SANTA MARIA COMMUNITY SERVICES
NEW OFFICE BUILDING

1048 Considine Avenue
Cincinnati, Ohio 45205

PROJECT MANUAL

February 2026

General Contractor: Model Construction LLC
Architect: ATA Architects
Structural Engineer: GOP Unlimited Structural Engineers
Civil Engineer: Abercrombie & Associates, Inc.
MEP Engineer: RTM Engineering Consultants

PROJECT MANUAL CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

SPECIFICATIONS

GENERAL REQUIREMENTS

FACILITY CONSTRUCTION

05 3113 Steel Floor Decking
05 3123 Steel Roof Decking
05 4000 Cold Formed Metal Framing
05 5000 Metal Fabrications
05 5100 Metal Stairs
05 5133 Metal Ladders
05 5200 Metal Railings

Division 06 – Wood, Plastics, and Composites
06 0573 Wood Treatment
06 1050 Miscellaneous Rough Carpentry
06 1600 Sheathing
06 2000 Finish Carpentry
06 6116 Solid Surfacing Fabrications

Division 07 – Thermal and Moisture Protection
07 1400 Fluid Applied Waterproofing
07 2100 Thermal Insulation
07 2216 Roof Insulation
07 2726 Fluid Applied Membrane Air Barriers
07 4619 Steel Siding
07 4646 Fiber-Cement Siding
07 5000 Membrane Roofing
07 6100 Sheet Metal Roofing
07 7100 Roof Specialties
07 7233 Roof Hatches
07 7600 Roof Pavers
07 8400 Firestopping
07 9200 Joint Sealants

Division 08 – Openings
08 1213 Hollow Metal Frames
08 1400 Wood Doors
08 3613 Sectional Doors
08 4113 Aluminum Entrances and Storefronts
08 7100 Door Hardware
08 8000 Glazing

Division 09 – Finishes
09 2210 Metal Support Systems
09 2900 Gypsum Board
09 3013 Ceramic Tiling
09 5100 Acoustical Ceilings
09 6500 Resilient Flooring

09 6800	Carpeting
09 8100	Acoustic Insulation
09 9000	Painting and Coating
09 9623	Graffiti-Resistant Coatings

Division 10 – Specialties

10 1402	Interior Signage
10 1453	Traffic Signage
10 2239	Folding Panel Partitions
10 2800	Toilet and Bath Accessories
10 4400	Fire Protection Specialties

Division 11 – Equipment

11 3100	Appliances

Division 12 – Furnishings

12 2400	Window Shades
12 3000	Casework

Division 14 – Conveying Equipment

14 2023	Passenger Elevators

FACILITY SERVICES

Division 21 – Fire Suppression

21 0500	Common Work Results for Fire Suppression
21 0523	General-Duty Valves for Water-Based Fire-Suppression Piping
21 0553	Identification for Fire Suppression Piping and Equipment
21 1100	Facility Fire-Suppression Water-Service Piping
21 1300	Fire-Suppression Sprinkler Systems

Division 22 – Plumbing

22 0517	Sleeves and Sleeve Seals for Plumbing Piping
22 0519	Meters and Gauges for Plumbing Piping
22 0523	General-Duty Valves for Plumbing Piping
22 0529	Hangers and Supports for Plumbing Piping and Equipment
22 0553	Identification for Plumbing Piping and Equipment
22 0719	Plumbing Piping Insulation
22 0719.11	Under-Lavatory Pipe and Supply Covers
22 1005	Plumbing Piping
22 1006	Plumbing Piping Specialties
22 1429	Sump Pumps
22 3000	Plumbing Equipment
22 4000	Plumbing Fixtures

Division 23 – Heating, Ventilating, and Air Conditioning (HVAC)

