C. Product Data: Submit characteristics on membrane materials, adhesives, seaming materials, and flashing materials
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in fully adhered, unreinforced TPO membranes with ten years' experience
 - 1. The manufacturer shall certify the TPO membrane meets the physical properties specified
- B. Applicator: A company approved by Manufacturer, and specializing in single-ply roofing systems with at least three installations of fully adhered TPO roofing within the past two years

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products
- B. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact
- C. Store products in weather protected environment, clear of ground and moisture

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site
- B. Do not apply roofing membrane during inclement weather without proper weather protection
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day

1.11 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions
- B. Coordinate Work with installation of associated roof penetrations and metal flashings, as Work of this section proceeds

1.12 WARRANTY

- A. Section 01 73 00 - Execution and Section 01 77 00 - Closeout Procedures: Requirements for warranties
- B. Furnish 30-year State of Idaho manufacturer's warranty including coverage of materials and installation and resulting damage to building resulting from failure to resist penetration of moisture
- C. Furnish 5 year State of Idaho Standard Roofing Contractor warranty including coverage of installation and resulting damage to building resulting from failure to resist penetration of moisture

PART 2 - PRODUCTS

2.1 SINGLE PLY ROOFING - FULLY ADHERED

- A. Manufacturers:
 - 1. Carlisle SynTec Systems Model: Sure Weld
 - 2. Firestone Building Products Co. Model Ultra-Ply
 - 3. GAF , Model (Everguard)
 - 4. Johns Manville
 - 5. Versico
 - 6. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPONENTS

- A. Elastomeric Sheet Material:
 - 1. Membrane shall be 80 mil overall minimum thickness, uncured white TPO membrane reinforced
 - 2. In order to minimize seams on the roof, the minimum width of the membrane shall be 6 feet

- B. The membrane shall have the following physical properties.

	<u>Physical Property</u>	<u>Test Method</u>	<u>Typical Values</u>
1.	Tolerance on nominal thickness, %	ASTM D-751	+10%
2.	Thickness over scrim, in	ASTM D-68780	.024
3.	Breaking Strength	ASTM D-751	250 min
4.	Elongation break of reinforcement, %	ASTM D-751	15 min.
5.	Tear Strength	ASTM D-751	55 min.
6.	Brittleness	ASTM D-2137	-40 max
7.	Linear dimensional change, %	ASTM D-1204	± 1 max
8.	Ozone Resistance**	ASTM D-1149	Pass
9.	Water absorption resistance, mass %	ASTM D-471	3.0 max
10.	Factory seam strength, lbf /in	ASTM D-751	66 min
11.	Field seam strength, lbf /in	ASTM D1876	25 min
12.	Water Vapor Permeance, Perms	ASTM E96	0.10 max
13.	Puncture Resistance, lbf	FTM 101C (Method 2031)	300 min
14.	Solar Reflectance (initial)	ASTM E-903	>70%
15.	Thermal Emittance	ASTM E-408	>0.93
16.	Properties after heat aging,	ASTMD573	670 hrs. @ 240 °F

17. Breaking strength, % retained	90 min
18. Elongation reinf., % retained	90 min
19. Tearing strength, % retained	60 min.
20. Weight change, %±	1.0 max

- C. Seaming Materials: As recommended by membrane manufacturer
- D. Washer Disc: Membrane material with adhesive backing
- E. Adhesive Materials:
 - 1. Surface Conditioner: type compatible with membrane
 - 2. Membrane Adhesives: As recommended by membrane manufacturer
 - 3. Insulation Adhesive: As recommended by insulation manufacturer
 - 4. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane
- F. Insulation: ASTM C1289, type II, Class I, faced rigid cellular polyisocyanurate roof insulation, with the following characteristics:
 - 1. Board Density: 2lb/cu ft
 - 2. Board Size: 48 x 96 inch
 - 3. Board Thickness: 2 inches
 - 4. Board Edges: square
 - 5. Thermal Conductivity: K factor of 25 as determined by ASTM C1289
 - 6. Compressive Strength: Minimum 20 psi
- G. Disc Washers and Screws:
 - 1. Disc washer: 2 inches in diameter, 22 gauge metal.
 - 2. Screws As recommended by membrane manufacturer to penetrate roof deck.
- H. Flexible Flashings: Same material as membrane
- I. Counterflashings: Galvanized metal, as specified in Section 07 62 00

2.3 ACCESSORIES

- A. Roofing Nails: Galvanized hot dipped or non-ferrous type, size as required to suit application.
- B. Sealants: As recommended by membrane manufacturer.
- C. Stack Boots: Flexible boot and collar for pipe stacks through membrane.
- D. Overnight Seal: As provided by Manufacturer.
 - 1. Substitutions: Not Permitted

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions
- B. Verify surfaces and site conditions are ready to receive Work
- C. Verify deck is supported and secure
- D. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains and suitable for installation of roof system
- E. Verify deck surfaces are dry and free of snow or ice
- F. Verify roof openings, curbs and vents through roof are solidly set, and reglets are in place

3.2 PREPARATION

- A. Existing roofing

1. Clean any existing roof surface as required to install new roofing
2. Remove all existing roofing material as required to provide a flat surface
3. Remove only the amount of roofing that can be replaced in the same day
4. Seal the edge of the roofing membrane watertight with manufacture overnight seal at the end of each day

B. Existing Insulation:

1. Replace or repair the damaged insulation as required to provide smooth roof surface

3.3 INSTALLATION

A. Insulation Application (Adhered):

1. Ensure vapor retarder is clean and dry
2. Apply adhesive to existing insulation. Embed insulation into adhesive with full contact
3. Apply adhesive to top surface of insulation
 - a. Embed second layer of insulation into adhesive, with joints staggered minimum 6inch from joints of first layer
4. Place constant thickness first layer and tapered thickness insulation second layer to required slope pattern
5. Minimum Total Insulation Thickness: 6 inches, including existing insulation.
6. Lay boards with edges in moderate contact without forcing
 - a. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof
7. Cut boards to slope for distance of 18 inches back from roof drains for positive drainage
8. Apply no more insulation than can be covered with membrane in same day

B. Membrane Application:

1. Apply primer
2. Apply adhesive as recommended by roofing manufacturer
3. Roll out membrane, free from air pockets, wrinkles, or tears
 - a. Firmly press sheet into place without stretching
4. Bond sheet to insulation except those areas directly over or within 3 inches of control or expansion joint
5. Overlap edges and ends and seal by heat welding minimum 3inches
 - a. Seal permanently waterproof
 - b. Apply uniform bead of sealant to joint edge
6. Seal membrane around roof penetrations

C. Flashings And Accessories:

1. Apply flexible flashings to seal membrane to vertical elements
2. Secure to nailing strips at 4 inches oc and reglets
3. Coordinate installation of roof drains and related flashings
4. Seal flashings and flanges of items penetrating membrane

3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing

3.5 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning
- B. In areas where finished surfaces are soiled by Work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions
- C. Repair or replace defaced or disfigured finishes caused by Work of this section

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution and Section 01 77 00 - Closeout Procedures: Protecting installed construction
- B. Protect building surfaces against damage from roofing Work
- C. Where traffic must continue over finished roof membrane, protect surfaces

END OF SECTION

SECTION 07 53 03

ELASTOMERIC MEMBRANE ROOFING (PVC) – (ALTERNATIVE OPTION TO TPO)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes membrane roofing, base flashings, roofing membrane expansion joints, and counterflashings
- B. Related Sections:
 - 1. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood nailers
 - 2. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
 - 2. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
 - 3. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
 - 4. ASTM D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
 - 5. ASTM D4637 - ASTM D5019 - Standard Specification for Reinforced Non-Vulcanized Polymeric Sheet Used in Roofing Membrane
 - 6. ASTM D4434 - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing
 - 7. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
 - 8. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials
 - 9. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings
 - 10. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials
- B. FM Global:
 - 1. FM DS 1-28 - Wind Loads to Roof Systems and Roof Deck Securement
- C. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings
- D. National Roofing Contractors Association:
 - 1. NRCA - The NRCA Roofing and Waterproofing Manual
- E. Single Ply Roofing Institute:
 - 1. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems
- F. Underwriters Laboratories Inc.:
 - 1. UL - Fire Resistance Directory
 - 2. UL 790 - Tests for Fire Resistance of Roof Covering Materials
 - 3. UL 1256 - Fire Test of Roof Deck Construction

4. UL 1897 - Uplift Tests for Roof Covering Systems

1.3 SYSTEM DESCRIPTION

- A. Elastomeric Sheet Membrane Conventional Roofing System: One ply membrane system with insulation, and adhesive applied membrane finish, fully adhered

1.4 DESIGN REQUIREMENTS

- A. Low Slope Membrane Roof Edge Securement: Conform to SPRI ES-1 for wind speeds determined from applicable code

1.5 PERFORMANCE REQUIREMENTS

- A. Uplift Resistance: UL 1897; 90 psf uplift pressure resistance

1.6 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Shop Drawings: Joint and termination detail conditions, conditions of interface with other materials
 - 1. Indicate membrane layout and seam locations
- C. Product Data: Submit characteristics on membrane materials, adhesives, seaming materials, and flashing materials
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements

1.7 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures and Section 01 78 23 - Operation and Maintenance Data: Requirements for submittals
 - 1. Installation and Maintenance Data: For roofing system to include the following in Roof Plan Binder:
 - a. Bid Document (Specification)
 - b. Installation History (Notice of Award / Accepted Notice of Award)
 - c. Warranties (State of Idaho 20 year and State of Idaho 3 year contractor warranties)
 - d. Maintenance forms and requirements

1.8 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in fully adhered, reinforced PVC membranes with ten years' experience
 - 1. The manufacturer shall certify the PVC membrane meets the physical properties specified
- E. Applicator: A company approved by Manufacturer, and specializing in single-ply roofing systems with at least three installations of fully adhered PVC roofing within the past two years

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products
- B. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact
- C. Store products in weather protected environment, clear of ground and moisture
 - 1. Store membrane rolls lying down on pallets and fully protected from the weather with clean canvas tarpaulins
 - a. Unvented polyethylene tarpaulins are not accepted
 - 2. Store adhesives at temperatures between 40°F and 80°F
 - a. Read instructions contained on adhesive canister for specific storage instructions
 - 3. Store all flammable materials in a cool, dry area away from sparks and open flames
 - a. Follow precautions outlined on containers or supplied by material manufacturer/supplier
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.
- E. All materials which are determined to be damaged by the Owner's or Manufacturer Representative shall be removed from the job site and replaced at no cost to the Owner

1.2 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site
- B. Do not apply roofing membrane during inclement weather without proper weather protection
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day

1.3 COORDINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions
- B. Coordinate Work with installation of associated roof penetrations and metal flashings, as Work of this section proceeds

1.4 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Requirements for warranties
- B. Furnish 30-year State of Idaho manufacturer's warranty including coverage of materials and installation and resulting damage to building resulting from failure to resist penetration of moisture.

- C. Furnish 5-year State of Idaho Standard Roofing Contractor warranty including coverage of installation and resulting damage to building resulting from failure to resist penetration of moisture.

PART 2 - PRODUCTS

2.1 SINGLE PLY ROOFING - FULLY ADHERED

- A. Manufacturers:
1. Fibertite
 2. Sika Sarnafil
 3. Carlisle Syntec
 4. GAF
 5. John Mansville
 6. Versico
 7. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPONENTS

- A. Elastomeric Sheet Material: Membrane shall be 80 mil overall minimum thickness, uncured white PVC membrane reinforced.
1. In order to minimize seams on the roof, the minimum width of the membrane shall be 6 feet.

- B. The membrane shall have the following physical properties.

<u>Parameters</u>	<u>ASTM Test Method</u>	<u>ASTM D-4434 Spec. Requirement</u>	<u>Typical Physical Properties</u>
Reinforcing Material	-	-	Fiberglass
Overall Thickness(1), min., inches (mm)	D638	0.045 (1.14)	[0.0__inches]]
Thickness Above Scrim, mil	-	16	24 (avg.)
Tensile Strength, min., lbf/in (N) (machine transverse)	D751	55 (245) - 55 (245)	55 (245) - 55 (245)
Elongation at Break, min. (machine / transverse)	D751	250% / 220%	250% / 220%
Seam strength(2), min. (% of tensile strength)	D638	75	80
Retention of Properties After Heat Aging	D3045	-	-
Tensile Strength, min., (% of original)	D638	90	95
Elongation, min., (% of original)	D638	90	90
Tearing Resistance, min., lbf (N)	D1004	10 (45.0)	14 (63.0)
Low Temperature Bend, -40° F (-40° C)	D2136	Pass	Pass
Accelerated Weathering Test (florescent light, uv exposure)	G154	5,000 Hours	10,000 Hours
Cracking (7x magnification)	-	None	None
Discoloration (by observation)	-	Negligible	Negligible
Crazing (7x magnification)	-	None	None
Linear Dimensional Change	D1204	0.10 % max.	0.02%
Weight Change After Immersion in Water	D570	± 3.0% max.	2.5%
Static Puncture Resistance, 33 lbf (15 kg)	D5602	Pass	Pass
Dynamic Puncture Resistance, 7.3 ft-lbf (10 J)	D5635	Pass	Pass
Initial Solar Reflectance	E903	-	0.83
Emissivity	E408, C1371, Other	-	0.90
Solar Reflective Index (SRI)	E1980	-	104
Recycled Content (5 & 10 ft. sheets only)	9% Pre-Consumer / 1% Post Consumer		

Notes

- (1) Typical Physical Properties data is applicable for 0.048 in (1.2 mm) membrane thickness and greater.
(2) Failure occurs through membrane rupture not seam failure.

- D. Seaming Materials: As recommended by membrane manufacturer.

- E. Adhesive Materials:
 1. Surface Conditioner: type compatible with and required by manufacturer
 2. Membrane Adhesives: As recommended by insulation manufacturer
 3. Insulation Adhesive: As recommended by insulation manufacturer
 4. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

- F. Insulation: ASTM C1289, type II, Class I, faced rigid cellular polyisocyanurate roof insulation, with the following characteristics:
 1. Board Density: 2lb/cu ft
 2. Board Size: 48 x 96 inch
 3. Board Thickness: 2 inches
 4. Board Edges: square
 5. Thermal Conductivity: K factor of 25 as determined by ASTM C1289
 6. Compressive Strength: Minimum 20 psi

- G. Disc Washers and Screws:
 1. Disc washer: 2 inches in diameter, 22 gauge metal.
 2. Screws As recommended by membrane manufacturer to penetrate roof deck.

- H. Flexible Flashings:
 1. Flashing Membrane – 80 mils min, white (to match field of roof). Fiberglass reinforced.
 2. Detail Membrane – 80 mils min, white (to match field of roof). Non reinforced.
 3. PVC clad metal – for use at the eaves and other conditions. See detail drawings.
 4. Flashing Adhesive: Solvent-based reactivating adhesive used to attach membrane to flashing substrate.
 5. Self-adhered flashing material is also acceptable as long as included in roofing manufacturer's warranty for the full term (30 years) of the warranty.

- I. Counter flashings: Galvanized metal, as specified in Section 07 62 00

- J. Walkway Protection: Polyester reinforced, 96 mil (2.4 mm) thick, weldable membrane with surface embossment similar to a chevron pattern. Used as a protection layer from rooftop traffic.

2.3 ACCESSORIES

- A. Roofing Nails: Galvanized hot dipped or non-ferrous type, size as required to suit application

- B. Sealants: As recommended by membrane manufacturer

- C. Stack Boots: Flexible boot and collar for pipe stacks through membrane

- D. Aluminum Tape: 2" (51 mm) wide pressure-sensitive aluminum tape used as a separation layer between small areas of asphalt contamination and the membrane and as a bond-breaker under the coverstrip at PVC clad joints.

- E. Seam Cleaner: Used to clean adhesive out of seams. It is not to be used as a general membrane cleaner. It is also used to clean metal and reactivate existing Liquid Flashing prior to the application of new Liquid Flashing.

- F. Peel Stop: 1" wide extruded aluminum, low profile bar used with #15 fasteners to secure membrane to the roof deck or to walls/curbs at terminations, penetrations and at angle changes of the substrate.
- G. Pitch Pocket Filler: Moisture-cured, one-component polyurethane-based, non-sag elastomeric sealant used in wall, curb and drain terminations. It is also used as a sealant at pipe penetrations and under certain metal flashings. Sikaflex-1a can be used as a pourable sealer pocket filler.
- H. Overnight Seal: As provided by Manufacturer
- I. Wood Nailers: Code compliant wood nailers shall be installed at the perimeter of the entire roof and around such other roof projections and penetrations as specified on Project Drawings. Thickness of nailers must match the height of the insulation and roof board to achieve a smooth transition.
- J. Fasteners: All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel. Mixed metal type components shall be assembled in such a manner as to avoid galvanic corrosion. Fasteners for attachment of metal to masonry shall be expansion type fasteners with stainless steel pins.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions
- B. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation
 - 3. The substrate shall be clean, smooth, dry, free of water, ice and snow and free of flaws, sharp edges, loose and foreign material, oil, grease and other contaminants. Roofing shall not start until all defects have been corrected.
- C. Proceed with installation only after unsatisfactory conditions have been corrected

3.2 PREPARATION

- A. Existing roofing
 - 1. Clean any existing roof surface as required to install new roofing
 - 2. Remove all existing roofing material as required to provide a flat surface.
 - a. Remove only the amount of roofing that can be replaced in the same day
 - b. Seal the edge of the roofing membrane watertight with manufacture overnight seal at the end of each day
 - 3. The roof deck and existing roof construction must be structurally sound to provide support for the new roof system. The Owner's Representative shall ensure that the roof deck is secured to the structural framing according to local building code or insurance requirements and in such a manner as to resist all anticipated loads in that location.
 - 4. Reroofing
 - a. All existing roofing, base flashing, deteriorated wood blocking or deteriorated

metal flashings shall be removed. Remove only that amount of roofing and flashing which can be made weathertight with new materials during a one-day period or before the onset of inclement weather.

- b. Steel Deck: All rusted or deteriorated decking shall be brought to the attention of the Owner's Representative to determine method of treatment or replacement. Surface-only rusted metal shall be sanded and treated with rust-inhibiting paint. Sections that have rusted deeper than the surface or are not structurally sound shall be removed and replaced. Deck type shall match existing and the attachment shall conform to local code requirements.

B. Wood Nailers:

1. Install continuous code compliant wood nailers at the perimeter of the entire roof and around roof projections and penetrations as shown on the Detail Drawings.
2. Install continuous code compliant wood nailers at the perimeter of the entire roof and around roof projections and penetrations as shown on the Detail Drawings.

3.3 INSTALLATION

A. Liquid Adhesive:

1. Apply adhesive direct to substrate, rate may vary depending on porosity of substrate. Only an area which can be completely covered in the same day's operations shall be coated with adhesive. The first layer of adhesive shall be allowed to dry completely prior to installing the membrane.
2. Refer to individual Product Data Sheets (PDS) and Adhered Systems: Solvent Based Adhesive Installation section of Roofing Applicator's Handbook for detailed installation instructions.

B. Hot-Air Welding of Membrane Overlaps

1. All membrane overlaps shall be hot-air welded. The membrane shall be clean and dry prior to hot-air welding.
2. Field membrane overlaps for automatic machine-welding shall be 3" (76 mm) in width. A minimum of 4" (10.2 cm) wide overlap is required when hand-welding details.
3. 1" (25 mm) wide cross-section samples of welded seams shall be taken at least two times a day, once in the morning and once in the afternoon.

C. Membrane Flashing:

1. All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense. Flashing shall be adhered to compatible, dry, and smooth surfaces free of dirt, dust, and debris. Use caution to ensure adhesive fumes are not drawn into the building.
2. All flashings should extend a minimum of 8" (20.3 cm) above finished roofing level. Submit requests for exceptions in writing to the Owner's Representative for signed approval.
3. All adhered flashings that exceed 45" (1.14 m) in height shall receive additional securement, unless applying SA membrane to plywood, DensDeck Prime, glass-faced polyisocyanurate, or smooth poured concrete with a concrete surface profile range of CSP 2 to CSP 5 according to ICRI Technical Guideline No. 310.2R-2013.

D. PVC Clad Metal Flashings and Edge Metal Flashings

1. All flashings shall be installed concurrently with the roof membrane as the job

progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.

2. Metal details, fabrication practices and installation methods shall conform to the applicable requirements of the following:
 - a. ANSI SPRI ES-1 (latest issue).
 - b. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - latest issue.
3. Pre-formed metal flashing shall be installed according to metal manufacturer's guidelines.
4. PVC clad and other metal flashings shall be formed and installed per the Detail Drawings.

E. Flashings And Accessories:

1. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions
2. Apply bonding adhesive as directed by Roofing Manufacturer
 - a. Do not apply to seam area of flashing
3. Flash penetrations and field-formed inside and outside corners as directed by Roofing Manufacturer
4. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive
5. Hot-air weld side and end laps to ensure a watertight seam installation
6. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars

F. Walkway

1. Flexible Walkways: Install per roofing manufacturer requirements.

G. Temporary Cut-Off

1. All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. All temporary cut-offs shall be constructed to provide a watertight seal. The new membrane shall be carried into the temporary cut-off. Temporary cut-off shall be sealed to the deck or substrate so that water will not be allowed to travel under the new or existing roofing. When work resumes, the contaminated membrane shall be cut out.
2. If inclement weather occurs while a temporary cut-off is in place, the Applicator shall provide the labor necessary to monitor the situation to maintain a watertight condition.
3. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense.

3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Adhesion tests must be done by the manufacturer of board adhesive to quantify the bond to the existing layer of polyiso. Results of adhesive test to be submitted to and reviewed by architect/owner prior to commencement of construction.

3.5 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning
- B. In areas where finished surfaces are soiled by Work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions
- C. Repair or replace defaced or disfigured finishes caused by Work of this section

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protecting installed construction
- B. Protect building surfaces against damage from roofing Work
- C. Where traffic must continue over finished roof membrane, protect surfaces

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Flashings and counterflashings
 - 2. Fascia and soffit
 - 3. Fabricated sheet metal items
 - 4. Reglets and accessories
- B. Related Sections:
 - 1. Section 07 53 03 - Elastomeric Membrane Roofing
 - 2. Section 07 90 00 - Joint Protection
 - 3. Section 09 90 00 - Painting and Coating: Field painting

1.2 REFERENCES

- A. American Architectural Manufacturers Association:
 - 1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum
 - 2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels
 - 3. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
 - 4. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels
- B. ASTM International:
 - 1. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
 - 2. ASTM A625/A625M - Standard Specification for Tin Mill Products, Black Plate, Single Reduced
 - 3. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 4. ASTM A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Pre-painted by the Coil-Coating Process for Exterior Exposed Building Products
 - 5. ASTM B32 - Standard Specification for Solder Metal
 - 6. ASTM B101 - Standard Specification for Lead-Coated Copper Sheet and Strip for Building Construction
 - 7. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 - 8. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction
 - 9. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products
 - 10. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
 - 11. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications

- 12. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free
- C. Copper Development Association Inc.:
 - 1. CDA - Copper in Architecture - Handbook
- D. Federal Specification Unit:
 - 1. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant
- E. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - Architectural Sheet Metal Manual

1.3 DESIGN REQUIREMENTS

- A. Sheet Metal Flashings: Conform to the following criteria of SMACNA "Architectural Sheet Metal Manual"

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details
- C. Product Data: Submit data on manufactured components metal types, finishes, and characteristics
- D. Samples:
 - 1. Submit two samples illustrating metal finish color

1.5 QUALIFICATIONS

- A. Fabricator and Installer: Company specializing in sheet metal work with minimum three years documented experience

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements
- B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation
 - 1. Slope metal sheets to ensure drainage
- C. Prevent contact with materials causing discoloration or staining

1.7 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination
- B. Coordinate installation of recessed flashing reglets with other section

PART 2 - PRODUCTS

2.1 SHEET METAL FLASHING AND TRIM

- A. Galvanized Steel: ASTM A653/A653M; structural steel sheet, G90 zinc coating; 0.024 inch thick steel
- B. Pre-Finished Galvanized Steel Sheet: ASTM A755/A755M; structural steel sheet, G90 zinc coating; 0.024 inch thick core steel, shop pre-coated with silicone polyester or two coat fluoropolymer top coat; color as selected from manufacturer's standard color as selected
 - 1. Compatible with the roofing membrane manufacturer warranty

2.2 ACCESSORIES

- A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers
- B. Primer: Zinc molybdate or type
- C. Protective Backing Paint: Zinc molybdate alkyd or FS TT-C-494, Bituminous
- D. Sealant: Compatible with flashing and metal trim materials
- E. Plastic Cement: ASTM D4586, Type I
- F. Reglets: Recessed type, galvanized steel or rigid extruded PVC; face and ends covered with plastic tape
- G. Solder: ASTM B32; type suitable for application and material being soldered

2.3 FABRICATION

- A. Form sections shape indicated on Drawings, accurate in size, square, and free from distortion or defects
- B. Fabricate cleats of same material as sheet metal, interlocking with sheet
- C. Form pieces in longest possible lengths
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners
- E. Form material with flat lock seams, except where otherwise indicated
 - 1. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams
- F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant
- G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip
- H. Fabricate flashings to allow toe to extend 2 inches over roofing
 - 1. Return and brake edges
- I. Seal metal joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution
- B. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located
- C. Verify roofing termination and base flashings are in place, sealed, and secure

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation
- B. Install surface mounted reglets to lines and levels indicated on Drawings
 - 1. Seal top of reglets with sealant
- C. Paint concealed metal surfaces with protective backing paint to minimum dry film thickness of 15 mil

3.3 INSTALLATION

- A. Insert flashings into reglets to form tight fit
 - 1. Secure in place with lead or plastic wedges

2. Seal flashings into reglets with sealant
- B. Secure flashings in place using concealed fasteners
 1. Use exposed fasteners only where permitted
- C. Apply plastic cement compound between metal flashings and felt flashings
- D. Fit flashings tight in place
- E. Make corners square, surfaces true and straight in planes, and lines accurate to profiles
- F. Seal metal joints watertight

3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing
- B. Inspection will involve surveillance of Work during installation to ascertain compliance with specified requirements

END OF SECTION

SECTION 07 71 00

ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes copings
- B. Related Sections:
 - 1. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal flashings

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free
- B. National Roofing Contractors Association:
 - 1. NRCA - The NRCA Roofing and Waterproofing Manual
- C. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - Architectural Sheet Metal Manual

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work
- C. Product Data: Submit data on shape of components, materials and finishes, anchor types and locations

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA or NRCA details

1.5 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Product warranties and product bonds
- B. Furnish five year manufacturer warranty for roof finish

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Copings: metal compatible with roofing materials, shaped as indicated on Drawings
 - 1. Include cover plates to conceal and weather seal joints and attachment flanges

2.2 ACCESSORIES

- A. Sealant: Manufacturer's standard type suitable for use with installation of system; non-staining, non-skinning, non-shrinking, and non-sagging; color as selected
- B. Roofing Cement: ASTM D4586, Type I or II, cutback asphalt type

2.3 FINISHES

- A. Pre-Coated Galvanized Steel: Color as selected by Architect

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions
- B. Verify deck, curbs, roof membrane, base flashing, and other items affecting Work of this section are in place and positioned correctly

3.2 INSTALLATION

- A. Conform to SMACNA - Architectural Sheet Metal Manual or NRCA - Waterproofing Manual drawing details
- B. Coordinate installation of components of this section with installation of roofing membrane and base flashings
- C. Coordinate installation of sealants and roofing cement with Work of this section to ensure water tightness
- D. Coordinate installation of flashing flanges into reglets

END OF SECTION

SECTION 07 71 23

MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes pre-finished galvanized steel or pre-finished aluminum gutters and downspouts.
 - 1. Provide precast concrete splash.
- B. Related Sections:
 - 1. Section 07 62 00 - Sheet Metal Flashing and Trim.

1.2 REFERENCES

- A. American Architectural Manufacturers Association:
 - 1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
 - 2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - 3. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - 4. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM International:
 - 1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM B32 - Standard Specification for Solder Metal.
 - 3. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- C. Federal Specification Unit:
 - 1. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.
- D. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - Architectural Sheet Metal Manual

1.3 DESIGN REQUIREMENTS

- A. Conform to SMACNA Manual for sizing components for rainfall intensity determined by storm occurrence of 1 in 5 years.
- B. Conform to applicable code for size and method of rain water discharge.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
- C. Product Data: Submit data on manufactured components, materials, and finishes.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA Manual or CDA Handbook.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope to drain.
- C. Prevent contact with materials during storage capable of causing discoloration, staining, or damage.

1.7 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Coordinate Work with downspout discharge pipe inlet.

1.8 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Product warranties and product bonds.
- B. Furnish manufacturer warranty for gutter and downspout finishes.

PART 2 PRODUCTS

2.1 GUTTERS AND DOWNSPOUTS

- A. Product Description:
 - 1. Gutters: Sheet metal; Rectangular style profile.
 - 2. Downspouts: as shown on drawings.
 - 3. Splash Pads: Precast concrete type, size and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.

2.2 COMPONENTS

- A. Pre-Finished Galvanized Steel Sheet: ASTM A653/A653M, G90 zinc coating; 24 gage core steel, shop pre-coated with modified silicone coating; color as selected from manufacturer's standard colors.
- B. Pre-Finished Aluminum Sheet: ASTM B209, manufacturer's standard alloy and temper for specified finish; 0.032 inch thick; plain stucco embossed finish shop pre-coated with modified silicone coating; color as selected from manufacturer's standard colors.

2.3 ACCESSORIES

- A. Anchors and Supports: Profiled to suit gutters and downspouts.
 - 1. Anchoring Devices: In accordance with CDA or SMACNA requirements.
 - 2. Gutter Supports: Brackets or Straps.
- B. Fasteners: Same material and finish as gutters and downspouts.
- C. Primer: Zinc molybdate or Galvanized iron type.
- D. Protective Backing Paint: Zinc molybdate alkyd.

2.4 FABRICATION

- A. Form gutters and downspouts of profiles and sizes indicated.

- B. Fabricate with required connection pieces.
- C. Form sections to shape indicated on Drawings, square, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
- D. Hem exposed edges of metal.
- E. Fabricate gutter and downspout accessories; seal watertight.

2.5 FACTORY FINISHING

- A. Modified silicone polyester coating: Baked enamel system conforming to AAMA 2603.
- B. Primer Coat: Finish concealed side of metal sheets with primer compatible with finish system, as recommended by finish system manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions.
- B. Verify surfaces are ready to receive gutters and downspouts.

3.2 PREPARATION

- A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to minimum dry film thickness of 15 mil.

3.3 INSTALLATION

- A. Sheet Metal: Join lengths with seams sealed watertight. Flash and seal gutters to downspouts and accessories.
- B. Slope gutters 1/8 inch per foot minimum.
- C. Set splash pads under downspouts. Secure in place.

END OF SECTION

SECTION 07 90 00

JOINT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Sealants
 - 2. Joint backing
 - 3. Pre-compressed foam sealers
 - 4. Accessories

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C834 - Standard Specification for Latex Sealants
 - 2. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications
 - 3. ASTM C920 - Standard Specification for Elastomeric Joint Sealants
 - 4. ASTM C1193 - Standard Guide for Use of Joint Sealants
 - 5. ASTM D1056 - Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber
 - 6. ASTM D1667 - Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam)
 - 7. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Products Data: Submit data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience
- B. Applicator: Company specializing in performing Work of this section with minimum three years documented experience

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Maintain temperature and humidity recommended by sealant manufacturer during and after installation

1.6 COORDINATION

- A. Section 01 73 00 - Execution
- B. Coordinate Work with other section requirements

PART 2 - PRODUCTS

2.1 JOINT SEALERS

- A. Manufacturers:
 - 1. BASF Building Systems
 - 2. DAP Products Inc
 - 3. Dow Corning Corporation
 - 4. Sika Corporation
 - 5. Tremco Incorporated
 - 6. Substitutions: Section 01 60 00 - Product Requirements

- B. Products Description:
 - 1. High Performance General Purpose Exterior (Non-traffic) Sealant: Silicone, Polyurethane, or Polysulfide; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single or multi- component
 - a. Color: Standard colors matching finished surfaces
 - b. Applications: Use for:
 - 1) Control, expansion, and soft joints in masonry
 - 2) All concrete slab on grade expansion and control joints
 - 3) Joints between concrete and other materials
 - 4) Joints between metal frames and other materials
 - 5) Other exterior non-traffic joints for which no other sealant is indicated
 - 2. General Purpose Exterior (Non-traffic) Sealant: Acrylic, solvent release curing; ASTM C920, Grade NS, Class 12-1/2, Uses M, G, and A; single or multi- component
 - a. Color: Standard colors matching finished surfaces
 - b. Applications: Use for:
 - 1) Control, expansion, and soft joints in masonry
 - 2) Joints between concrete and other materials
 - 3) Joints between metal frames and other materials
 - 4) Other exterior non-traffic joints for which no other sealant is indicated
 - 3. Exterior Foam Expansion Joint Sealer: Pre-compressed foam sealer; Polyurethane with water-repellent
 - a. Color: Face color as selected
 - b. Size: As required to provide weathertight and watertight seal when installed
 - c. Applications: Use for exterior wall expansion joints
 - 4. Exterior Compressible Gasket Expansion Joint Sealer: ASTM D2628, hollow neoprene (Polychloroprene) compression gasket
 - a. Color: Black color
 - b. Size and Shape: As indicated on Drawings
 - c. Applications: Use for exterior wall expansion joints
 - 5. Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, non-drying, non-skinning, non-curing
 - a. Applications: Use for concealed sealant bead in sheet metal work and concealed sealant bead in siding overlaps
 - 6. Weather Barrier Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O.
 - 7. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board
 - 8. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, single component, paintable
 - a. Color: Colors as selected
 - b. Applications: Use for interior wall and ceiling control joints, joints between door and window frames and wall surfaces, and other interior joints for

- which no other type of sealant is indicated
9. Shower Sealant: White silicone; ASTM C920, Uses M and A; single component, mildew resistant
 - a. Applications: Use for joints between plumbing fixtures and floor and wall surfaces, and joints between kitchen and toilet room counter tops and wall surfaces

2.2 ACCESSORIES

- A. Expansion Joint Cover
 1. CS Expansion Joint Covers (Or Similar)
 - a. Model SF 200/600 Series
 - b. Single Durometer: 70 Shore A, ASTM D2000
 - c. Color: #136 Gray
 - d. Brittle Point: -76°F
 - e. Ozone Resistance: No Cracks, ASTM D1149
 - f. UV Resistance: Very Good
- B. Primer: Non-staining type, recommended by sealant manufacturer to suit application
- C. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials
- D. Joint Backing: Round foam rod compatible with sealant; ASTM D1056, sponge or expanded rubber; oversized 30 to 50 percent larger than joint width
- E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions
- B. Verify substrate surfaces and joint openings are ready to receive work
- C. Verify joint backing and release tapes are compatible with sealant

3.2 PREPARATION

- A. Remove loose materials and foreign matter impairing adhesion of sealant
- B. Clean and prime joints
- C. Perform preparation in accordance with ASTM C1193
- D. Protect elements surrounding Work of this section from damage or disfiguration

3.3 INSTALLATION

- A. Perform installation in accordance with ASTM C1193
- B. Perform acoustical sealant application work in accordance with ASTM C919
- C. Measure joint dimensions and size joint backers to achieve the following , unless otherwise indicated:
 1. Width/depth ratio of 2: 1
 2. Neck dimension no greater than 1/2 of joint width
 3. Surface bond area on each side not less than 75 percent of joint width
- D. Install bond breaker where joint backing is not used
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags

- F. Apply sealant within recommended application temperature ranges
 - 1. Consult manufacturer when sealant cannot be applied within these temperature ranges
- G. Tool joints concave
- H. Pre-compressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface
- I. Compression Gaskets: Avoid joints except at ends, corners, and intersections; seal joints with adhesive; install with face 1/8 to 1/4 inch below adjoining surface
- J. Fill all concrete expansion and control joints with flowable self-leveling sealant

3.4 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning
- B. Clean adjacent soiled surfaces

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protection of installed construction
- B. Protect sealants until cured

END OF DIVISION



Idaho Department of Administration Division of Public Works

“Provide responsive, cost effective, and timely support services to Idaho’s policy makers, public agencies, and state employees as they serve Idaho citizens.”