23 0513	Common Motor Requirements for HVAC Equipment
23 0517	Sleeves and Sleeve Seals for HVAC Piping
23 0519	Meters and Gauges for HVAC Piping
23 0523	General-Duty Valves for HVAC Piping
23 0529	Hangers and Supports for HVAC Piping and Equipment
23 0553	Identification for HVAC Piping and Equipment
23 0593	Testing, Adjusting, and Balancing for HVAC
23 0713	Duct Insulation
23 0716	HVAC Equipment Insulation
23 0719	HVAC Piping Insulation
23 0800	Commissioning of HVAC
23 0923	Direct-Digital Control Systems for HVAC
23 0934	Variable-Frequency Motor Controllers for HVAC
23 1123	Facility Natural-Gas Piping
23 2113	Hydronic Piping
23 2114	Hydronic Specialties
23 2123	Hydronic Pumps
23 3100	HVAC Ducts and Casings
23 3300	Air Duct Accessories
23 3600	Air Terminal Units
23 3700	Air Outlets and Inlets
23 5100	Breechings, Chimneys, and Stacks
23 5233	Water-Tube Boilers
23 7223	Packaged Air-to-Air Energy Recovery Units
23 7413	Packaged Outdoor Central-Station Air-Handling Units

Division 26 – Electrical

26 0505	Selective Demolition for Electrical
26 0519	Low-Voltage Electrical Power Conductors and Cables
26 0526	Grounding and Bonding for Electrical Systems
26 0529	Hangers and Supports for Electrical Systems
26 0533.13	Conduit for Electrical Systems
26 0533.16	Boxes for Electrical Systems
26 0533.23	Surface Raceways for Electrical Systems
26 0553	Identification for Electrical Systems
26 0573	Power System Studies
26 0800	Commissioning of Electrical Systems
26 2100	Low-Voltage Electrical Service Entrance
26 2200	Low-Voltage Transformers
26 2416	Panelboards
26 2726	Wiring Devices
26 2813	Fuses
26 2816.13	Enclosed Circuit Breakers

END OF CONTENTS

SECTION 01 1117 – OWNER-SUPPLIED PRODUCTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Owner-supplied Products.

PART 2 PRODUCTS

2.01 OWNER-SUPPLIED PRODUCTS:

A. Furnish and install all required structural framing, backing, and support for the following items, which will be furnished and installed under separate contract:
   1. Section 10 1402 – Interior Signage.

B. Furnish and install conduit raceways and outlets for the following systems. System components, wiring, and final connections will be furnished and installed under separate contract:
   1. Communications and electronic safety/security systems shown on T-series drawings.

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 2300 – ALTERNATES

PART 1 GENERAL

1.01 ALTERNATES:

A. The Owner will select or reject Alternates as it determines is in its best interest. Owner reserves the right to select, in any order, any or all Alternates, or to reject all Alternates. Accepted Alternates will be identified in Owner-Contractor Agreement.

B. During the progress of the Work, the Owner reserves the right to reinstate any Alternate not initially included in the Contract at the price bid by the Contractor provided that such action is taken in sufficient time so as not to delay the progress of the Work or cause the Contractor additional expense.

C. Coordinate related work and modify or adjust surrounding work as required to ensure that work affected by each accepted Alternate is complete and fully integrated into the project.

D. Include as part of each Alternate all miscellaneous devices, accessories, appurtenances, and similar items incidental to or required for a complete installation, whether or not mentioned as part of the Alternate.

1.02 SCHEDULE OF ALTERNATES:

A. Alternate 1: Insulating Wall Sheathing
   1. Base Bid Item: Wall sheathing shall be 5/8 inch plywood, with separate 1 inch extruded polystyrene board insulation; refer to Sections 06 1600 and 07 2100.
   2. Alternate Item: Wall sheathing shall be insulating wall sheathing panel with 5/8 inch plywood bonded to 1 inch polyisocyanurate board insulation; refer to Section 06 1600.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3100 – PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Project coordination.
   2. Requests for interpretation.
   3. Facility services coordination.
   4. Project meetings.

1.02 PROJECT COORDINATION:

A. The Contractor shall assign one person who will be on site full-time and who will have authority to speak and act on behalf of the Contractor. This person shall supervise and direct the work using their best skill and attention, and shall coordinate all trades and Subcontractors and provide adequate labor, equipment and materials as needed.
   1. Communications to the Contractor's superintendent shall be as binding as if given directly to the Contractor.
   2. Upon Notice to Proceed, Contractor shall notify the Owner of the proposed superintendent, and if requested by the Owner shall also submit a summary of qualifications and experience, including references.
   3. Contractor shall not change their superintendent without prior written notice to the Owner, including justification for the change and identification and qualifications of the proposed replacement.
   4. Owner reserves the right to reject proposed superintendents within 30 days, in which case Contractor shall provide an acceptable replacement without adjustment of Contract Sum or Contract Time.