BRAD LITTLE
Governor

KEITH REYNOLDS
Director

PAT DONALDSON
Administrator

5 YR ROOFING WARRANTY

WHEREAS _____

of (Address) _____

herein called the “Roofing Contractor”, has performed roofing and associated (“work”) on following project:

Owner: _____

DPW Project No. _____

Address: _____

Name and Type of Building: _____

Address: _____

Area of Work: _____ Date of Acceptance: _____

Warranty Period: **Five (5) years** Date of Expiration: _____

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work, and as are necessary to maintain said work in watertight condition. In addition to making the work watertight, the Roofing Contractor shall remove and/or repair blisters, ridges, flashings, splits and other irregularities which in the opinion of the Roofing Manufacturer’s technical representative do not conform to acceptable roofing practices and conditions. These repairs shall be made prior to expiration of the five (5) year Warranty Period and to the satisfaction of the Roofing Manufacturer’s technical representative.

This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by: a) lightning, windstorm; b) fire; c) failure of roofing system substrate including cracking, settlement, excessive deflection, deterioration, and decomposition; d) faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work; and e) activity on roofing by others including construction contractors, maintenance personnel, other persons, and animals whether authorized or unauthorized by Owner.

When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Contractor, and until cost and expense thereof has been paid by Owner or by another responsible party so designated.

2. The Roofing Contractor is responsible for damage to work covered by this Warranty, but is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

3. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Contractor, including cutting, patching and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void upon date of said alterations, but only to extent said alterations affect work covered by this Warranty. If Owner engages Roofing Contractor to perform said alterations, Warranty shall not become null and void, unless Roofing Contractor, prior to proceeding with said work, shall claim that said alterations would like damage or deteriorate work, thereby reasonably justifying a limitation or termination of this warranty.

4. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void upon date of said change, but only to extent said change affects work covered by this Warranty.

5. The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect or deterioration, and shall afford reasonable opportunity for Roofing Contractor to inspect work, and to examine evidence of such leaks, defects or deterioration.

6. This Warranty is recognized to be the only Warranty of Roofing Contractor on said work, and is in addition to the Roofing Guarantee furnished by the Roofing Manufacturer, and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Contractor of responsibility for performance of

original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this

_____ day of _____, 20_____

Cosigned by General Contractor by:

(General Contractor)

(Roofing Contractor)

(Business Address)

(Business Address)

(Signature)

(Signature)

(Title)

(Title)



Idaho Department of Administration Division of Public Works

“Provide responsive, cost effective, and timely support services to Idaho’s policy makers, public agencies, and state employees as they serve Idaho citizens.”

BRAD LITTLE
Governor

KEITH REYNOLDS
Director

PAT DONALDSON
Administrator

30 YEAR GUARANTY FOR SINGLE-PLY ROOFING

WHEREAS, _____, corporation whose address is _____, hereinafter called the Manufacturer, has manufactured and sold and caused to have applied, pursuant to the specifications and inspection, the necessary roofing materials to construct a _____ roof of approximately _____ square feet, and associated roof flashing of approximately _____ linear feet on the building described below:

OWNER: State of Idaho, Division of Public Works

DPW PROJECT NO: _____

BUILDING: _____

LOCATION: _____

DATE OF COMPLETION OF ROOFING: _____, 20____.

ROOFING CONTRACTOR: _____

ADDRESS: _____

ROOFING SPECIFICATION: _____

MANUFACTURER’S GUARANTEE NO: _____

AND WHEREAS, by careful examination of said roof by the Manufacturer’s representative, it has been determined that required quantities of roofing materials have been used and that roofing materials have been applied in conformance with contract documents;

AND WHEREAS, Manufacturer represents and wishes to guarantee, subject to the limits stated herein, that its roofing when so applied is effectively watertight for a period of **thirty (30) years** despite normal wear and tear by the elements, as well as guaranteeing it against defects in workmanship or materials; which result in leaks.

NOW THEREFORE, said Manufacturer guarantees to the said Owner that, as set forth below, during a period of **thirty (30) years** from the date of substantial completion of said single-ply roofing described above, Manufacturer will at its own expense, make or cause to be made, any repairs that may be necessary, as a result of defects in workmanship or materials supplied by the Manufacturer which results in leaks or of normal wear and tear by the elements which results in leaks, and will maintain said roof in water tight condition free from all leaks arising from such causes. For purposes of this Guaranty, damage to the roof caused by hurricanes, lightning, tornadoes, gales, hailstorms or other unusual natural phenomena shall not be deemed to be "normal wear and tear by the elements".

INCLUSIONS: This Guaranty does cover, and Manufacturer shall be liable for the following:

1. Roofing membrane, membrane flashings, metal flashings, mechanical fastening system, anchors, adhesives, seaming materials, slip sheets, fabrics, insulations, underlayments, and accessories furnished by the Manufacturer as incorporated into the roof membrane system.
2. Replacement of roof insulation and vapor barrier damages by any leakage and/or failure of the roof membrane assembly;
3. Repair of blisters, buckles, splits, breaks, cracks, and seam failures in membrane system.

EXCLUSIONS: This Guaranty does not cover, and Manufacturer shall not be liable for the following:

1. Metal work, including metal counter flashings, not a part of the roof membrane system and such damage as may result from application of these materials;
2. Any damage to the roof caused by structural defect in, or failure of, the building or defects in, or failure of, any structural roof deck, or other sheathing materials, used as the base over which the roof and roof insulation is applied;
3. Roof damage from special chemical conditions not disclosed to Manufacturer;
4. Any damage to the building or contents thereof, except replacement of damaged roof insulation and vapor barrier as noted under "INCLUSION" above;
5. Roof damage through use of materials after original installation not furnished by Manufacturer;
6. Damage to the roof due to mechanical abrasion or abuse not caused by the Manufacturer.
7. Reasonable care and maintenance will be the responsibility of the Owner.

INSPECTION AND REPAIR: During the term of this Guarantee, Manufacturer, its agents or employees, shall have free access to the roof during regular business hours. Upon written notice by Owner to Manufacturer within four days of the discovery of any leaks in the roofing system,

or need of repair of roof, the Manufacturer shall have ten (10) days to inspect the roof. Following such inspection:

1. Manufacturer, at its own expense shall make such repairs to thereof as are required by the Guaranty.
2. In case owner or his agent has notified Manufacturer in writing that repairs are required and such repairs are not covered by the Guaranty (including repairs required by owner's alteration, extension or addition to the roof) Owner, after having obtained Manufacturer's consent thereto, in writing, shall make or cause to be made, such repairs at Owner's expense in accordance with specifications and procedures as established by Manufacturer and this Guaranty shall thereupon remain in effect for the un-expired portion of its original term. If Owner fails to obtain authorization from Manufacturer or if repairs are made by one other than the Manufacturer's authorized designee, this Guaranty with respect to such area shall be automatically terminated.
3. In the event the (1) Owner notifies Manufacturer and has confirmed in writing the need of repair of roof and (2) Manufacturer is unable to promptly inspect and repair same, and (3) an emergency condition exists which requires prompt repair in order to avoid substantial damage to owner, then owner may make such temporary repairs as may be essential and any such action shall not be a breach of the provision of this Guaranty. Owner will bear emergency repair expenses.

INSPECTION SERVICE: Manufacturer agrees to re-inspect the completed roof not earlier than 12 nor later than 24 months after completion of the roofing, and if it is determined that there are leaks in the roofing, then Manufacturer shall make, or cause to be made at its own expense, such repairs as are necessary in the opinion of the Manufacturer, to assure watertight integrity of the roof within the scope of its' responsibility under the terms of this Guaranty.

IN WITNESS WHEREOF, Manufacturer has caused this instrument to be signed and sealed by its duly authorized officer this _____ day of _____, 20____.

BY: _____

TITLE: _____

CORPORATION: _____

SEAL:

Pat Donaldson, Administrator
Division of Public Works

DIVISION 08 OPENINGS

SECTION 08 12 14

STANDARD STEEL FRAMES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes fire rated non-rated steel frames.
- B. Related Sections:
 - 1. Section 08 13 14 - Standard Steel Doors.
 - 2. Section 08 14 16 - Flush Wood Doors.
 - 3. Section 08 71 00 - Door Hardware: Hardware, silencers, and weatherstripping.
 - 4. Section 08 80 00 - Glazing.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
- B. ASTM International:
 - 1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. National Fire Protection Association:
 - 1. NFPA 80 - Standard for Fire Doors, Fire Windows.
 - 2. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and other Opening Protectives.
 - 3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
- D. Underwriters Laboratories Inc.:
 - 1. UL 10B - Fire Tests of Door Assemblies.
 - 2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
 - 3. UL 1784 - Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.
- C. Product Data: Submit frame configuration and finishes.

1.4 QUALITY ASSURANCE

- A. Conform to requirements of ANSI A250.8.
- B. Fire Rated Frame Construction: Conform to NFPA 252.
- C. Installed Fire Rated Frame Assembly: Conform to NFPA 80 for fire rated class same as fire door.
 - 1. Air Leakage: Maximum 3.0 cfm/sf of door opening with 0.10 inch water gage pressure differential.

- D. Attach label from agency approved by authority having jurisdiction to identify each fire rated door frame.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Accept frames on site in manufacturer's packaging. Inspect for damage.
- C. Break seal on-site to permit ventilation.

1.7 COORDINATION

- A. Section 01 73 00 - Execution
- B. Coordinate Work with frame opening construction, door, and hardware installation.
- C. Sequence installation to accommodate required door hardware electric wire connections.

PART 2 PRODUCTS

2.1 STANDARD STEEL FRAMES

- A. Manufacturers:
 - 1. Amweld Building Products, Inc.
 - 2. Ceco Door Products Model.
 - 3. Republic Builders Products.
 - 4. Steelcraft.
 - 5. Substitutions: Section 01 60 00 - Product Requirement.
- B. Product Description: Standard shop fabricated steel frames, fire rated and non-rated types.
 - 1. Frames: To suit ANSI A250.8 Grade and Model of door specified in Section 08 13 14.
 - 2. Exterior Frames:
 - a. Level 3 for Door Models 1, nominal 16 gage/0.053 inch thick material, base metal thickness.
 - 3. Interior Frames:
 - a. Level 3 for Door Models 1, nominal 16 gage/0.053 inch thick material, base metal thickness.

2.2 ACCESSORIES

- A. Bituminous Coating: Non-asbestos fibered asphalt emulsion.
- B. Primer: ANSI A250.10 rust inhibitive type.
- C. Silencers: Resilient rubber set in steel fitted into drilled hole.
- D. Weatherstripping: Specified in Section 08 71 00.

2.3 FABRICATION

- A. Fabricate frames as welded unit for gypsum board slip on type, except for exterior.

- B. Fabricate frames with hardware reinforcement plates welded in place.
- C. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
- D. Prepare frames for silencers. Provide three single silencers for single doors on strike side. Provide two single silencers on frame head at double doors without mullions.
- E. Attach fire rated label to each fire rated frame.

2.4 SHOP FINISHING

- A. Steel Sheet: Galvanized to ASTM A653/A653M A60.
- B. Primer: Baked.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00: Execution
- B. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

- A. Install frames in accordance with ANSI A250.8.
- B. Coordinate with gypsum board wall construction for anchor placement.
- C. Coordinate installation of glass and glazing specified in Section 08 80 00.
- D. Coordinate installation of frames with installation of hardware specified in Section 08 71 00 and doors in Section 08 13 14.

3.3 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.4 SCHEDULE

- A. Refer to Door Schedule.

END OF SECTION

SECTION 08 13 14

STANDARD STEEL DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes non-rated, fire rated, and thermally insulated steel doors
- B. Related Sections:
 - 1. Section 08 12 14 - Standard Steel Frames
 - 2. Section 08 71 00 - Door Hardware
 - 3. Section 08 80 00 - Glazing: Glass for doors
 - 4. Section 09 90 00 - Painting and Coating: Field painting of doors

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames
- B. ASTM International:
 - 1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 2. ASTM C1363 - Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus
 - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
- C. Hollow Metal Manufacturers Association:
 - 1. HMMA 810 - Hollow Metal Doors
- D. National Fire Protection Association:
 - 1. NFPA 80 - Standard for Fire Doors, Fire Windows
 - 2. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and other Opening Protectives
 - 3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies
- E. Steel Door Institute:
 - 1. SDI 108 - Recommended Selection and Usage Guide for Standard Steel Doors
- F. Underwriters Laboratories Inc.:
 - 1. UL 10B - Fire Tests of Door Assemblies
 - 2. UL 10C - Positive Pressure Fire Tests of Door Assemblies
 - 3. UL 1784 - Air Leakage Tests of Door Assemblies

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals
- B. Shop Drawings: Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing, and finishes
- C. Product Data: Submit door configurations, location of cut-outs for hardware reinforcement

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ANSI A250.8

- B. Fire Rated Door Construction: Conform to NFPA 252
- C. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings
- D. Smoke and Draft Control Doors: Tested in accordance with UL 1784 and installed in accordance with NFPA 105
 - 1. Air Leakage: Maximum 3.0 cfm/sf of door opening with 0.10 inch water gage pressure differential
- E. Attach label from agency approved by authority having jurisdiction to identify each fire rated door
 - 1. Attach smoke label to smoke and draft control doors

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products
- B. Protect doors with resilient packaging sealed with heat shrunk plastic
- C. Accept doors on site and inspect for damage
- D. Break seal on site to permit ventilation

1.7 COORDINATION

- A. Section 01 73 00 - Execution
- B. Coordinate Work with door opening construction, door frame, and door hardware installation
- C. Coordinate installation to accommodate door hardware electric wire connections

PART 2 - PRODUCTS

2.1 STANDARD STEEL DOORS

- A. Manufacturers:
 - 1. Amweld International, LLC
 - 2. Ceco Door
 - 3. Curries Company
 - 4. Republic Doors and Frames
 - 5. Steelcraft
 - 6. Substitutions: Section 01 60 00 - Product Requirements
- B. Product Description:
 - 1. Exterior Doors (Insulated): ANSI A250.8, SDI 108, 1-3/4 inch thick
 - a. Level 3 - Extra heavy Duty, Model 1, full flush design
 - 2. Interior Doors (Non-Rated): ANSI A250.8, SDI 108, 1-3/4 inch thick
 - a. Level 3 - Extra heavy Duty, Model 1, full flush design
 - 3. Interior Doors (Fire Rated): ANSI A250.8, SDI 108, 1-3/4 inch thick
 - a. Level 3 - Extra heavy Duty, Model 1, full flush design

2.2 COMPONENTS

- A. Face: Steel sheet in accordance with ANSI A250. SDI 108
- B. End Closure: Channel, 0.04 inches thick, flush
- C. Core:
 - 1. Exterior doors: polyurethane and vertical steel stiffeners
 - 2. Interior doors: steel channel grid and vertical steel stiffeners
- D. Thermal Insulated Door: Total insulation R-Value of 14, measured in accordance with ASTM C1363

2.3 ACCESSORIES

- A. Removable Stops: Rolled steel, channel shape, mitered corners; prepared for countersink style tamper proof screws
- B. Astragals for Double Doors: Steel, T shaped, specifically for double doors
- C. Primer: ANSI A250.10 rust inhibitive type

2.4 FABRICATION

- A. Fabricate doors with hardware reinforcement welded in place
- B. Attach astragal to one leaf of pairs of fire rated doors

2.5 SHOP FINISHING

- A. Steel Sheet: Galvanized to ASTM A653/A653M A60
- B. Primer: Baked

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Verification of existing conditions before starting work
- B. Verify opening sizes and tolerances are acceptable

3.2 INSTALLATION

- A. Install doors in accordance with ANSI A250.8
- B. Install door louvers, plumb and level
- C. Coordinate installation of glass and glazing specified in Section 08 80 00
- D. Coordinate installation of doors with installation of frames specified in Section 08 12 14 and hardware specified in Section 08 71 00
- E. Touch-up damaged shop finishes

3.3 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner

3.4 ADJUSTING

- A. Section 01 73 00 - Execution: Requirements for adjusting

B. Adjust door for smooth and balanced door movement

3.5 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings

END OF SECTION

SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes flush wood doors; flush and flush glazed configuration; non-rated.
- B. Related Sections:
 - 1. Section 08 12 14 - Standard Steel Frames.
 - 2. Section 08 71 00 - Door Hardware.
 - 3. Section 08 80 00 - Glazing.
 - 4. Section 09 90 00 - Painting and Coating: Site finishing of wood doors.

1.2 REFERENCES

- A. Architectural Woodwork Institute:
 - 1. AWI - Quality Standards Illustrated.
- B. Hardwood Plywood and Veneer Association:
 - 1. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, and special blocking for hardware, factory machining criteria, identify cutouts for glazing.
- C. Product Data: Submit information on door core materials and construction, and on veneer species, type and characteristics.
 - 1. Submit two samples of door veneer, 6 x 6 inch in size illustrating wood grain, stain color, and sheen.
- D. Manufacturer's Installation Instructions: Submit special installation instructions.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with AWI Quality Standard Section 1300, Premium Grade. Finish doors in accordance with AWI Quality Standard Section 1500.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges when stored more than one week.
 - 1. Break seal on site to permit ventilation.

1.7 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination
- B. Coordinate Work with door opening construction, door frame and door hardware installation.

1.8 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Warranties.
- B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.
- C. Furnish manufacturer's "Life of Installation" warranty for interior doors.

PART 2 PRODUCTS

2.1 FLUSH WOOD DOORS

- A. Manufacturers:
 - 1. Algoma Hardwoods Inc.
 - 2. Eggers Industries.
 - 3. Marshfield Door Systems.
 - 4. Mohawk Flush Doors, Inc.
 - 5. Oshkosh Architectural Door Co.
 - 6. Substitutions: Section 01 60 00 - Product Requirements.
- B. Product Description: Solid core flush wood doors; wood veneer facing material; fire rated and non-rated types; flush glazed design; factory finished wood doors.
 - 1. Flush Interior Doors: 1-3/4 inches thick; solid core, seven ply construction, fire rated as indicated on Drawings.