B. Maintain a constant check on the progress of the Project; coordinate and sequence work with that of others to facilitate progress of the Project; provide reasonable advance notification to all parties concerned of any special provisions regarding the placing, setting, or preparation of work that will affect the work of others; afford others every reasonable opportunity for installation and execution of their work and storage of their materials.

C. Alterations to work already placed and necessitated by failure to properly coordinate work shall be accomplished at the expense of the negligent party.

D. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

E. Before installing any work, and before purchasing any equipment, carefully check Contract Documents for conflicts or lack of coordination between or among required

Work, Contract Documents, and job conditions; immediately report same to Architect in writing.

1. In the event of failure to bring such lack of coordination between or among Contract Documents, work of other trades, and job conditions to Architect's attention in writing before work is performed or before equipment is purchased, resulting conflicts shall be corrected as directed by the Architect, without adjustment of Contract Sum or Contract Time.

F. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion.

G. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.03 REQUESTS FOR INTERPRETATION (RFI):

A. In the event the Contractor determines that some portion of the Contract Documents requires clarification or interpretation, submit a Request for Interpretation in writing on forms approved by the Architect.

B. Each RFI shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed, the date by which a response is requested, and shall include the Contractor's interpretation or understanding of the contract requirements along with reasons why such an understanding was reached.

C. RFIs shall be submitted by the Prime Contractor only and shall not be used for routine project communication, to transmit submittals, to request substitutions, or for other correspondence. Documents which are not RFIs will be returned for resubmittal on the proper form.

D. Minor detail items related to shop drawing submittals shall be highlighted on the shop drawings and do not require an RFI.

E. Submit each RFI in sufficient time to avoid delaying the project, allowing minimum one week for Architect's response. If the Architect determines that a longer time is necessary to provide an adequate response, the Architect will advise of the anticipated response time within one week of receipt of the RFI. Adjustment of Contract Time will not be granted due to the Architect's response time.

F. Responses to RFIs shall be considered interpretations and clarifications of the contract requirements and do not change the Contract Documents. If the Contractor believes that a response constitutes a change to the Contract Documents, Contractor shall promptly give written notice.

G. In the event of an excessive number of RFIs where the requested information is available from the Contract Documents, field observations, industry standards, manufacturer's instructions, or prior Project correspondence or documentation, the Owner shall be entitled to deduct from the Contract Sum all reasonable costs charged

by the Architect to the Owner for additional services required for the processing of such RFIs.

1.04 FACILITY SERVICES COORDINATION:

A. Contract Documents: Facility Services work (Fire Suppression, Plumbing, HVAC, Electrical, Communications, and Electronic Safety and Security) may be shown throughout the Drawings. Information required for proper coordination of the work may be contained in specifications of other trades. Become thoroughly familiar with all documents referenced in the Project Manual Contents and List of Drawings and coordinate the Work with all provisions thereof.

B. System Layout: Facility Services drawings are diagrammatic and are intended to show the approximate locations of components. Field verify dimensions shown on the Drawings. Do not scale drawings to obtain exact dimensions.
   1. Coordinate space requirements and installation of work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
   2. The exact location of items not located by dimensions on the Drawings shall be determined in the field with consideration given to appearance, clearances, and potential conflicts, and is subject to approval by the Architect.
   3. Before beginning installation, verify required clearances for the erection of beams, columns, walls, casework, and other structural and architectural work shown on the Drawings. If any work is installed and it later develops that the architectural design cannot be followed, make such changes as the Architect may direct to facilitate completion of the architectural work in accordance with the Contract Documents.
   4. Report actual and potential interferences and conflicts among Facility Services work and the work of other trades to the Architect as soon as they are discovered. The Architect's decision shall be final in regard to the rearrangement of conflicting work, regardless of which was first installed.
   5. Field verify exact locations of apparatus, fixtures, and equipment supplied by the Owner and others, and install the work accordingly. If the installer fails to ascertain such locations before proceeding with the work, the work shall be changed at the installer's expense when so ordered.
   6. Throughout the course of the work, up to the time of roughing-in and installation, minor changes and adjustments to the installation may be requested by the Architect. Make such adjustments without modification to the Contract Sum or Contract Time, where such adjustments are necessary to facilitate proper installation and operation within the intent of the Contract Documents. This does not include work already completed.
   7. Position fixtures, equipment, devices, switches, outlets, and related components, to avoid interferences with and to assure proper coordination with work of other trades, partitions, walls, cabinets, counters, wall, floor and ceiling patterns, and