2.2 COMPONENTS

- A. Solid Core, Non-Rated: AWI Section 1300, SCL Structural Composite Lumber.
- B. Interior Veneer Facing: AWI Custom quality wood, rotary cut, with center balanced match book matched grain, for transparent finish. Pair match multiple door leaves in single opening.
 - 1. Wood: Maple.
- C. Facing Adhesive: Type II - water resistant.

2.3 ACCESSORIES

- A. Glazing Stops: Wood, of same species as door facing, mitered corners; prepared for countersink style screws.

2.4 FABRICATION

- A. Fabricate doors in accordance with AWI Quality Standards requirements.
- B. Astragals for Double Doors: Treated wood, T shaped, overlapping and recessed at face edge, specifically for double doors.
- C. Furnish lock blocks at lock edge and top of door for closer for hardware reinforcement.
- D. Vertical Exposed Edge of Stiles: Of same species as veneer facing.
- E. Fit door edge trim to edge of stiles after applying veneer facing.
- F. Bond edge banding to cores.

- G. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Furnish solid blocking for through bolted hardware.
- H. Cut and configure exterior door edge to receive recessed smoke seals devices.
- I. Provide edge clearances in accordance with AWI 1300.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution
- B. Verify opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INSTALLATION

- A. Install doors in accordance with AWI Quality Standards requirements.
- B. Trim non-rated door width by cutting equally on both jamb edges.
- C. Trim door height by cutting bottom edges to maximum of 3/4 inch.
- D. Machine cut doors for hardware installation.
- E. Coordinate installation of doors with installation of frames specified in Section 08 12 14 and hardware specified in Section 08 71 00.
- F. Install door louvers plumb and level.
- G. Coordinate installation of glass and glazing specified in Section 08 80 00.
- H. Factory finish doors.

3.3 INSTALLATION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Conform to AWI requirements for fit and clearance tolerances.
- C. Maximum Diagonal Distortion (Warp): 1/8 inch measured with straight edge or taut string, corner to corner, over imaginary 36 x 84 inches surface area.
- D. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over imaginary 36 x 84 inches surface area.
- E. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over imaginary 36 x 84 inches surface area.

3.4 ADJUSTING

- A. Section 01 73 00 - Execution: Starting and adjusting.
- B. Adjust door for smooth and balanced door movement.
- C. Adjust closer for full closure.

3.5 SCHEDULE

- A. Refer to Door Schedule on Drawings.

END OF SECTION

SECTION 08 31 13

ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes non-rated access doors and panels with frames.
 - 1. Provide for access to controls, valves, traps, dampers, cleanouts, and similar items requiring operation behind inaccessible finished surfaces.
 - 2. Provide access to concealed space behind finished surfaces, under floors and above ceilings.
 - 3. Coordinate exact locations with various trades to assure proper placement of access doors and panels.
- B. Related Sections:
 - 1. Section 03 10 00 - Concrete Forming and Accessories: Placement of access frame unit anchors in concrete.
 - 2. Section 09 21 16 - Gypsum Board Assemblies: Placement of access frame unit anchors
 - 3. Section 09 22 16 - Non Structural Metal Framing: Framing for openings and placement of access unit frames anchors.
 - 4. Section 09 90 00 - Painting and Coating: Field paint finish.

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit literature indicating sizes, types, finishes, hardware, scheduled locations, fire resistance listings, and details of adjoining Work.
- C. Manufacturer's Installation Instructions: Submit installation requirements and rough-in dimensions.

1.3 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures.
- B. Project Record Documents: Record actual locations of access units.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified with minimum three years documented experience.

1.5 COORDINATION

- A. Section 01 73 00 - Execution: Requirements for coordination.
- B. Coordinate Work with work for concealed spaces controls, valves, traps, dampers, cleanouts, and similar items being located behind finished surfaces.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND PANELS

- A. Manufacturers:
 - 1. Bilco Company.
 - 2. Dur-Red Products.
 - 3. Elmdor/Stoneman Manufacturing Company.
 - 4. Karp Associates, Inc.
 - 5. Milcor.
 - 6. Nystrom, Inc.
 - 7. Substitutions: Section 01 60 00 - Product Requirement.
- B. Flush Framed Access Doors (Type 1): Frames and nominal 1 inch wide exposed flanges of 16 gage steel and door panels of 14 gage steel.
- C. Gypsum Board Access Doors (Type 2): Frames and nominal 1 inch wide flanges of 16 gage steel and door panels of 14 gage steel. Design flanges to be concealed by gypsum board joint finishing compound specified in Section 09 21 16.

2.2 FABRICATION

- A. Fabricate units of continuous welded construction; weld, fill, and grind joints to assure flush and square unit.
- B. Wall and Ceiling Access Door and Panel Hardware:
 - 1. Hinge: Standard continuous or concealed spring pin type, 175 degree steel hinges.
 - 2. Lock: Self-latching lock. Screw driver slot for quarter turn cam lock.
- C. Size Variations: Obtain acceptance of manufacturer's standard size units which vary slightly from sizes shown or scheduled.

2.3 SHOP FINISHING

- A. Manufacturer standard factory finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions.
- B. Verify rough openings for access doors and panels are correctly sized and located.

3.2 INSTALLATION

- A. Secure frames rigidly in place, plumb and level in opening, with plane of door and panel face aligned with adjacent finished surfaces.
 - 1. Set concealed frame type units flush with adjacent finished surfaces.
- B. Position unit to provide convenient access to concealed work requiring access.

END OF SECTION

SECTION 08 36 13

SECTIONAL DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes electric overhead sectional door and operating hardware,

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - 3. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- B. Door and Access Systems Manufacturers Association International:
 - 1. DASMA 102 - Specifications for Sectional Overhead Type Doors.
- C. National Electrical Manufacturers Association:
 - 1. NEMA MG 1 - Motors and Generators.
- D. National Fire Protection Association:
 - 1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- E. Underwriters Laboratories Inc.:
 - 1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 SYSTEM DESCRIPTION

- A. Panels: Flush steel, insulated.
- B. Lift Type: Standard lift operating style with lift clearance track and hardware.
- C. Operation: Electric.
- D. Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall to design pressure of 20 lb/sq ft.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.
- C. Product Data: Submit component construction, anchorage method, and hardware.
- D. Manufacturer's Installation Instructions: Submit special procedures, and perimeter conditions requiring special attention.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures.

- B. Operation and Maintenance Data:
 - 1. Include electrical control adjustment recommendations.
 - 2. Include data for motor and transmission, shaft and gearing, lubrication frequency, periodic adjustments required, and spare part sources.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with DASMA 102, Application Type Commercial.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified.
- C. Surface Burning Characteristics:
 - 1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with NFPA 255 UL 723.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years experience approved by manufacturer.

1.8 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Warranties.
- B. Furnish five year manufacturer warranty for electric operating equipment.

PART 2 PRODUCTS

2.1 SECTIONAL OVERHEAD DOORS

- A. Manufacturers:
 - 1. Raynor Garage Door Model Tricore Standard.
 - 2. Overhead Door.
 - 3. Midland Garage Door MFG. CO.- 3" Energy Saver Doors
 - 4. Wayne Dalton
 - 5. American Garage Door Supply Inc
 - 6. Substitutions: Section 01 60 00 - Product Requirements.
- B. Product Description: Steel overhead sectional doors, electric operation, stock configuration and hardware.
 - 1. Door Nominal Thickness: 3 inches thick.

2.2 DOOR OPERATOR

- A. Provide doors designed for manual chain hoist operation and electric motor operation.
- B. Manufacturer Product Designation:
 - 1. Type: Jackshaft with automatic and manual operation
 - 2. Motor Horsepower Rating: Continuous HP as determined by manufacturer for size of door.
 - 3. Electrical Requirements: 115 Volt Single Phase.
 - 4. Duty Cycle: 30 cycles/hour.
 - 5. Control Wiring: 24 volt control with provisions for connection of safety edge to reverse and external radio control hook-up. Three button momentary contact "open-close-stop".
- C. Wire Doors to open independently.

2.3 DOOR SECTIONS

- A. Material: Steel sandwich construction, 3 inches (76.2 mm) thick, roll from commercial quality, hot-dipped galvanized steel ASTM A 924 and ASTM 653. Exterior and interior section skins to be constructed of 25 gauge steel (0.017 inch minimum thickness) embossed stucco texture, mechanically interlocked and pressure bonded to a 2-7/8 inches (73 mm) thick, expanded polystyrene core. Hinge reinforcement plates shall be of 14 gauge edge plates and 16 gauge center plates, located within section interior at every hinge location. End stiles to be 14 gauge, separated from the exterior skin by a vinyl thermal break.
- B. Mounting: Sections mounted in door opening using Lap Jamb Angel Mounting: section overlap door jambs by 1 inch (25 mm) on each side of door opening Between-Jamb Bracket Mounting: sections mounted between door jambs, seal against perimeter seal installed along vertical and top horizontal edges of jambs.
- C. Insulation: Expanded polystyrene, R-value of 16.05 and U-value of 0.0623.
- D. Seals: Interior and exterior skins to be separated by continuous dual durometer vinyl seal held in place by mechanical interlock to form thermal break and complete weatherseal along section joint. Top of door to be provided with EPDM rubber sealing strip. Bottom of door to have flexible U-shape vinyl seal retained in aluminum rail.
- E. Trussing: Floors designed to withstand specified windload. Deflection of door in horizontal position to be maximum of 1/120th of door width.
- F. Color: Exterior skin to have two coats of paint, one primer coat and one finish coat. Color as selected by architect from manufacturer full range of colors.
 - 1. Bottom panel of OH door shall be high visibility yellow on interior and exterior of door
- G. Windows: Locations to comply with door elevation drawings. 36 inches by 14 inches full view (square –edge) window encased in an extruded PVC frame where shown on drawings.
- H. Glazing: Windows to be provided with 5/8 inch (16 mm) thick insulated glazing units as follows:
 - 1. Acrylic consisting of two panes of 1/8 inch (3.2 mm) thick acrylic Plexiglass

2.6 TRACK

- A. Material: Hot-dipped galvanized steel (ASTM A-653), fully adjustable for adequate sealing of door to jamb or weatherseal.
- B. Configuration Type: High Lift
- C. Size: 3 inches.
- D. Mounting: Floor-to-Shaft Angle-Mount consisting of continuous angle extending from the floor, past header, completely up to door shaft for use with steel, wood, or masonry jambs. Continuous angle size not less than 2-5/16 inches by 5 inches x 3/32 inch on 2-inch track.
- E. Finishing: Galvanized Steel

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution
- B. Verify wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.

- C. Verify electric power is available and of correct characteristics.

3.2 PREPARATION

- A. Prepare opening to permit correct installation of door unit to perimeter air and vapor retarder seal.

3.3 INSTALLATION

- A. Anchor assembly to wall construction and building framing without distortion or stress.
- B. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- C. Fit and align door assembly including hardware.
- D. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.
- E. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 90 00.
- F. Install perimeter weatherstripping.

3.4 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation from Plumb: 1/16 inch.
- C. Maximum Variation from Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 ft straight edge.
- E. Maintain dimensional tolerances and alignment with adjacent work.

3.5 ADJUSTING

- A. Section 01 73 00 - Execution: Starting and adjusting.
- B. Adjust door assembly to smooth operation and in full contact with weatherstripping.

3.6 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Clean doors, frames and glass.
- C. Remove temporary labels and visible markings.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protecting installed construction.
- B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

END OF SECTION

SECTION 08 41 13

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes aluminum-framed storefronts including aluminum and glass doors, and frames including hardware, glass, and sliding service window. Section also includes storefront windows.
- B. Related Sections:
 - 1. Section 07 27 26 - Fluid-Applied Air Barriers: Perimeter air seal between glazing system and adjacent construction.
 - 2. Section 07 90 00 - Joint Protection: System perimeter sealant and back-up materials.
 - 3. Section 08 71 00 - Door Hardware: Mortised hardware reinforcement requirements affecting framing members.
 - 4. Section 08 80 00 - Glazing.
 - 5. Section 09 90 00 - Painting and Coating: Field painting of interior

1.2 REFERENCES

- A. Aluminum Association:
 - 1. AA ADM 1 - Aluminum Design Manual.
- B. American Architectural Manufacturers Association/Window & Door Manufacturers Association:
 - 1. AAMA/WDMA 101/I.S.2 - Specification for Windows, Doors and Unit Skylights.
 - 2. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
 - 3. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
 - 4. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.
 - 5. AAMA SFM-1 - Aluminum Store Front and Entrance Manual.
- C. ASTM International:
 - 1. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 2. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 3. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
 - 4. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 5. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 6. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
 - 7. ASTM F1642/F1642M - Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings.
 - 8. ASTM F2247 - Standard Test Method for Metal Doors Used in Blast Resistant Applications (Equivalent Static Load Method).

9. ASTM F2927 - Standard Test Method for Door Systems Subject to Airblast Loadings.
- D. National Fenestration Rating Council Incorporated:
 1. NFRC 100 - Procedures for Determining Fenestration Product U-Factors.

1.3 SYSTEM DESCRIPTION

- A. Aluminum-framed storefront system includes tubular aluminum sections with supplementary internal support framing, aluminum and glass entrances, shop fabricated, factory finished, glass and glazing, related flashings, anchorage and attachment devices.
- B. System Assembly: Site assembled. Shop unitized assembly.

1.4 PERFORMANCE REQUIREMENTS

- A. System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall, including building corners.
 1. As calculated in accordance with applicable code, as tested in accordance with ASTM E330.
- B. Deflection: Limit mullion deflection to 1/175 for spans less than 13'-6" and 1/240 plus 1/4 inch for spans over 13'-6" or flexure limit of glass of span; with full recovery of glazing materials.
- C. System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.
- D. Air Infiltration: Limit air leakage through assembly to 0.06 cfm/min/sq ft of wall area, measured at reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E283.
- E. Condensation Resistance Factor: CRF of not less than 45 when measured in accordance with AAMA 1503.
- F. Water Leakage: None, when measured in accordance with AAMA/WDMA 101/I.S.2 or ASTM E331 with test pressure difference of 20 percent of design pressure, with minimum differential of 2.86 lbf/sq ft and maximum of 12.00 lbf/sq ft.
- G. Thermal and Solar Heat Transmittance of Assembly (U Value and SHGC): Comply with ICC IECC for climate zone in which project is located.
- H. Expansion / Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over 12 hour period without causing detrimental effect to system components and anchorage.
- I. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion, contraction joint location, and details.
- C. Product Data: Submit component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

- D. Design Data: Indicate framing member structural and physical characteristics, calculations, dimensional limitations.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with AAMA SFM-1 and AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Surface Burning Characteristics:
 - 1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- C. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.7 QUALIFICATIONS

- A. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum three years documented experience.
- B. Design structural support framing components under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Handle Products of this section in accordance with AAMA MCWM-1 - Curtain Wall Manual #10.
- C. Protect finished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Do not install sealants or glazing materials when ambient temperature is less than 40 degrees F during and 48 hours after installation.

1.10 COORDINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions.
- B. Coordinate the Work with installation of air barrier, components or materials.

1.11 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Product warranties and product bonds.
- B. Furnish five year manufacturer warranty for glazed units.

PART 2 PRODUCTS

2.1 ALUMINUM-FRAMED STOREFRONTS

- A. Manufacturers:
 - 1. CR Laurence
 - 2. EFCO Corp.

3. Kawneer Co., Inc.
 4. Trulite
 5. Vistawall Architectural Products.
 6. Substitutions: Section 01 60 00 - Product Requirements.
- B. Product Description:
1. Aluminum Frame: 1- 3/4 inches x 4- 1/2 inches thermally broken applied glazing stops; drainage holes; internal weep drainage system.
 2. Sill Frame: 4 inches x 4- 1/2 inches thermally broken applied glazing stops; drainage holes; internal weep drainage system.
 3. Mullions: Profile of extruded aluminum with internal reinforcement of aluminum or shaped steel structural section.
 4. Doors: Aluminum framed glass doors; 1-3/4 inches thick, 3-1/2 inches wide top rail, 5" wide vertical stiles, ADA 10" inch wide bottom rail; square glazing stops.

2.2 COMPONENTS

- A. Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper typical, 6061 alloy, T6 temper for extruded structural members.
- B. Sheet Aluminum: ASTM B209, 5005 alloy, H15 or H34 temper.
- C. Steel Sections: ASTM A36/A36M; shaped to suit mullion sections, galvanized.
- D. Glass: Specified in Section 08 80 00.
- E. Glazing Materials: Storefront manufacturer's standard types to suit application and to achieve weather, moisture, and air infiltration requirements.
- F. Flashings: Minimum 0.032 inch thick aluminum to match mullion sections where exposed.
- G. Weather Barrier: Specified in Section 07 27 26.
- H. Sealant and Backing Materials:
 1. Sealant Used within System (Not Used for Glazing): Manufacturer's standard materials to achieve weather, moisture, and air infiltration requirements.
 2. Perimeter Sealant: Specified in Section 07 90 00.
- I. Fasteners: Stainless or Hot-dip galvanized steel, standard with storefront manufacturer.
- J. Service Window Components:
 1. Self-Latching Handle
 2. Tempered Glass As Scheduled
 3. Full bottom sliding track
 4. Keyed Lock Assembly

2.3 HARDWARE

- A. Hardware per specification 08 71 00 Door Hardware unless otherwise noted in this section.
- B. Push/Pulls:
 1. Storefront Manufacturer standard push/pulls
 2. Substitutions: Under provision of Section 01 60 00.

2.4 KEYING

- A. Door Locks: Provide blank cores to Owner for keying.
- B. Provide cylinder core and two keys.
- C. Owner shall coordinate with contractor to replace construction cores with new cores.

2.5 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.
- E. Prepare components with internal reinforcement for door hardware.
- F. Reinforce framing members for imposed loads.

2.6 SHOP FINISHING

- A. Color Anodized Aluminum Surfaces: AAMA 611, AA-M12C22A44 non-specular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class I 0.7 mils clear anodized coating.
- B. Concealed Steel Items: Galvanized to ASTM A123/A123M.
- C. Apply bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar metals.
- D. Shop Primer for Steel Components: SSPC Paint 25 red oxide.
- E. Touch-Up Primer for Galvanized Steel Surfaces: SSPC Paint 20 zinc rich.
- F. Extent of Finish:
 - 1. Apply factory coating to surfaces exposed at completed assemblies.
 - 2. Apply finish to surfaces cut during fabrication so no natural aluminum is visible in completed assemblies, including joint edges.
 - 3. Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions.
- B. Verify dimensions, tolerances, and method of attachment with other Work.
- C. Verify wall openings and adjoining air and vapor seal materials are ready to receive Work of this Section.

3.2 INSTALLATION

- A. Install wall system in accordance with AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent Work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.

- F. Install sill flashings. Turn up ends and edges; seal to adjacent Work to form water tight dam.
- G. Coordinate attachment and seal of perimeter air and vapor retarder materials.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Install integral flashings and integral joint sealers.
- J. Set thresholds in bed of mastic and secure.
- K. Install hardware using templates provided. Refer to Section 08 71 00 for installation requirements.
- L. Install glass in accordance with manufacturer's recommendations.
- M. Coordinate installation of perimeter sealants per manufacturer's recommendations

3.3 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
- C. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspection to monitor quality of installation and glazing.
- C. Test to AAMA 501.
 - 1. Architect to select one installed assembly for testing

3.5 ADJUSTING

- A. Section 01 77 00 - Closeout Procedures: Testing, adjusting and balancing.
- B. Adjust operating hardware for smooth operation.

3.6 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning.
- B. Remove protective material from pre-finished aluminum surfaces.
- C. Wash down surfaces with solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- D. Remove excess sealant by method acceptable to sealant manufacturer.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protection of installed construction.
- B. Protect finished Work from damage.

END OF SECTION

SECTION 08 44 13

GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.0 SUMMARY

- A. Section Includes: Architectural Aluminum Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall framing.
- B. Related Sections:
 - 1. 08 41 13 - Aluminum-Framed Entrances and Storefronts
 - 2. 08 71 00 - Door Hardware
 - 3. 08 80 00 - Glazing

1.1 DEFINITIONS

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

1.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Loosening or weakening of fasteners, attachments, and other components.
 - d. Failure of operating units.
- B. Delegated Design: Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Wind loads: Provide Curtain Wall system; include anchorage, capable of withstanding wind loads based on structural design parameters and 2015 IBC.
- D. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft² (0.3 l/s · m²) at a static air pressure differential of 6.24 psf (300 Pa).
- E. Water Resistance, (static): The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.
- F. Water Resistance, (cyclic): The test specimen shall be tested in accordance with ASTM E 547. There shall be no leakage at a minimum static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.
- G. Water Resistance, (severe, wind driven rain): The test specimen shall be tested in accordance with AAMA 520 and ASTM E2268. There shall be no visible water at performance level 10, pressure limits 14 psf (670 Pa) – 42 psf (2010 Pa).

- H. Uniform Load: A static air design load of 42 psf (2010 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member at design load. At structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
- I. Energy Efficiency:
Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.37 (HP glass)
- J. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 75_{frame} and 71_{glass} (HP glass).
- K. Sound Transmission Loss: When tested to ASTM E90 and ASTM E1425, the Sound Transmission Class (STC) shall not be less than: STC 34

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified preconstruction testing agency, for glazed aluminum curtain walls, indicating compliance with performance requirements.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed curtain wall systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:
 - 1. Joinery
 - 2. Glazing

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Installer who has had successful experience with installation of the same or similar systems required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating glazed aluminum curtain walls that meet or exceed performance requirements.
- C. Source Limitations: Obtain aluminum curtain wall system through one source from a single manufacturer.
- D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockups for type(s) of curtain wall elevation(s) indicated, in location(s) shown on Drawings.

F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination".

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for glazed aluminum curtain walls by field measurements before fabrication and indicate measurements on Shop Drawings.

1.6 WARRANTY

A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.

1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Kawneer Company Inc.
2. C.R. Lawrence.
3. Vitro Architectural Glass
4. Tested to AAMA 501.

B. Basis of Design Product:

1. Kawneer Company, Inc.
2. 1620/1620 SSG Curtain Wall System
3. Frame depth: 2" x 7-1/2" (50.8 x 190.5), outside glazed pressure plate or structural silicone glazed (SSG) format

C. Substitutions: Section 01 60 00 – Product Requirements.

2.2 MATERIALS

A. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.

B. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.

C. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.

D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

E. Pressure Plate: Pressure plate shall be aluminum and fastened to the mullion with stainless steel screws.

F. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

- G. Sealant: For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- H. Thermal Barrier: Thermal separator shall be extruded of a silicone compatible elastomer that provides for a minimum separation from interior to exterior metal of ¼" (6mm).
- I. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 CURTAIN WALL FRAMING

- A. Framing Members: Manufacturer's standard extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Glazing System: 4 sided captured.
 - 2. Glazing Plane: Front.
- B. Glass: 1" (25.4) insulating glass option. 1/4" (6.4) for Spandrel applications.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.
- D. Framing Sealants: Shall be suitable for glazed aluminum curtain wall as recommended by sealant manufacturer.
- E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
- F. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- G. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- H. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle curtain wall material and components to avoid damage. Protect curtain wall material against damage from elements, construction activities, and other hazards before, during and after installation.

2.4 GLAZING

- A. Glazing: Comply with Section 08 80 00 "Glazing". Following glazing options are available.
 - 1. System: Outside glazed pressure plate format with 1" (25.4) double glazed insulating glass.
- B. Glazing Gaskets: Gaskets to meet the requirements of ASTM C864.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- E. Glazing Sealants: As recommended by manufacturer for joint type.

2.5 OPERABLE UNITS

- A. Doors: Comply with Section 08 41 13 "Aluminum-Framed Entrances and Storefronts".

2.6 ACCESSORY MATERIALS

- A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762 mm) thickness per coat.

2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints.
 - 3. Physical and thermal isolation of glazing from framing members.
 - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5. Provisions for field replacement of glazing from exterior.
 - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
 - 7. Internal weeping system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
- C. Curtain Wall Framing: Fabricate components for assembly using shear block system following manufacturer's standard installation instructions.
- D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
 - 1. Kawneer Permafluor™ (70% PVDF), AAMA 2605, Fluoropolymer Coating (Custom Color).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install curtain wall systems plumb, level, and true to line, without warp or rack of frames with manufacturer's prescribed tolerances and installation instructions. Provide support and anchor in place.
 - 1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
 - 2. Glazing: Glass shall be outside glazed and held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners spaced no greater than 9" (228.6) on center.
 - 3. Water Drainage: Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.
- B. Related Products Installation Requirements:
 - 1. Sealants (Perimeter): Refer to Joint Treatment (Sealants) Section.
 - 2. Glass: Refer to Glass and Glazing Section.

- a. Reference: ANSI Z97.1, CPSC 16 CFR 1201 and GANA Glazing Manual

3.3 FIELD QUALITY CONTROL

- A. Field Tests: Architect shall select curtain wall units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
 - 1. Testing: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements.
 - a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², whichever is greater.
 - b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 psf (383 Pa).
- B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 ADJUSTING, CLEANING AND PROTECTION

- A. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.
- B. Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION

SECTION 08 45 23

TRANSLUCENT PANEL UNIT WALL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the insulated, translucent sandwich panel system and accessories as shown and specified. Work includes providing and installing:
 - 1. Flat insulated, translucent sandwich panels
 - 2. Aluminum clampite installation system
 - 3. Aluminum sill flashing

1.2 SUBMITTALS

- A. Submit manufacturer's product data. Include construction details, material descriptions, profiles, and finishes of components.
- B. Submit shop drawings. Include plans, elevations, and details.
- C. Submit manufacturer's color charts showing the full range of colors available for factory finished exposed aluminum.
 - 1. When requested, submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below.
 - a. Sandwich panels: 7" x 12" units
 - b. Factory finished aluminum: 3" long sections
- D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Provide field maintenance manual to include in project maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten consecutive years and which can show evidence of those materials being satisfactorily used on at least six projects of similar size, scope, and location. At least three of the projects shall have been in successful use for ten years or longer.
 - 2. Panel system must be listed by an ANSI accredited Evaluation Service, which requires quality control inspections and fire, structural, and water infiltration testing of sandwich panel systems by an accredited agency.
 - 3. Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components, and production sandwich panels for conformance with AC177 "Translucent Fiberglass Reinforced

Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems” as issued by the ICC-ES.

1.5 PERFORMANCE REQUIREMENTS

- A. The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.
 - 1. When requested, include span analysis data.
 - 2. Standard panel system shall have less than 0.01 cfm/ft² air leakage by ASTM E 283 at 6.24 PSF (50 mph) and no water penetration by ASTM E 331 at 15 PSF; and structural testing by ASTM E 330.
 - 3. Structural Loads. Provide system capable of handling the following loads:
 - a. Positive Wind Load (PSF): ASD
 - b. Negative Wind Load (PSF): ASD
- B. Deflection Limits:
 - 1. Walls: Limited to L/60 of clear span for each assembly component.
- C. Thermal Movements: Allow for thermal movements from ambient- and surface-temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 110 deg F (43 deg C), ambient; 150 deg F (66 deg C), material surfaces.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver panel system, components, and materials in manufacturer’s standard protective packaging.
- B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer’s storage and handling instructions.

1.7 WARRANTY

- A. Provide manufacturer's and installer's written warranties agreeing to repair or replace panel system work, which fails in material or workmanship, within one year from the date of delivery. Failure of material or workmanship shall include deterioration of finish on metal in excess of normal weathering; and defects in accessories; insulated, translucent sandwich panels; and other components of the work.
- B. Extended Panel Warranty: 5 years from date of delivery.
- C. Extended Manufacturer’s factory applied Finish Warranty: 5 years from date of delivery.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The basis for this specification is for products manufactured by Kalwall Corporation. Other manufacturers may bid this project subject to compliance with the performance requirements of this specification and submission of evidence thereof. Listing other

manufacturers' names in this specification does not constitute approval of their products or relieve them of compliance with all the performance requirements contained herein.

- B. Kalwall Corporation, Tel: (800) 258-9777 – Fax: (603) 627-7905 – Email: info@kalwall.com
- C. Kingspan Translucent, Wall System, info@kingspanlightandair.us. 1-800-759-6985

2.2 PANEL COMPONENTS

A. Face Sheets:

1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
 - a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
 - b. Face sheets shall not deform, deflect, or drip when subjected to fire or flame.
2. Interior face sheets:
 - a. Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater than 50 and smoke developed no greater than 450 when tested in accordance with UL 723.
 - b. Burn extent by ASTM D 635 shall be no greater than 1”.
3. Exterior face sheets:
 - a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3 CIE Units DELTA E by ASTM D 2244 after 5 years outdoor South Florida weathering at 5° facing south as measured on a white sample, with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.
 - b. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel an impact minimum of 70 ft. lbs. without fracture or tear when impacted by a 3-1/4” diameter, 5 lb. free-falling ball per UL 972.
 - c. Erosion Protection: Integral, embedded-glass erosion barrier.
4. Appearance:
 - a. Exterior face sheet: Smooth, 0.070” thick and Crystal in color.
 - b. Interior face sheet: Smooth, 0.045” thick an Crystal in color.
 - c. Face sheets shall not vary more than $\pm 10\%$ in thickness and be uniform in color.

B. Grid Core:

1. Thermally Broken Composite I-beam grid core shall be of alloy and temper recommended by manufacturer with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16”.
2. I-beam Thermal break: Minimum 2”, thermoset fiberglass composite. Poured and de-bridged thermal break is not acceptable.

C. Laminate Adhesive:

1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council “Acceptance Criteria for Sandwich Panel Adhesives”.

2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two exposures to six cycles each of the aging conditions prescribed by ASTM D 1037.
3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to four separate conditions:
 - a. 50% Relative Humidity at 68° F: 540 PSI
 - b. 182° F: 100 PSI
 - c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
 - d. Accelerated Aging by ASTM D 1037 at 182° F: 250 PSI

2.3 PANEL CONSTRUCTION

- A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.
 1. Thickness: 4 inches
 2. Grid Core Insulation: Fill panel cores with air
 3. Panel U-factor by NFRC certified laboratory: 4" thermally broken grid 0.15
 4. Complete insulated panel system shall have NFRC certified U-factor of NFRC U-factor .11
 5. Visible Light Transmittance (VLT):
 - a. Visible LT (NFRC 202) by NFRC certified laboratory: 17%. For Crystal/Crystal
 6. Solar heat gain coefficient .11
 7. Grid pattern as viewed: Nominal size 8" X 8" ; pattern Tuckerman
- B. Standard panels shall deflect no more than 1.9" at 30 PSF in 10'-0" span without a supporting frame by ASTM E 72.
- C. Panels shall meet the conditions of acceptance according to ASTM E2707 Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure:
 1. Absence of flame penetration through the wall assembly at any time.
 2. Absence of evidence of glowing combustion on the interior surface of the assembly at the end of the 60-min observation period.
 3. Absence of evidence of flame, glow, and smoke if the test is terminated prior to the completion of the 60-min observation period.
- D. Thermally broken, insulated panels: Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.

2.4 ALUMINUM CLAMPTITE INSTALLATION SYSTEM

- A. Aluminum clamptite installation system:
 1. Thermally Broken-Flat clamp-tite screw type closure system shall be of extruded aluminum alloy and temper as recommended by manufacturer.
- B. Sealing tape: Manufacturer's standard, pre-applied to aluminum clamptite installation system at the factory under controlled conditions.
- C. Fasteners: 300 series stainless steel screws for aluminum clamptite installation system, excluding final fasteners to the building.
- D. Finish:

1. Manufacturer's factory applied finish, which meets the performance requirements of AAMA 2604. Color to be Aluminum 79
2. Anodized

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Installer shall examine substrates, supporting structure, and installation conditions.
- B. Do not proceed with panel installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Metal Protection:
 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by sealant manufacturer for this purpose.
 2. Where aluminum will contact concrete, masonry, or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by sealant manufacturer.

3.3 INSTALLATION

- A. Install the panel system in accordance with the manufacturer's fabrication drawings and suggested installation instructions.
 1. Anchor component parts securely in place by permanent mechanical attachment system.
 2. Accommodate thermal and mechanical movements.
 3. Seal aluminum clampite installation system as shown on the manufacturer's fabrication drawings and suggested installation instructions.
- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturers fabrication drawings and suggested installation instructions.

3.4 FIELD QUALITY CONTROL

- A. Water Test: Installer to test a representative section of installed materials according to procedures in AAMA 501.2.
- B. Repair or replace work that does not pass testing or that is damaged by testing and retest work.

3.5 CLEANING

- A. Clean the panel system, interior and exterior, immediately after installation.
- B. Refer to manufacturer's written recommendations.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes hardware for wood and steel doors.
 - 1. Provide door gaskets, including weatherstripping and seals, and thresholds.
- B. Related Sections:
 - 1. Section 08 13 14 - Standard Steel Doors.
 - 2. Section 08 14 16 - Flush Wood Doors.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI A156.1 - Butts and Hinges.
 - 2. ANSI A156.2 - Bored and Preassembled Locks and Latches.
 - 3. ANSI A156.3 - Exit Devices.
 - 4. ANSI A156.4 - Door Controls - Closures.
 - 5. ANSI A156.5 - Auxiliary Locks and Associated Products.
 - 6. ANSI A156.6 - Architectural Door Trim.
 - 7. ANSI A156.7 - Template Hinge Dimensions.
 - 8. ANSI A156.12 - Interconnected Locks and Latches.
 - 9. ANSI A156.16 - Auxiliary Hardware.
 - 10. ANSI A156.18 - Materials and Finishes.
- B. Builders Hardware Manufacturers Association:
 - 1. BHMA Directory of Certified Products.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings:
 - 1. Indicate locations and mounting heights of each type of hardware, schedules, and catalog cuts.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures.
- B. Project Record Documents: Record actual locations of installed cylinders and their master key code.
- C. Operation and Maintenance Data: Submit data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- D. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following requirements:
 - 1. ANSI A156 series.
 - 2. NFPA 80.
 - 3. UL 305.
- B. Furnish hardware marked and listed in BHMA Directory of Certified Products.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Hardware Supplier: Company specializing in supplying commercial door hardware with minimum three years documented experience. Approved by primary hardware manufacturer Hardware Supplier Personnel: Employ Architectural Hardware Consultant (AHC) qualified person to assist in work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Package hardware items individually with necessary fasteners, instructions, and installation templates, when necessary; label and identify each package with door opening code to match hardware schedule.

1.8 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination
- B. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
 - 1. Provide templates or actual hardware as required to ensure proper preparation of doors and frames.

1.9 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Warranties.
- B. Furnish five year manufacturer warranty for locksets and door closers.

1.10 MAINTENANCE MATERIALS

- A. Section 01 78 23 - Operation and Maintenance Data
- B. Furnish special wrenches and tools applicable for each different and for each special hardware component.
- C. Furnish maintenance tools and accessories supplied by hardware component manufacturer.

1.11 EXTRA MATERIALS

- A. Section 01 78 23 - Operation and Maintenance Data: Spare parts and maintenance products.
- B. Furnish two extra key for each master keyed group.

PART 2 PRODUCTS

2.1 DOOR HARDWARE

- A. Hinge Manufacturers:
 - 1. Hager Companies.
 - 2. McKenney.
 - 3. Stanley Hardware.
 - 4. Substitutions: Section 01 60 00 - Product Requirements.
- B. Lockset , Latch Set , and Cylinder Manufacturers:
 - 1. Best Access Systems.
 - 2. Schlage
 - 3. Substitutions: Section 01 60 00 - Product Requirements.

- C. Exit Device Manufacturers:
 1. Hager Companies.
 2. Sargent Manufacturing Company.
 3. Von Duprin, Inc.
 4. Yale Commercial Locks and Hardware.
 5. Substitutions: Section 01 60 00 - Product Requirements.
- D. Cylinder Manufacturers:
 1. Best Access Systems.
 2. Substitutions: Section 01 60 00 - Product Requirements.
- E. Controlled Access
 1. As called out on drawings.
 2. No substitutions permitted
- F. Closers Manufacturers:
 1. Corbin Russwin Architectural Hardware, Inc.
 2. Hager Companies
 3. LCN Closers.
 4. Norton Door Control.
 5. Substitutions: Section 01 60 00 - Product Requirements.
- G. Push/Pulls, Manual and Automatic Bolts, Protection Plates, Gaskets, Thresholds, and Trim Manufacturers:
 1. Hager Companies.
 2. Ives Commercial Hardware.
 3. National Guard Products.
 4. Pemko Manufacturing Co.
 5. Zero International, Inc.
 6. Substitutions: Section 01 60 00 - Product Requirements.