architectural features. Coordinate recessed devices and fixtures with wall, floor and ceiling patterns.

8. Equipment and piping shall not be installed or run above electrical switchgear or panelboards, nor in or above the access space in the immediate vicinity of the electrical switchgear or panelboards, in accordance with the applicable electrical code. Failure to notify the Architect of conflict and to provide adequate coordination will result in costs incurred at the expense of the negligent party.
9. Maintain service access clearances to equipment as indicated on submittals. Verify that filter replacement, scheduled maintenance, and repair parts replacement can be performed without obstruction by other systems or components.
10. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

C. Utility Coordination: Contact each utility company providing service to the project and determine or verify their requirements.
   1. Make all arrangements with each utility company and pay all service charges associated with temporary or new services or modifications to existing services.
   2. Arrange utility tie-ins with local utility company and other involved parties for minimum interruption of service.

D. Equipment Coordination: Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
   1. Prior to ordering electrically operated items, verify requirements so that they will operate on the voltage, amperage, and phase provided for them.
   2. Prior to ordering gas fired items, verify requirements so that they will operate on the type of gas and available pressure provided for them.
   3. Any item delivered to the job which will not operate on the current or fuel provided will be rejected or the Contractor will stand the expense of changing the wiring or piping to accommodate the equipment.
   4. Verify equipment can be installed and removed through permanent building openings. Where necessary, provide modular components which can be disassembled and reassembled. Bring exceptions to the attention of the Architect and provide lintels, knockout panels, and other construction as directed to facilitate installation and future removal of equipment.

E. Structural Supports: Except as otherwise noted, furnish the main supporting structure and provide floor, wall, and roof openings, as shown on the structural Drawings.
   1. Coordinate requirements for floor, wall, and roof openings, including openings not shown on the Drawings, before the structure is erected. Perform cutting and patching, where required, in accordance with Section 01 7000.
   2. Where equipment is supported by the building structure, the structural Drawings indicate supports and other design considerations which are based on the use of the scheduled equipment. Where products of another listed manufacturer are supplied,

or where substitutions are approved, coordinate dimensions, clearances, structural supports, and other conditions as required for proper installation.

3. Provide supplemental framing, rods, supports, and hangers required to install or mount equipment indicated, and as necessary to provide a complete working system. Do not support equipment, piping, conduit, or any other components from metal deck, or from open web framing members at any locations other than panel points.
4. Provide cross bracing for suspended equipment to prevent swaying.

F. Access Panels: Where valves, traps, water hammer arresters, dampers, or other specialties are concealed in construction or behind a wall or ceiling surface, furnish and install an access panel of adequate size to permit adjustment or service of concealed device.

1. Access panels shall be of a design suitable for installation in the material forming the finished surface in which each is mounted. Where doors are installed in fire-rated construction, they shall have the appropriate required rating.
2. Each access panel in masonry or gypsum board surfaces shall have a flush metal frame and flush hinged steel door with flush screwdriver-operated latch.
3. Coordinate access panel locations with the work of other trades. Wherever practicable, group components requiring access to be accessible from a single panel and eliminate as many access panels as possible.
4. Where ceiling systems with removable panels are used, access doors need not be supplied. Indicate the presence and type of concealed components with a color coded sticker on the ceiling grid.

G. Identification and Labeling: Where room numbers are used for identification of Facility Services components, utilize the Owner's final room names and numbers, which may vary from room names and numbers on the Drawings. Coordinate with interior signage and other permanent room identification.