2.2 COMPONENTS

- A. General Hardware Requirements: Where not specifically indicated, comply with applicable ANSI A156 standard for type of hardware required. Furnish each type of hardware with accessories as required for applications indicated and for complete, finished, operational doors.
 1. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.
 2. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by hardware supplier or hardware manufacturer.
 3. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.
 - a. Finish: Match hardware item being fastened.
- B. Hinges: ANSI A156.1, full mortise type complying with following general requirements unless otherwise scheduled.
 1. Widths: Sufficient to clear trim projection when door swings 180 degrees.
 2. Number: Furnish minimum three hinges to 90 inches high, four hinges to 120 inches high for each door leaf.
 - a. Fire Rated Doors to 86 inches High: Minimum three hinges.
 - b. Doors over 40 inches Wide: Extra heavy weight ball or oilite bearing hinges.
 - c. Doors 1-3/4 inch Thick: 4 inch size.
 - d. Doors 2 inch Thick: 5 inch extra heavy weight ball or oilite bearing.
 - e. Doors over 48 inches Wide: 5 inch extra heavy weight ball or oilite bearing.
 3. Pins: Furnish nonferrous hinges with non-removable pins (NRP) at exterior and locked out swinging doors, non-rising pins at interior doors.

4. Tips: Flat button tips with matching plug.
- C. Locksets: Furnish locksets compatible with specified cylinders. Typical 2-3/4 inch backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt verify type of cutouts provided in metal frames.
 1. Cores: 7 pin IC
- D. Key Pad Access Control Devices: Furnish fully operational exit rim and cylindrical key pad locks.
 1. Best Access: EZ Series
 - a. Variable pin length 3-6 digits
 - b. Keying 7 pin IC
 - c. Maximum 50 users
 - d. Programming performed through key pad
- E. Latch Sets: Match locksets. Typical 2-3/4 inch backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt verify type of cutouts provided in metal frames.
- F. Exit Devices: ANSI A156.3, Grade 1 rim type, with cross bar, unless otherwise indicated. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt verify type of cutouts provided in metal frames,
 1. Types: Suitable for doors requiring exit devices.
- G. Cylinders: ANSI A156.5, Grade 1, interchangeable core type cylinders.
 1. Keying: 7 Pin IC.
 2. Include construction keying.
 3. Keys: Nickel silver. Stamp keys with "DO NOT DUPLICATE".
 4. Supply keys in the following minimum quantities:
 - a. 5 master keys.
 - b. 3 grand master keys.
 - c. 3 great grand master keys.
 - d. 3 construction keys.
 - e. 3 control keys and 3 extra cylinder cores.
 - f. 2 change keys for each lock.
- H. Closers: ANSI A156.4 modern type with cover, surface mounted closers; full rack and pinion type with steel spring and non-freezing hydraulic fluid; closers required for fire rated doors unless otherwise indicated.
 1. Adjustability: Furnish controls for regulating closing, latching, speeds, and back checking.
 2. Arms: Type to suit individual condition; parallel-arm closers at reverse bevel doors and where doors swing full 180 degrees.
 3. Location: Mount closers on inside of exterior doors, room side of interior doors typical; mount on pull side of other doors.
 4. Operating Pressure: Maximum operating pressure as follows.
 - a. Interior Doors: Maximum 5 pounds.
 - b. Exterior Doors: Maximum 8.5 pound.
 - c. Fire Rated Doors: As required for fire rating, maximum 15 pounds.
- I. Push/Pulls, Manual Bolts, Protection Plates, Gaskets, Thresholds, and Trim: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.
 1. Push/Pulls: ANSI A156.6; push plates minimum 0.050 inch thick. Furnish straight push-pull type pulls with bolts to secure from opposite door face; furnish with minimum 0.050 inch pull plates unless otherwise indicated.
 2. Manual Bolts: ANSI A156.16 Grade 1 top and bottom surface bolts, with dust-proof floor strike, unless otherwise indicated.

3. Kickplates: ANSI A156.6, metal; height indicated in Schedule by 2 inch less than door width; minimum 0.050 inch thick stainless steel.
4. Weatherstripping: Furnish continuous weatherstripping at top and sides of exterior doors.
5. Thresholds: Maximum 1/2 inch height.
6. Wall Stops: ANSI A156.1, Grade 1, concave pad wall stop with no visible screws.

2.3 ACCESSORIES

- A. Lock Trim: Furnish levers with as selected from manufacturer's full range of levers and roses.
 1. Do not permit through bolts on solid wood core doors.
- B. Through Bolts: Do not permit through bolts and grommet nuts on door faces in occupied areas unless no alternative is possible.
 1. Do not use through bolts on solid wood core doors.

2.4 FINISHING

- A. Finishes: ANSI A156.18; furnish following finishes except where otherwise indicated in Schedule at end of section.
 1. Hinges:
 - a. As indicated on Drawings
 2. Typical Exterior Exposed and High Use Interior Door Hardware:
 - a. As indicated on Drawings
 3. Typical Interior Door Hardware:
 4. Match Existing Hardware Closers: Finish appearance to match door hardware on same face of door.
 - a. As indicated on Drawings
 5. Thresholds: Finish appearance to match door hardware on exterior face of door.
 - a. As indicated on Drawings
 6. Other Items: Furnish manufacturer's standard finishes to match similar hardware types on same door, and maintain acceptable finish considering anticipated use and BHMA category of finish.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution
- B. Verify doors and frames are ready to receive door hardware and dimensions are as indicated on shop drawings.

3.2 INSTALLATION

- A. Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.
- B. Mounting Heights from Finished Floor to Center Line of Hardware Item: Comply with manufacturer recommendations and applicable codes where not otherwise indicated.
 1. Locksets: 38 inch.
 2. Push/Pulls: 42 inch.
 3. Dead Locks: 48 inch.
 4. Cross Bar Type Exit Devices: 38 inch.
 5. Top Hinge: Jamb manufacturer's standard, but not greater than 10 inches from head of frame to center line of hinge.
 6. Bottom Hinge: Jamb manufacturer's standard, but not greater than 12-1/2 inches from floor to center line of hinge.

7. Intermediate Hinges: Equally spaced between top and bottom hinges and from each other.

3.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.4 ADJUSTING

- A. Section 01 73 00 - Execution: Starting and adjusting.
- B. Adjust hardware for smooth operation.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protecting installed construction.
- B. Do not permit adjacent work to damage hardware or hardware finish.

3.6 SCHEDULES

- A. Refer to Door Schedule in Drawings

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass glazing for metal frames, doors, windows, and glazed walls.
- B. Related Sections:
 - 1. Section 07 90 00 - Joint Protection: Sealant and back-up material other than glazing sealants.
 - 2. Section 08 13 14 - Standard Steel Doors.
 - 3. Section 08 14 16 - Flush Wood Doors: Glazed doors.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI Z97.1 - Safety Glazing Materials Used in Buildings Safety.
- B. ASTM International:
 - 1. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
 - 2. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
 - 3. ASTM C1036 - Standard Specification for Flat Glass.
 - 4. ASTM C1193 - Standard Guide for Use of Joint Sealants.
 - 5. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 6. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 7. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
 - 8. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
- C. Consumer Products Safety Commission:
 - 1. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing.
- D. Glass Association of North America:
 - 1. GANA - Sealant Manual.
 - 2. GANA - Glazing Manual.
 - 3. GANA - Laminated Glass Design Guide.
- E. National Fenestration Rating Council Incorporated:
 - 1. NFRC 100 - Procedures for Determining Fenestration Product U-Factors.
 - 2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
- F. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
 - 1. In conjunction with materials described in 07 90 00.

2. To utilize inner pane of multiple pane sealed units for continuity of air barrier and vapor retarder seal.
 3. To maintain continuous air barrier and vapor retarder throughout glazed assembly from glass pane to heel bead of glazing sealant. Structural Design: Design in accordance with applicable code for most critical combination of wind, snow, seismic, and dead loads.
- B. Wind Loads: Design and size glass to withstand positive and negative wind loads acting normal to plane of wall, including increased loads at building corners.
 - C. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with applicable code.
 - D. Exterior Glass Deflection: Maximum of 1/175 of glass edge length or 3/4 inch, whichever is less with full recovery of glazing materials.
 - E. Interior Glass Deflection: Maximum differential deflection for two adjacent unsupported edges when 50 plf forces is applied to one panel at any point up to 42 inches above finished floor less than thickness of glass.
 - F. Thermal and Solar Optical Performance: Measured or calculated in accordance with the following:
 1. Maximum U-Values: Comply with ICC IEBC for climate zone in which project is located. Measure in accordance with NFRC 100.
 2. Maximum SHGC: Comply with ICC IEBC for climate zone in which project is located. Measure in accordance with NFRC 200.
 3. Solar Optical Properties: NFRC 300.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data:
 1. Glass: Provide structural, physical, and thermal and solar optical performance characteristics, size limitations, and special handling or installation requirements.
 2. Glazing Sealants, Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors were exposed.
- C. Samples:
 1. Glass: Submit two samples 6 x 6 inch in size, illustrating each glass units, coloration and design.
- D. Manufacturer's Certificate: Certify sealed insulating glass, meets or exceeds specified requirements.
- E. Installer's Certificate: Certify glass furnished without identification label is installed in accordance with Construction Documents and applicable code.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual, GANA Sealant Manual, and GANA Laminated Glass Design Guide for glazing installation methods.

1.6 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum three years experience approved by manufacturer.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.

- B. Do not install glazing when ambient temperature is less than 50 degrees F.
- C. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.8 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Warranties.
- B. Furnish ten year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Glass
 - 1. ACH Glass Operations.
 - 2. AFG Industries, Inc.
 - 3. Guardian Industries Corp.
 - 4. PPG Industries.
 - 5. Pilkington North America, Inc.
 - 6. Substitutions: Section 01 60 00 - Product Requirements.

2.2 FLOAT GLASS MATERIALS

- A. Annealed Glass: ASTM C1036, Type 1 transparent flat, Quality Q3, float glass.
 - 1. Furnish annealed glass except where heat strengthened or tempered glass is required to meet specified performance requirements.
- B. Tempered Glass: ASTM C1048, Type 1 transparent flat, Quality Q3, Kind FT fully tempered, Condition an uncoated, float glass with horizontal tempering.
 - 1. Furnish tempered glass conforming to CPSC 16 CFR 1201 Category II at locations where safety glass is required by applicable code.

2.3 FLOAT GLASS PRODUCTS

- A. Clear Glass: Annealed and Tempered float glass as specified; Class 1 clear.
 - 1. Clear annealed glass.
 - 2. Clear tempered glass.
 - 3. Minimum Thickness: 1/4 inch.
 - 4. Visible Light Transmittance: 91percent minimum.
 - 5. Solar Heat Gain Coefficient: .89 maximum.
 - 6. Minimum Thickness: 1/4 inch.
- B. Low E Glass: Annealed and Tempered float glass as specified; Class 1 clear.
 - 1. Clear Low E annealed glass.
 - 2. Clear Low E tempered glass.
 - 3. Minimum Thickness: 1/4 inch.
 - 4. Coating: ASTM C1376; pyrolytic.

2.4 INSULATING GLASS PRODUCTS

- A. Insulating Glass: ASTM E2190; with glass elastomer glass to mastic silicone sealant edge seal; place reflective film within unit; purge interpane space with dry hermetic air.
 - 1. Total Unit Thickness: 1 inch.
 - 2. Insulating Glass Unit Edge Seal Construction: Aluminum, or Stainless steel, thermally broken, bent and soldered mitered and spigot corners.
 - 3. Insulating Glass Unit Edge Seal Material: clear color.
- B. Double Pane Insulating Vision Glass:

1. Outer Pane: Clear Low E annealed glass.
2. Inner Pane: Clear annealed glass.
3. U-Factor Winter Nighttime: .35 maximum.
4. U-Factor Summer: .35 maximum.
5. Solar Energy Transmittance: 52 percent minimum.
6. Visible Light Transmittance: 74 percent minimum.
7. Solar Heat Gain Coefficient: .62 maximum.
- 8.

C. GLAZING SEALANTS

D. Elastomeric Glazing Sealants: Materials compatible with adjacent materials including glass, insulating glass seals, and glazing channels.

1. Glazing Compounds: As recommended by manufacturer.

2.5 GLAZING ACCESSORIES

A. Setting Blocks: As recommended by manufacturer.

B. Spacer Shims: As recommended by manufacturer.

C. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 73 00 - Execution

B. Verify openings for glazing are correctly sized and within acceptable tolerance.

C. Verify surfaces of glazing channels or recesses are clean, free of obstructions impeding moisture movement; weeps are clear, and ready to receive glazing.

3.2 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION

A. Perform installation in accordance with GANA Glazing Manual.

1. Glazing Sealants: Comply with ASTM C119 Interior Dry Method (Tape and Tape) Installation:
2. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
3. Place setting blocks at ¼ points with edge block no more than 6 inches from corners.
4. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
5. Place glazing tape on free perimeter of glazing in same manner described above.
6. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
7. Knife trim protruding tap.

3.4 CLEANING

A. Section 01 77 00 - Closeout Procedures: Final cleaning.

B. Remove glazing materials from finish surfaces.

C. Remove labels after Work is complete.

D. Clean glass and adjacent surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 73 00 - Execution: Protecting installed construction.

B. After installation, mark pane with an 'X' by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

END OF DIVISION

DIVISION 09 FINISHES

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Gypsum board and joint treatment
 - 2. Tile & Epoxy backer board
 - 3. Acoustic insulation
 - 4. Textured finishes
- B. Related Requirements:
 - 1. Section 06 10 00 - Rough Carpentry: Building wood framing system
 - 2. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood support blocking
 - 3. Section 06 10 53 - Miscellaneous Rough Carpentry: Product requirements for frames for washroom accessories for placement by this section
 - 4. Section 07 21 16 - Blanket Insulation: Acoustic and Thermal insulation

1.2 REFERENCE STANDARDS

- A. ASTM International:
 - 1. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board
 - 2. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing
 - 3. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
 - 4. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board
 - 5. ASTM C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases
 - 6. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing
 - 7. ASTM C1288 - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets
 - 8. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets
 - 9. ASTM C1396/C1396M - Standard Specification for Gypsum Board
 - 10. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
 - 11. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
 - 12. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials
- B. Gypsum Association:
 - 1. GA 214 - Recommended Levels of Gypsum Board Finish
 - 2. GA 216 - Application and Finishing of Gypsum Board
 - 3. GA 600 - Fire Resistance Design Manual Sound Control
- C. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings
- D. National Fire Protection Association:

1. NFPA 265 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls, Method B
2. NFPA 286 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Wall and Ceiling Interior Finish

- E. Underwriters Laboratories Inc.:
1. UL - Fire Resistance Directory

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals
- B. Product Data: Submit data on metal framing, gypsum board, joint tape; and acoustic accessories

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C840, GA-214, GA-216 and GA-600

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience

PART 2 - PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

- A. Manufacturers:
 1. CertainTeed Corporation.
 2. Georgia-Pacific Gypsum LLC.
 3. National Gypsum Company.
 4. USG Corporation.
 5. Substitutions: Section 01 60 00 - Product Requirements
- B. Performance / Design Criteria:
 1. Select stud thickness to resist minimum 5 psf uniform load and maximum 1/360 deflection.

2.2 COMPONENTS

- A. Gypsum Board: ASTM C1396/C1396M; Type X fire resistant where indicated on Drawings
 1. Standard Gypsum Board: Thickness as indicated on the drawings; maximum available length in place; ends square cut, tapered and beveled edges
 2. Moisture Resistant Gypsum Board: Thickness as indicated on the drawings; maximum available length in place; ends square cut, tapered and beveled edges

2.3 ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced, Thickness as indicated on the drawings
- B. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board
- C. Gypsum Board Accessories: ASTM C1047; metal plastic, metal and paper combination; corner beads, edge trim, and expansion joints
 1. Metal Accessories: Galvanized steel
 2. Plastic Accessories: PVC plastic or ABS plastic
 3. Edge Trim: Type LC, L, and U bead

- D. Joint Materials: ASTM C475/C475M; reinforcing tape, joint compound, and water
 - 1. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 2. Prefilling: At open joints rounded or beveled panel edges and damaged surface areas, use setting-type taping compound.
 - 3. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping or drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 4. Fill Coat: For second coat drying-type, all-purpose compound.
 - 5. Finish Coat: For third coat, use drying-type, all-purpose compound.
 - 6. Skim Coat: For final coat of Level 5 finish, use [setting-type, sandable topping drying-type, all-purpose compound or high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish
 - 7. No lite weight topping compounds allowed for finishing purposes.
- E. Gypsum Board Screws: ASTM C954; length to suit application
 - 1. Screws for Steel Framing: Type S
 - 2. Screws for Wood Framing: Type W
- F. Drywall "J" Molding Trim:
 - 1. Manufacturer: Fry Reglet
 - a. Finish: Anodized Silver
 - b. Model: JDM-625
- G. Drywall Wall to Ceiling Transition: W Reveal
 - 1. Manufacturer: Fry Reglet
 - a. Finish: White
 - b. Model: DRWT-75-75

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Requirements for installation examination
- B. Verify site conditions are ready to receive work and opening dimensions are as indicated on drawings

3.2 INSTALLATION

- A. Wall Furring Installation:
 - 1. Erect wall furring for direct attachment to concrete masonry walls
 - 2. Erect furring channels vertically; space maximum 24 inches oc, not more than 4 inches from abutting walls
 - a. Secure in place on alternate channel flanges at maximum 24 inches on center
 - 3. Install thermal insulation between Z-furring channels directly attached to concrete masonry walls
- B. Acoustic Accessories Installation:
 - 1. Install resilient channels at maximum 24 inches on center
 - a. Locate joints over framing members
 - 2. Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions
 - 3. Install acoustic sealant at gypsum board perimeter at:
 - a. Metal Framing: One beads

- b. Seal penetrations of partitions by conduit, pipe, duct work, and rough-in boxes
- C. Gypsum Board Installation:
 - 1. Install gypsum board in accordance with GA-216. Install moisture resistant gypsum board on walls and ceilings where plumbing fixtures, water heaters, or equipment plumbed with water is present.
 - 2. Erect single layer board in most economical direction, with ends and edges occurring over firm bearing
 - 3. Erect single layer fire rated gypsum board in most economical direction, with edges and ends occurring over firm bearing
 - 4. Use screws when fastening gypsum board to metal furring or framing
 - 5. Use screws when fastening gypsum board to wood furring or framing
 - 6. Place corner beads at external corners Use longest practical length
 - 7. Place edge trim where gypsum board abuts dissimilar materials
 - 8. Install cementitious backing board over metal studs
 - 9. Install cementitious backing board over metal studs in all areas called out to receive Epoxy Wall Coating
- D. Joint Treatment:
 - 1. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes
 - 2. Feather coats on to adjoining surfaces so that camber is maximum 1/32 inch
 - 3. Tape joints to a minimum Level 5 Finish
 - 4. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile
 - 5. Fill and finish joints and corners of cementitious backing board
- E. Finish: Smooth Level 5 Finish

3.3 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances
- B. Maximum Variation of Finished Gypsum Board Surface from Flat Surface: 1/8 inch in 10 feet

END OF SECTION

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes metal stud framing and accessories at interior locations
- B. Related Sections:
 - 1. Section 06 10 53 - Miscellaneous Rough Carpentry: Rough wood blocking within stud framing
 - 2. Section 07 21 16 - Blanket Insulation: Insulation between framing members

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 2. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members
 - 3. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
 - 4. ASTM C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases
- B. National Association of Architectural Metal Manufacturers:
 - 1. NAAMM ML/SFA 540 - Lightweight Steel Framing Systems Manual

1.3 SYSTEM DESCRIPTION

- A. Interior Walls: Metal stud framing system with batt type acoustic insulation specified in Section 09 21 16, interior gypsum board specified in Section 09 21 16
- B. Maximum Allowable Deflection: 1:600 span
- C. Wall System:
 - 1. Design to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges
 - 2. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings

1.4 PERFORMANCE REQUIREMENTS

- A. Select stud thickness to resist minimum 5 psf uniform load and maximum 1/360 deflection

1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit data describing standard framing member materials and finish, product criteria, load charts, and limitations

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C754 or NAAMM ML/SFA 540

- B. Form, fabricate, install, and connect components in accordance with NAAMM ML/SFA 540
- C. Furnish framing materials in accordance with SSMA - Product Technical Information

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience
 - 1. Framing Manufacturer: Current member of Steel Stud Manufacturers Association
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience

1.8 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination
- B. Coordinate placement of components within stud framing system specified in Sections

PART 2 - PRODUCTS

2.1 METAL FRAMING SYSTEM

- A. Manufacturers:
 - 1. Clark Steel Framing Systems
 - 2. Dietrich Industries, Inc.
 - 3. Harrison Manufacturing Co.
 - 4. Marino/Ware
 - 5. Unimast Incorporated
 - 6. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPONENTS

- A. Studs: ASTM A653/A653M, non-load bearing rolled steel, channel shaped, punched for utility access, as follows:
 - 1. Depth: As shown on the drawings
 - 2. Thickness:
 - a. Interior Walls: 25 gauge with 22 gauge at jambs of all openings.
- B. Tracks and Headers: Same material and thickness as studs, bent leg retainer notched to receive studs
 - 1. Ceiling Runners: With extended leg retainer
- C. Furring and Bracing Members: Of same material as studs; thickness to suit purpose
- D. Fasteners: ASTM C1002; Type S; length to suit application
- E. Sheet Metal Backing: 20 gauge galvanized steel for reinforcement of
- F. Anchorage Devices: Power actuated
- G. Shaft Wall Studs: 20 gauge CT studs and J-tabbed track, 4" overall depth, designed for use with 1" thick gypsum panels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution
- B. Verify rough-in utilities are in proper location

3.2 INSTALLATION

- A. Align and secure top and bottom runners at 24 inches oc
- B. Place one beads of acoustic sealant between runners and substrate, studs and adjacent construction to achieve acoustic seal
- C. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs
- D. Install studs vertically at 16 inches oc
- E. Align stud web openings horizontally
- F. Secure studs to tracks using fastener method
 - 1. Do not weld
- G. Stud splicing not permissible
- H. Fabricate corners using minimum of three studs
- I. Double stud at wall openings, door and window jambs, not more than 2 inches from each side of openings
- J. Brace stud framing system rigid
- K. Coordinate erection of studs with requirements of door frames and window frames; install supports and attachments
- L. Coordinate installation of wood bucks, anchors, and wood blocking with electrical and mechanical work to be placed within or behind stud framing
- M. Backing: Install backing for support of plumbing fixtures, wall cabinets, toilet accessories, hardware, and opening frames
 - 1. Secure 20 gauge fat strapping width as required with minimum of 6" width
- N. Extend stud framing to ceiling only. Attach ceiling runner securely to ceiling framing in accordance with details indicated
- O. Coordinate placement of insulation in stud spaces after stud frame erection

3.3 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances
- B. Maximum Variation From Indicated Position: 1/8 inch in 10 feet
- C. Maximum Variation From Plumb: 1/8 inch in 10 feet

END OF SECTION

SECTION 09 51 13

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Acoustic panels
 - 2. Suspended metal grid ceiling system and perimeter trim
- B. Related Requirements:
 - 1. Section 07 90 00 - Joint Protection

1.2 REFERENCE STANDARDS

- A. ASTM International:
 - 1. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
 - 2. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
 - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
 - 4. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials
 - 5. ASTM E580/E580M - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint
 - 6. ASTM E1264 - Standard Classification for Acoustical Ceiling Products
- B. American Society of Civil Engineers:
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures
- C. Ceilings and Interior Systems Construction Association:
 - 1. CISCA - Acoustical Ceilings: Use and Practice

1.3 SEQUENCING

- A. Section 01 10 00 - Summary: Requirements for sequencing
- B. Sequence Work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved
- C. Install acoustic units after interior wet work is dry

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals
- B. Product Data: Submit data on metal grid system components and acoustic units
 - 1. Indicate installation details required for seismic design loads

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures: Requirements for maintenance materials
- B. Extra Stock Materials:

1. Furnish two percent of total acoustic unit area of extra panels to Owner

1.6 QUALITY ASSURANCE

A. Conform to CISCA requirements

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years documented experience

B. Installer: Company specializing in performing work of this section with minimum three years documented experience approved by manufacturer

1.8 AMBIENT CONDITIONS

A. Section 01 50 00 - Temporary Facilities and Controls: Ambient conditions control facilities for product storage and installation

B. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustic unit installation

PART 2 - PRODUCTS

2.1 SUSPENDED ACOUSTICAL CEILINGS

A. Manufacturer

1. Armstrong World Industries, Inc. Style: Dune Tegular
2. CertainTeed Corporation.
3. Chicago Metallic Corporation.
4. USG Interiors, Inc.
5. Substitutions: Section 01 60 00 - Product Requirements

B. Performance / Design Criteria:

1. Suspension System: Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1/360 of span.
2. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated according to ASCE 7 and applicable codes for Seismic Design Category.

2.2 COMPONENTS

A. Acoustic Panels : ASTM E1264, conforming to the following:

1. Size 2'X2' X 15/16"
2. Edge: Shadow Line Tapered
3. Color: White
4. Basis of Design: Angle Dume Tegular
5. Grid:
 - a. Grid Materials: Commercial quality cold rolled steel with galvanized coating
 - b. Exposed Grid Surface Width: 15/16"
 - c. Perimeter Molding Width: Minimum 7/8 inch
 - d. Grid Finish: White
 - e. Accessories: Stabilizer bars, clips, splices, perimeter moldings, and hold down clips required for suspended grid system and as required by applicable code for seismic design category
6. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified

2.3 ACCESSORIES

- A. Touch-up Paint: Type and color to match acoustic and grid units

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Requirements for installation examination
- B. Verify layout of hangers will not interfere with other work

3.2 DEMOLITION

- A. Extend existing acoustical ceiling installations using materials and methods as specified
- B. Clean and repair existing acoustical ceilings which remain or are to be reinstalled

3.3 INSTALLATION

A. Lay-In Grid Suspension System:

1. Install suspension system in accordance with ASTM C635, ASTM C636 and as supplemented in this section
2. Install suspension system in accordance with ASCE 7, ASTM E580/E580M and CISCA for applicable Seismic Zone
3. Install system capable of supporting imposed loads with maximum deflection of 1/360 maximum
4. Lay out system to balanced grid design with edge units no less than 50 percent of acoustic unit size
 - a. Arrange system with long dimension of tile perpendicular to long dimension of the space unless noted on the drawings
5. Locate system on room axis according to reflected plan
6. Install after major above ceiling work is complete
 - a. Coordinate location of hangers with other work
7. Install hanger clips during steel deck erection
 - a. Install additional hangers and inserts as required
8. Hang suspension system independent of walls, columns, ducts, pipes and conduit
 - a. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members
9. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance
 - a. Do not support hanger off of ducts
10. Do not support components on main runners or cross runners when weight causes total dead load to exceed deflection capability
 - a. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently
11. Do not eccentrically load system, or produce rotation of runners
12. Perimeter Molding:
 - a. Install edge molding at intersection of ceiling and vertical surfaces
 - b. Use longest practical lengths
 - c. Miter corners
 - d. Install at junctions with other interruptions
13. Form expansion joints as detailed
 - a. Form to accommodate plus or minus 1 inch movement
 - b. Maintain visual closure

B. Acoustic Units:

1. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function

2. Lay directional patterned units one way with pattern parallel to shortest room axis.
Fit border trim neatly against abutting surfaces
3. Install units after above ceiling work is complete
4. Install acoustic units level, in uniform plane, and free from twist, warp, and dents
5. Cutting Acoustic Units:
 - a. Cut to fit irregular grid and perimeter edge trim
 - b. Double cut and field paint exposed edges of tegular units.
6. Install hold-down clips to retain panels tight to grid system within 20 ft of exterior door

C. Tectum Units:

1. Install tight to bottom of metal building purlin
2. Refer to manufacturer for surface mounting and connections to bottom of purlin
3. Install units after above ceiling work is complete and mechanical, electrical, and plumbing rough-in is complete
4. Double cut and field paint exposed edges of tegular units.

3.4 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances
- B. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet
- C. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees

END OF SECTION

SECTION 09 65 00

RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Resilient sheet flooring
 - 2. Resilient tile flooring
 - 3. Resilient base

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile
 - 2. ASTM F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing
 - 3. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile
 - 4. ASTM F1861 - Standard Specification for Resilient Wall Base
- B. Federal Specification Unit:
 - 1. FS L-F-475 - Floor Covering Vinyl, Surface (Tile and Roll), with Backing
 - 2. FS RR-T-650 - Treads, Metallic and Nonmetallic, Skid Resistant
- C. National Fire Protection Association:
 - 1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Shop Drawings: Indicate seaming plan, custom patterns and inlay designs
- C. Product Data: Submit data describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions
- D. Samples:
 - 1. Submit manufacturer's complete set of color samples for initial selection
 - 2. Submit two samples illustrating color and pattern for each resilient flooring product specified

1.4 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures: Closeout Submittals
- B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements
- B. Protect roll materials from damage by storing on end

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements
- B. Maintain temperature in storage area between 55 degrees F and 90 degrees F
- C. Store materials for not less than 48 hours prior to installation in area of installation at temperature of 70 degrees F to achieve temperature stability
 - 1. Thereafter, maintain conditions above 55 degrees F

1.8 EXTRA MATERIALS

- A. Section 01 78 23 - Operation and Maintenance Data
- B. Furnish:
 - 1. Flooring: 25 sq ft of each type and color specified
 - 2. Base: 25 lineal feet of each type and color specified

PART 2 - PRODUCTS

2.1 TILE FLOORING

- A. Manufacturers:
 - 1. Shaw Industries Group, Inc.
 - 2. Mannington Mills, Inc
 - 3. Johnsonite
 - 4. Armstrong World Industries
 - 5. Substitutions: Not permitted
- B. Products, colors and patterns as indicated in Drawings.

2.2 RESILIENT BASE

- A. Manufacturers:
 - 1. Johnsonite
 - 2. Substitutions: Section 01 60 00 - Product Requirements
- B. Products:
 - 1. Color and profile as indicated in Drawings.

2.3 ACCESSORIES

- A. Subfloor Filler: Type recommended by adhesive material manufacturer
- B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer
- C. Moldings and Edge Strips: Rubber or Vinyl.
- D. Filler for Coved Base: Plastic
- E. Sealer and Wax: Types recommended by flooring manufacturer

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution
- B. Verify concrete floors are dry to maximum moisture content as recommended by manufacturer, and exhibit negative alkalinity, carbonization, and dusting
- C. Verify floor and lower wall surfaces are free of substances capable of impairing adhesion of new adhesive and finish materials

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps
- B. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface
- C. Prohibit traffic until filler is cured
- D. Clean substrate
- E. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION - SHEET FLOORING

- A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams
 - 1. Lay out seams to avoid widths less than 1/3 of roll width; match patterns carefully at seams
- B. Double cut sheet; provide chemically bonded seams.
- C. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door
- D. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated
 - 1. Secure resilient strips by adhesive
- E. Install covered base as detailed on drawings, using covered base filler as backing at floor to wall junction
 - 1. Extend sheet flooring vertically to height indicated , and cover top edge with metal cap strip
- F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints

3.4 INSTALLATION - TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed
- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern
- C. Install tile to monolith pattern
 - 1. Allow minimum 1/2 full size tile width at room or area perimeter
- D. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints
- E. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door

- F. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated

3.5 INSTALLATION - BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints
- B. Miter internal corners. At external corners, use pre-molded units. At exposed ends, use pre-molded units
- C. Install base on solid backing
 - 1. Bond tightly to wall and floor surfaces
- D. Scribe and fit to door frames and other interruptions

3.6 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning
- B. Remove excess adhesive from floor, base, and wall surfaces without damage
- C. Clean, seal, and maintain resilient flooring products

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01 73 00 - Execution: Protecting installed construction
- B. Prohibit traffic on resilient flooring for 48 hours after installation

3.8 SCHEDULE

- A. Refer to Room Finish Schedule and Floor Finishes Plan

END OF SECTION

SECTION 09 90 00

PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and field application of paints, stains, varnishes, and other coatings
- B. Related Sections:
 - 1. Section 05 50 00 - Metal Fabrications: Shop primed items
 - 2. Section 09 21 16 - Gypsum Board Assemblies: Texturing Gypsum Board Walls

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications
 - 2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials
 - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
- B. Green Seal:
 - 1. GS-03 - Anti-Corrosive Paints.
 - 2. GS-11 - Paints and Coatings.
- C. Painting and Decorating Contractors of America:
 - 1. PDCA - Architectural Painting Specification Manual
- D. SSPC: The Society for Protective Coatings:
 - 1. SSPC - Steel Structures Painting Manual

1.3 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit data on finishing products and special coating
- C. Samples:
 - 1. Submit paper chip samples illustrating range of colors and textures available for each surface finishing product scheduled

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures
- B. Operation and Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces
- C. Provide a minimum of one gallon of each paint color and finish for owners attic stock.

1.6 QUALITY ASSURANCE

- A. Surface Burning Characteristics:

1. Fire Retardant Finishes: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years documented experience
- B. Applicator: Company specializing in performing work of this section with minimum five years documented experience

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability
- C. Container Label Include:
 1. Manufacturer's Name
 2. Type of Paint
 3. Brand Name
 4. Lot Number
 5. Brand Code
 6. Coverage
 7. Surface Preparation
 8. Drying Time
 9. Cleanup Requirements
 10. Color Designation
 11. Instructions for Mixing and Reducing
- D. Paint Materials: Store at minimum ambient temperature of 45 degrees F and maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer
- C. Do not apply exterior coatings during rain or snow when relative humidity is outside humidity ranges, or moisture content of surfaces exceed those required by paint product manufacturer
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions
- E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions
- F. Provide lighting level of 80 ft candle measured mid-height at substrate surface

1.10 SEQUENCING

- A. Section 01 10 00 - Summary: Work sequence
- B. Sequence application to the following:
 1. Do not apply finish coats until paintable sealant is applied
 2. Back prime wood trim before installation of trim

1.11 WARRANTY

- A. Section 01 77 00 - Closeout Procedures: Product warranties and product bonds

- B. Furnish five year manufacturer warranty for paints and coatings

1.12 EXTRA MATERIALS

- A. Section 01 78 23 - Operation and Maintenance Data: Spare parts and maintenance products

PART 2 - PRODUCTS

2.1 PAINTS AND COATINGS

- A. Manufacturers:
 - 1. Benjamin Moore & Co.
 - 2. PPG Paints; PPG Industries, Inc.
 - 3. Rodda Paint Co.
 - 4. Sherwin-Williams Company
 - 5. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPONENTS

- A. Coatings: Ready mixed, except field catalyzed coatings
 - 1. Prepare coatings:
 - a. To soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating
 - b. For good flow and brushing properties
 - c. Capable of drying or curing free of streaks or sags
- B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve finishes specified; commercial quality
- C. Patching Materials: Latex filler
- D. Fastener Head Cover Materials: Latex filler

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions
- B. Verify surfaces and substrate conditions are ready to receive Work as instructed by product manufacturer
- C. Examine surfaces scheduled to be finished prior to commencement of work
 - 1. Report conditions capable of affecting proper application
- D. Test shop applied primer for compatibility with subsequent cover materials
- E. Measure moisture content of surfaces using electronic moisture meter
 - 1. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - a. Plaster and Gypsum Wallboard: 12 percent
 - b. Masonry, Concrete, and Concrete Unit Masonry: 12 percent
 - c. Interior Wood: 15 percent, measured in accordance with ASTM D4442
 - d. Concrete Floors: 8 percent

3.2 PREPARATION

- A. Aluminum Surfaces Scheduled for Paint Finish:
 - 1. Remove surface contamination by steam or high pressure water
 - 2. Remove oxidation with acid etch and solvent washing