1.05 PROJECT MEETINGS:

A. Preconstruction Meeting: Architect will schedule a meeting after Notice of Award.

1. Attendance Required: Owner, Architect, and Contractor.
2. Agenda:
   a. Execution of Owner-Contractor Agreement.
   b. Submission of executed bonds and insurance certificates.
   c. Distribution of Contract Documents.
   d. Submission of list of Subcontractors, list of Products, schedule of values, and project schedule.
   e. Designation of personnel representing the parties in Contract, and the Architect.
   f. Procedures and processing of field decisions, submittals, substitutions, applications for payment, change procedures, and contract closeout procedures.
   g. Use of premises by Owner and Contractor.
   h. Construction facilities, controls, and temporary utilities provided by Owner.

i. Security and housekeeping procedures.
j. Procedures for maintaining record documents.
k. Scheduling.

3. Record minutes and distribute copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

B. Progress Meetings: Schedule and administer meetings throughout progress of the Work at maximum monthly intervals, scheduled to coordinate with preparation of payment requests. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings. Notify parties, including Architect, at least four days in advance.

1. Attendance Required: Representatives of Contractor, major Subcontractors and suppliers, as appropriate to agenda topics for each meeting.

2. Agenda:
   a. Review minutes of previous meetings.
   b. Review of Work progress.
   c. Field observations, problems, and decisions.
   d. Identification of problems which impede planned progress.
   e. Review of submittals schedule and status of submittals.
   f. Review of off-site fabrication and delivery schedules.
   g. Maintenance of progress schedule.
   h. Corrective measures to regain projected schedules.
   i. Planned progress during succeeding work period.
   j. Coordination of projected progress.
   k. Maintenance of quality and work standards.
   l. Effect of proposed changes on progress schedule and coordination.
   m. Other business relating to Work.

3. Record minutes and distribute copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

C. Preinstallation Meetings: When required in individual specification sections, convene a preinstallation meeting prior to commencing work of the section.

1. Require attendance of parties directly affecting, or affected by, work of the specific section.

2. Notify Architect four days in advance of meeting date.

3. Prepare agenda and preside at meeting:
   a. Review conditions of installation, preparation and installation procedures.
   b. Review coordination with related work.

4. Record minutes and distribute copies within two days after meeting to Architect, Owner, participants, and those affected by decisions made.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3200 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Construction progress documentation.

1.02 CONSTRUCTION PROGRESS DOCUMENTATION:

A. Submit initial construction schedule within 15 days after date of Notice of Award.

B. Revise and resubmit as required.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

D. Submit a horizontal bar chart with separate line for each section of Work, identifying first work day of each week. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, critical path, float dates, and duration.

E. Indicate estimated percentage of completion for each item of Work at each submission.

F. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.

G. Schedule shall begin with Notice to Proceed and conclude with the date of final completion of the project. Float or slack time within the construction schedule is not for the exclusive use or benefit of either the Owner or Contractor but is a jointly owned, expiring project resource available to both parties as needed to meet contract milestones and the contract completion date.

H. No time extensions will be granted nor delay damages paid until a delay occurs that impacts the project's critical path, consumes all available float or contingency time, and extends the work beyond the contract completion date.

   1. Delays arising from multiple causes which may have concurrent or interrelated effects on the progress of the Work shall be combined into a single unit for the purposes of determining the appropriate time extension, if any.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 3300 – SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. General requirements for submittals.
   2. List of subcontractors and products.
   3. Shop drawings, product data and samples.
   4. Manufacturer's installation instructions and certificates.

B. Related Requirements:
   1. Section 01 6000 – Product Requirements: Submittals for substitutions.
   2. Section 01 7700 – Closeout Requirements: Contract warranties, operation and maintenance data, and closeout submittals.

1.02 GENERAL REQUIREMENTS FOR SUBMITTALS:

A. Electronic Submittals: Submittals (except samples, color selectors, and submittals requiring certification by a registered professional) shall be submitted in electronic format.
   1. Only PDF files will be accepted, unless otherwise approved in advance.
   2. For submittals to be reviewed by Architect's consultants, confirm in advance that electronic submittals will be accepted.
   3. For submittals to be distributed to governing authorities, electronic submittals shall be used for review by Architect and Architect's consultants. If requested, provide the number of paper submittals required for use by authorities having jurisdiction.
   4. Submittals shall be accompanied by a statement from the submitter indicating approval.
   5. Color selections will not be made from electronic submittals. Hard copy color selectors or samples will be required.
   6. Submittals will be returned in electronic format. Architect's notations may be included in the submittal file or in a separate document, and shall be distributed with all copies of the reviewed submittals.