3. Apply etching primer immediately following cleaning
- B. Asphalt, Creosote, or Bituminous Surfaces Scheduled for Paint Finish:
 1. Remove foreign particles to permit adhesion of finishing materials
 2. Apply compatible sealer or primer
- C. Insulated Coverings:
 1. Remove dirt, grease, and oil from canvas and cotton
- D. Concrete Floors:
 1. Remove contamination, acid etch, and rinse floors with clear water
 2. Verify required acid-alkali balance is achieved
 3. Allow to dry.
- E. Copper Surfaces Scheduled for Paint Finish:
 1. Remove contamination by steam, high pressure water, or solvent washing
 2. Apply vinyl etch primer immediately following cleaning.
- F. Copper Surfaces Scheduled for Natural Oxidized Finish:
 1. Remove contamination by applying oxidizing solution of copper acetate and ammonium chloride in acetic acid
 2. Rub on repeatedly for required effect
 3. Once attained, rinse surfaces with clear water and allow to dry
- G. Gypsum Board Surfaces:
 1. Fill minor defects with filler compound
 2. Spot prime defects after repair
- H. Galvanized Surfaces:
 1. Remove surface contamination and oils and wash with solvent
 2. Apply coat of etching primer
- I. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish:
 1. Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter
 2. Remove oil and grease with solution of tri-sodium phosphate
 - a. Rinse well and allow to dry
 3. Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water
 - a. Allow to dry.
- J. Plaster Surfaces:
 1. Fill hairline cracks, small holes, and imperfections with latex patching plaster
 2. Make smooth and flush with adjacent surfaces
 3. Wash and neutralize high alkali surfaces
- K. Uncoated Steel and Iron Surfaces:
 1. Remove grease, mill scale, weld splatter, dirt, and rust
 2. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent
 3. Apply treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned
 4. Spot prime paint after repairs
- L. Shop Primed Steel Surfaces:
 1. Sand and scrape to remove loose primer and rust
 2. Feather edges to make touch-up patches inconspicuous
 3. Clean surfaces with solvent
 4. Prime bare steel surfaces
- M. Interior Wood Items Scheduled to Receive Paint Finish:
 1. Wipe off dust and grit prior to priming
 2. Seal knots, pitch streaks, and sappy sections with sealer

- 3. Fill nail holes and cracks after primer has dried; sand between coats
- N. Interior Wood Items Scheduled to Receive Transparent Finish:
 - 1. Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer
 - 2. Fill nail holes and cracks after sealer has dried; sand lightly between coats
- O. Wood Doors Scheduled for Painting:
 - 1. Seal wood door top and bottom edge surfaces with clear sealer
- P. Metal Doors Scheduled for Painting: Prime metal door top and bottom edge surfaces
- Q. Exterior Wood
 - 1. Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer
 - 2. Fill nail holes and cracks after sealer has dried; sand lightly between coats

3.3 APPLICATION

- A. Do not apply finishes to surfaces that are not dry
 - 1. Allow applied coats to dry before next coat is applied
- B. Apply each coat to uniform appearance
 - 1. Apply each coat of paint slightly darker than preceding coat unless specified otherwise
- C. Sand wood and metal surfaces lightly between coats to achieve required finish
- D. Vacuum clean surfaces of loose particles
 - 1. Use tack cloth to remove dust and particles just prior to applying next coat
- E. Where clear finishes are required, tint fillers to match wood
 - 1. Work fillers into grain before set
 - 2. Wipe excess from surface.
- F. Prime concealed surfaces of interior and exterior woodwork with primer paint
- G. Prime concealed surfaces of interior wood surfaces scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with thinner
- H. Finishing Mechanical And Electrical Equipment:
 - 1. Paint shop primed equipment
 - 2. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately
 - 3. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports except where items are shop finished
 - 4. Paint interior surfaces of air ducts and convector and baseboard heating cabinets visible through grilles and louvers with one coat of flat black paint to visible surfaces
 - 5. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels
 - 6. Paint exposed conduit and electrical equipment occurring in finished areas
 - 7. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment
 - 8. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing

3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing

3.5 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Final cleaning
- B. Collect waste material which may constitute fire hazard, place in closed metal containers, and remove daily from site

3.6 SCHEDULE - SHOP PRIMED ITEMS FOR SITE FINISHING

- A. Metal Fabrications (Section 05 50 00).

3.7 SCHEDULE - EXTERIOR SURFACES

- A. Pavement Markings:
 - 1. Two coats of solvent based acrylic copolymer paint, yellow
- B. Exposed Concrete Masonry Units,
 - 1. Two coats of 100% clear waterproof sealer
- C. Exposed Veneer Brick Units,
 - 1. Two coats of 100% clear waterproof sealer
- D. Steel - Unprimed:
 - 1. One coat of alkyd primer
 - 2. Two coats of alkyd enamel, gloss or semi-gloss
- E. Steel - Shop Primed:
 - 1. Touch-up with zinc chromate primer.
 - 2. Two coats of alkyd enamel, gloss or semi-gloss
- F. Steel - Galvanized:
 - 1. One coat galvanize primer
 - 2. Two coats of alkyd enamel, gloss or semi-gloss
- G. Aluminum - Mill Finish:
 - 1. One coat etching primer
 - 2. Two coats of alkyd enamel, gloss or semi-gloss
- H. Wood - Transparent:
 - 1. Filler coat (for open grained wood only)
 - 2. One coat of stain
 - 3. Two coats of varnish, gloss

3.8 SCHEDULE - INTERIOR SURFACES

- A. Wood - Painted:
 - 1. One coat of alkyd prime sealer
 - 2. Two coats of pre-catalyzed water-based epoxy, gloss or semi-gloss
- B. Wood - Transparent:
 - 1. Filler coat (for open grained wood only)
 - 2. One coat of stain
 - 3. Two coats of varnish, gloss
- C. Concrete, Concrete Masonry Units Painted:
 - 1. One coat of block filler
 - 2. Two coats of latex, semi-gloss
- D. Concrete Masonry Units (Not Painted),
 - 1. Two coats of 100% clear waterproof sealer
- E. Steel - Unprimed:
 - 1. One coat of latex primer
 - 2. Two coats of pre-catalyzed water-based epoxy, gloss or semi-gloss

- F. Steel - Primed:
 - 1. Touch-up with latex primer.
 - 2. Two coats of pre-catalyzed water-based epoxy, gloss or semi-gloss
- G. Steel - Galvanized:
 - 1. One coat galvanize primer
 - 2. Two coats of pre-catalyzed water-based epoxy, gloss or semi-gloss
- H. Aluminum - Mill Finish:
 - 1. One coat etching primer
 - 2. Two coats of pre-catalyzed water-based epoxy, gloss or semi-gloss
- I. Gypsum Board Walls and Ceilings:
 - 1. One coat of latex primer sealer
 - 2. Two coats latex acrylic enamel, egg shell

END OF DIVISION

DIVISION 10 SPECIALTIES

SECTION 10 14 00

SIGNAGE

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes interior signs.

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign.
- C. Samples: Submit two signs, large enough in size illustrating type, style, letter font, and colors specified; method of attachment.
- D. Manufacturer's Installation Instructions: Submit installation template and attachment devices.

1.3 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Package signs, labeled in name groups.
- C. Store adhesive attachment tape at ambient room temperatures.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.
- D. Do not install signs when ambient temperature is lower than recommended by manufacturer.
- E. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.1 INTERIOR SIGNS

- A. Engraved Signs: Laminated colored plastic; lettering engraved through face to expose core color:
 - 1. Face Color: Color as selected by Architect.
 - 2. Core Color: White
 - 1. Total Thickness: 1/8 inch.
 - 2. Sign Height: 3 inches.
 - 3. Edges: Square

4. Character Font: Helvetica.
 5. Character Case: Upper case.
 6. Text Height. .625" Minimum
 7. Provide Braille on each sign
- C. Graphic Style: Handicapped type.

2.2 ACCESSORIES

- A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 31 00 - Project Management and Coordination: Verification of existing conditions before starting work.

3.2 INSTALLATION

- A. The baseline of the tactile copy shall be mounted between 48" at the lowest point to 60" at the highest point.
- B. Signs shall be mounted to the wall on the latch side of the door. If there is no room on that wall, the sign may be mounted on the nearest adjacent wall.

3.3 SCHEDULES

- A. Provide room signs as scheduled on drawing sheet A500
- B. Individual Helvetica letters, 3 inch high sign plaque, face color selected from manufacturers standard colors, white core color, identifying room name indicated on drawing schedule.
- C. Rest Room Graphic: 8 inches high, "male" and "female" graphic image; located on wall adjacent to room door.

END OF SECTION

SECTION 10 26 00

WALL AND DOOR PROTECTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Corner Guards.
- B. Related Sections:
 - 1. Section 06 10 53 - Miscellaneous Rough Carpentry: Support blocking for wall and corner guard anchors.
 - 2. Section 09 21 16 - Gypsum Board Assemblies: Installation of gypsum board walls.

1.2 PERFORMANCE REQUIREMENTS

- A. Installed Wall Rail Component Assembly: Support vertical live load of 100 lb/lineal ft with deflection not to exceed 1/50 of span between supports.
- B. Installed Component Assembly: Resist lateral force of 75 lbs at any point without damage or permanent set.
- C. Corner Guards: Resist lateral impact force of 100 lbs at any point without damage or permanent set.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.
- C. Samples: Submit two samples illustrating component design, configuration, color and finish.

1.4 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.5 COORDINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions.
- B. Coordinate Work with wall or partition sections for installation of concealed blocking or anchor devices.

PART 2 PRODUCTS

2.1 WALL AND CORNER GUARDS

- A. Manufacturers:
 - 1. The Corner Guard Store
 - 2. C/S Group, Acrovyn

3. Arden Architectural Specialties Inc.
4. InPro Corporation
5. Koroseal Wall Protection Systems, Inc
6. Pawling Corp.
7. Substitutions: Section 01 60 00 - Product Requirements.

2.2 COMPONENTS

- A. Corner Guard: 3.5 inch legs, 1/8 inch radiused corner
 1. Material: Aluminum
 2. Mounting: Surface mounted w/ screws
 3. Finish: Clear Anodized
 4. Model: ACO-8
 5. Corner Angles: verify and special order as required
- B. Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.

2.3 FABRICATION

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.
- C. Form end trim closure by capping and finishing smooth.

2.4 FACTORY FINISHING

- A. Corner Guard: Color as selected.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution: Coordination and project conditions.
- B. Verify rough-in for components are correctly sized and located.

3.2 INSTALLATION

- A. Position corner guard 8 inches above finished floor to 52 inches high.
- B. Install per manufacturer's instructions

3.3 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation from Required Height for Horizontal Rails: ¼ inch.
- C. Maximum Variation from Level or Plane For Visible Length for Horizontal Rails: ¼ inch.

END OF SECTION

SECTION 10 28 00

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes toilet accessories and utility room accessories
- B. Related Sections:
 - 1. Section 06 10 53 - Miscellaneous Rough Carpentry

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - 2. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 3. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
 - 4. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 5. ASTM A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
 - 6. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium
 - 7. ASTM C1036 - Standard Specification for Flat Glass
- B. Federal Specification Unit:
 - 1. FS A-A-3002 - Mirrors, Glass

1.3 DESIGN REQUIREMENTS

- A. Design grab bars and attachments to resist minimum 250 lb concentrated load applied at any point in any direction and forces as required by applicable code

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures
- B. Product Data: Submit data on accessories describing size, finish, details of function, attachment methods

1.5 COORDINATION

- A. Section 01 31 00 - Project Management and Coordination: Coordination and project conditions
- B. Coordinate the Work with placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments

PART 2 - PRODUCTS

2.1 TOILET AND BATH ACCESSORIES

- A. Manufacturers:
 - 1. A&J Washroom Accessories, Inc

2. American Specialties, Inc.
3. Bobrick Washroom Equipment, Inc.
4. Bradley Corporation.
5. Substitutions: Section 01 60 00 - Product Requirements

2.2 COMPONENTS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation
 1. Grind welded joints smooth
 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces
- B. Keys: Furnish two keys for each accessory to Owner
- C. Stainless Steel Sheet: ASTM A666 Type 304
- D. Stainless Steel Tubing: ASTM A269, Type 304 stainless steel
- E. Galvanized Sheet Steel: ASTM A653/A653M, G90 zinc coating
- F. Mirror Glass (Type MR-F): ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality Q1 mirror select; type with copper and silver coating, and organic over-coating
- G. Adhesive: Two component epoxy type, waterproof
- H. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof
- I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate

2.3 TOILET ROOM ACCESSORIES

- A. Toilet Paper Dispenser: Roll-in-reserve type, designed to allow automatic activation of reserve roll when needed, or manual activation by pressing release bar, surface-mounted, Satin-finish stainless steel with stainless steel dispensing mechanism, tumbler lock
 1. Product: 9030 manufactured by American Specialties, Inc
 2. Product: B-2888 manufactured by Bobrick
 3. Product: 5402 manufactured by Bradley
- B. Paper Towel Dispenser: Folded paper type, stainless steel, surface-mounted, with viewing slots on sides as refill indicator and tumbler lock
 1. Capacity: 300 C-fold minimum
 2. Product: 20210 manufactured by American Specialties, Inc
 3. Product: B-262 manufactured by Bobrick
 4. Product: 250-15 manufactured by Bradley
- D. Soap Dispenser: Liquid soap dispenser, wall-mounted, surface, for with stainless steel cover and horizontal stainless steel tank and working parts; push type soap valve, check valve, and window gage refill indicator
 1. Minimum Capacity: 40 ounces
 2. Product: 9343 manufactured by American Specialties, Inc
 3. Product: B-2112 manufactured by Bobrick
 4. Product: 6542 manufactured by Bradley
- E. Mirrors: frameless ¼" polished plate glass
 1. Size: As indicated on Drawings
 2. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and non-absorptive filler material
 3. Product: 0625 manufactured by American Specialties, Inc
 4. Product: B-166 1824 manufactured by Bobrick

5. Product: 7815 manufactured by Bradley
- F. Grab Bars: Stainless steel, 18 Gauge 1-1/4 inches outside diameter, minimum 18 gauge wall Thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar
 1. Length and configuration: As indicated on Drawings

2.4 SHOWER AND TUB ACCESSORIES

- A. Shower Curtain Rod: Stainless steel tube, 1-1/4 inch outside diameter, 22 gauge, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for installation with concealed mounting.
- B. Shower Curtain: Opaque vinyl, 6 gauge thick, matte finish, with antibacterial treatment, flame resistant and stain-resistant fabric.
- C. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, hinges and mechanical fasteners of Type 304 stainless steel, L-shaped, right-hand or left-hand seat.
 1. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of color as selected.
 2. Seat: Teakwood slats secured to supporting frame members with stainless steel screws. Ease edges of each slat.
- D. Wall-Mounted Soap Dish: Normal duty, seamless stainless steel, surface-mounted with drain holes, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.
 1. Product: 0720-Z manufactured by American Specialties, Inc.
 2. Product: B-680 manufactured by Bobrick.
 3. Product: 9014 manufactured by Bradley.

2.5 UTILITY ROOM ACCESSORIES

- A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets
 1. Drying rod: Stainless steel, 1/4 inch diameter
 2. Hooks: 3, 0.06 inch stainless steel rag hooks at shelf front
 3. Mop/broom holders: spring-loaded rubber cam holders at shelf front
 4. Length: As indicated on Drawings
 5. Product: 1315 series manufactured by American Specialties, Inc
 6. Product: B-223 series manufactured by Bobrick
 7. Product: 998 series manufactured by Bradley

2.6 FACTORY FINISHING

- A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted
- B. Chrome/Nickel Plating: ASTM B456, Type SC 2, satin finish , unless otherwise noted
- C. Baked Enamel: Pre-treat to clean condition, apply one coat primer and minimum two coats electrostatic baked enamel
- D. Galvanizing ASTM A123/A123M; hot dip galvanize after fabrication
- E. Galvanizing for Nuts, Bolts and Washers: ASTM A153/A153M

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution
- B. Verify exact location of accessories for installation

C. Verify field measurements are as indicated on product data

3.2 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation

B. Provide templates and rough-in measurements as required

3.3 INSTALLATION

A. Install plumb and level, securely and rigidly anchored to substrate

B. Mounting Heights and Locations: As indicated on Drawings or required by accessibility regulations

END OF SECTION

SECTION 10 44 00

FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes fire extinguishers and fire extinguisher cabinets.
- B. Related Sections:
 - 1. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood blocking and shims.
 - 2. Section 06 10 00 - Rough Carpentry: Roughed-in wall openings; Execution requirements for placement of rough-in frame for cabinets.

1.2 REFERENCES

- A. National Fire Protection Association:
 - 1. NFPA 10 - Standard for Portable Fire Extinguishers.
- B. Underwriters Laboratories Inc.:
 - 1. UL - Fire Protection Equipment Directory.

1.3 PERFORMANCE REQUIREMENTS

- A. Conform to NFPA 10 applicable code.
- B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for purpose specified and indicated.
- C. Provide fire extinguisher cabinets classified and labeled by Underwriters Laboratories Inc. for purpose specified and indicated.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, wall bracket mounted measurements, location, and fire ratings, .
- C. Product Data: Submit extinguisher operational features, color and finish, and anchorage details.
- D. Manufacturer's Installation Instructions: Submit special criteria and wall opening coordination requirements.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures: Closeout submittals.
- B. Operation and Maintenance Data: Submit test, refill or recharge schedules and re-certification requirements.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.
- B. Do not install extinguishers when ambient temperature are capable of freezing extinguisher ingredients.

PART 2 PRODUCTS

2.1 FIRE EXTINGUISHERS

- A. Dry Chemical Type: Cast steel tank, with pressure gage; Class A, B, C, Size 10.
- B. Extinguisher Finish: Steel, enamel to red color.

2.2 ACCESSORIES

- A. Extinguisher Brackets: galvanized finish.
- B. Fire extinguisher wall hanger.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 73 00 - Execution

3.2 INSTALLATION

- A. Install wall brackets, maximum 48 inches from finished floor to top of extinguisher handle.
- B. Secure rigidly in place.
- C. Place extinguishers in cabinets.

3.3 SCHEDULES

- A. Fire Extinguisher location shown on the Drawings.

END OF DIVISION