B. Paper Submittals:
   1. Transmit each submittal with Transmittal Letter, AIA Form G810 or equivalent. Number the transmittal form with the Specification Section number. Revise submittals with original number and a sequential alphabetic suffix.
   2. Apply Contractor's stamp, signed or initialed, indicating approval.

3. Submit three copies, unless individual specification sections require a greater number of copies. One copy will be returned to the Contractor. Additional copies will not be processed or returned.
   a. For structural materials and fabricated components, submit one additional copy which will be retained by Structural Consultant.
   b. For Division 21 through 28 submittals, submit one additional copy which will be retained by MEP Consultant.
   c. For Division 31 through 33 submittals, submit one additional copy which will be retained by Civil Consultant.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, date, and specification section number, as appropriate.

D. Use standard letter, tabloid, and architectural page sizes only. Provide space on first page for Architect and professional subconsultant review stamps, minimum 1½ x 3 inch each space.

E. Where items are identified in the Contract Documents by number, letter or similar mark, include the same identification on submittals. Arrange items within the submittal in the same sequence as the identification in the Contract Documents, unless another sequence is approved in advance by the Architect.

F. By approving and submitting submittals, the Contractor represents that he has reviewed and verified field dimensions, quantities, adjacent construction Work, field construction criteria, materials, catalog numbers, specified design requirements and performance requirements, and similar data, and coordinated information in accordance with the requirements of the Work and Contract Documents.

G. Submittals stamped "For Approval Only" or "Not For Construction" will not be accepted.

H. Where individual specification sections require submittals to be prepared under the supervision of a Professional Engineer or other registered professional, apply the registered professional's seal and signature to such submittals.

I. All responsibility for the submittal shall be that of the submitter. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any submittal.

J. Identify deviations from Contract Documents, and Product or system limitations which may be detrimental to successful performance of the completed Work.

K. Correct returned submittals marked "Revise and Resubmit" or "Not Approved"; identify all changes made since previous submission. Review of revised submittals will be limited to previously noted items, unless other changes are specifically called out. Direct specific attention in writing on resubmittals to revisions other than the corrections requested on previous submissions.

L. Distribute copies of reviewed submittals as appropriate, including distribution to separate Contractors whose work connects to or interfaces with the submittal item. Instruct parties to promptly report any inability to comply with provisions.

M. Submittals not requested will not be acknowledged or processed.

N. Submittals for Review: Architect's review of submittals is limited to conformance with the design concept and to compliance with requirements of the Contract Documents.
   1. Architect's review of submittals is a gratuitous assistance, and the Architect's action does not relieve the submitter of responsibility for deviations from the requirements of the Contract Documents unless the Architect has been informed in writing of the deviation at the time of submission and has given written approval to the specific deviation, nor shall the Architect's action relieve the submitter from responsibility for errors or omissions in the submittals. Such errors, omissions, or deviations shall be made good by the submitter, irrespective of the receipt, checking, review, or approval of submittals by the Architect, and even though the Work is performed in accordance with approved submittals.
   2. Contractor retains all responsibility for quantities, field dimensions, fabrication, installation, construction means, methods, techniques, sequences, procedures, safety precautions and programs, and coordination with Work by others. The content of the submittal and wording of the Contractor's review stamp shall not serve to limit responsibility for the above items.
   3. For submittals requiring approval by governing authorities, Architect's approval of the submittal is contingent upon and subject to approval by authorities having jurisdiction.
   4. Architect's notations and remarks added to submittals are to ensure compliance with Contract Documents and do not constitute, imply or require a contract modification.
   5. The Architect's review of an individual item does not indicate review of an assembly in which the item is included.

O. Submittals for Information: The following categories of submittals, and additional submittals identified in individual specification sections, will not be approved by the Architect or returned to the Contractor, but may be retained for record purposes. When requested by Contractor, Architect will acknowledge receipt. Submittals may be rejected for not complying with requirements.
   1. Manufacturer certificates, material certificates, material safety data sheets, and material test reports. Do not submit Safety Data Sheets unless specifically requested.
   2. Manufacturer's guide specifications.
   3. Installer certificates, welding certificates, and installer qualification data.
   4. Work plans, waste management plans, storm water pollution prevention plans, and similar representations of construction means, methods, sequences, and procedures.
   5. Insurance certificates and bonds.

6. Test reports.
7. Environmental product declarations.
8. Engineering calculations.
9. Installation instructions and maintenance recommendations.
10. Manufacturer's field reports.
11. Construction photographs.

1.03 SUBMITTAL SCHEDULE:

A. Prepare a complete schedule of submittals within 10 days of Notice to Proceed.
   1. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Construction Schedule.
   2. Organize the schedule by Project Manual Contents. Provide the following information for each specification Section:
      a. Scheduled date for the first submittal.
      b. Name of Subcontractor.
      c. For each submittal for review, including revised submittals, allow 15 working days excluding delivery time.
   3. Allow time for review by Architect and Architect's consultants, including delivery time. Allow time for one resubmittal after the initial submittal without delaying the Construction Schedule.
   4. Review of submittals and resubmittals will be prioritized by date indicated on the Submittal Schedule.
   5. Alterations or additional work required because of Contractor's failure to make timely submittals shall be corrected without additions to the Contract Sum.

B. Prioritize the submittal of critical schedule items, long lead items, items requiring coordination between trades, and submittals that may affect final plan approval. These items include, but are not limited to, the following:
   1. Section 05 1200 – Structural Steel Framing.
   2. Section 05 2100 – Steel Joist Framing.
   3. Section 05 4000 – Cold Formed Metal Framing.
   4. Section 07 8400 – Firestopping.
   5. Section 10 2239 – Folding Panel Partitions.
   6. Section 14 2023 – Passenger Elevators.
   7. Section 21 1300 – Fire Suppression Sprinkler Systems.
   8. Section 23 3813 – Commercial Kitchen Hoods.
   9. Section 26 1219 – Pad Mounted Transformers.
   10. Section 28 4600 – Fire Detection and Alarm.

1.04 LIST OF SUBCONTRACTORS:

A. Within 15 days after date of Notice to Proceed, submit list of Subcontractors proposed for use, with postal addresses, email addresses, and telephone numbers. Indicate all sections of Work to be performed by each Subcontractor.

B. Sections of Work for which a Subcontractor is not listed will be construed to be done by the Prime Contractor.

C. Notify the Architect in writing in advance of any proposed changes to the list of Subcontractors.

1.05 LIST OF PRODUCTS:

A. Within 15 days after date of Notice to Proceed, submit list of major Products proposed for use, with name of manufacturer, trade name, and model number of each Product.

B. For Products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

C. Notify the Architect in writing in advance of any proposed changes to the list of Products.

1.06 SHOP DRAWINGS:

A. Prepare neat, legible, accurate drawings at scales adequate to fully illustrate all pertinent data. Where applicable, include plan, elevation, and section views complete with dimensions, notes, and other data sufficient to demonstrate compliance with requirements of Contract Documents and to show relationships and connections to adjacent materials and related work by others.

B. Electronic Base Drawings: Contractors may obtain drawings from the Architect in PDF format for use in preparing shop drawings. Drawings will remain the property of the Architect, and will be subject to a License Agreement which must be completed prior to distribution of the Drawings.
   1. Drawings prepared by Architect's consultants may or may not be available. Contact each consultant for availability and pricing.
   2. The Architect makes no representation regarding the accuracy or completeness of electronic drawings. Addenda, Change Orders, and other revisions may or may not be included. Electronic drawings are not contract documents, and in case of discrepancy or conflict, the contract documents shall govern.
   3. Use of electronic drawings does not relieve the user of duty to check, confirm, and coordinate all dimensions and details, field verify dimensions and conditions, and coordinate the work with that of others.

C. Submit for review. After review, produce copies and distribute as required for fabrication and construction, and for record documents purposes as described in Section 01 7700.

D. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Structural Calculations: State specific loads on which calculations are based. References to code requirements without listing specific loads are not sufficient.

F. Wiring Diagrams: When specified in individual specification sections, submit detailed point-to-point wiring diagrams indicating each component, locations and quantities, and interconnecting wiring between components. Manufacturer's generic system layouts are not normally sufficient without modification to indicate specific Project requirements.

1.07 PRODUCT DATA:

A. Identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

B. Submit for review. After review, distribute as required for fabrication and construction, and for record documents purposes as described in Section 01 7700.

C. Indicate electrical characteristics, including voltage, amperage, and phase.

D. Indicate special utility characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. For pipe system fittings, submit one page with description of fitting type. Do not submit multiple pages with details of each component.

F. For motors, indicate certified test data, horsepower, power factor rating, efficiency rating, watts, and RPM.

1.08 SAMPLES:

A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work so that adjacent or coordinating materials may be reviewed together.

B. Submit samples of the precise article proposed to be furnished.

C. Submit samples whenever a choice of color or pattern is available in a specified material or Product. Include the full range of manufacturer's standard colors, textures, and patterns for selection.

D. Include identification on each sample, with full Project information.

E. Submit the number of samples specified in individual specification sections, or two samples where not otherwise specified; one of which may be retained by Architect.

F. Reviewed samples which may be used in the Work are indicated in individual specification sections.

1.09 MANUFACTURER'S INSTALLATION INSTRUCTIONS:

A. Maintain on site one printed or electronic copy of manufacturer's instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing.

B. When specified in individual specification sections, or upon request, submit instructions to Architect for information.

C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.10 MANUFACTURER CERTIFICATES:

A. When specified in individual specification sections, or upon request, submit certification by manufacturer to Architect.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4000 – QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. References.
   2. Quality assurance and control.

B. Related Requirements:
   1. Section 01 3300 – Submittal Procedures: Submittals of manufacturer's instructions and certificates.
   2. Section 01 6000 – Product Requirements: Requirements for material and product quality.

1.02 REFERENCES:

A. Standards: Ensure products and installation are in conformance with applicable recommendations and requirements of the following:
   1. Factory Mutual Engineering.
   2. Owner's insurance underwriter.
   3. Americans with Disabilities Act (ADA) Standards for Accessible Design.
   4. National Electrical Manufacturers Association (NEMA).
   5. National Fire Protection Association (NFPA).
   6. Occupational Safety and Health Administration (OSHA).
   7. Underwriters Laboratories (UL).
   8. Local utility companies.
   9. Products requiring electrical connection shall be listed and classified by Underwriters Laboratories, Inc., or other testing firm acceptable to the authority having jurisdiction, as suitable for the purpose specified and indicated.

B. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except where more rigid requirements are indicated in the Contract Documents or are required by applicable codes.

C. Conform to edition of standard current on date of Contract Documents, except where a specific edition is established by code.

D. Obtain copies of standards where required by product specification sections.

E. Submit one copy of any referenced standard when requested by Architect.

F. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.03 QUALITY ASSURANCE AND CONTROL:

A. General Requirements:
   1. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
   2. Comply with manufacturer's instructions, including each step in sequence.
   3. If manufacturer's instructions conflict with Contract Documents, request clarification from Architect before proceeding.
   4. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
   5. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement. Provide temporary bracing as required to maintain stability of partially installed work until completion of installation.
   6. Coordinate with Owner for procedures to mitigate risk of infectious diseases according to current regulatory requirements, and recommendations of the Centers for Disease Control and Prevention.

B. Personnel:
   1. Perform work by persons qualified to produce workmanship of specified quality.
   2. Owner reserves the right to require criminal background checks for any or all personnel on site. Owner will pay the cost of background checks. Based on the results of background checks, the Owner may direct the removal of such personnel, or place conditions on their on-site activities, in the Owner's sole discretion.
   3. Owner may direct the removal and replacement of personnel for the following:
      a. Consistently poor workmanship or production of low quality work.
      b. Failure to actively cooperate with the Owner, Architect, or other Contractors in the construction effort.
      c. Theft, vandalism or fraudulent acts.
      d. Dangerous or unsafe practices.
      e. Use of alcohol or drugs; possession or sale of illegal substance of any kind.
      f. Any activity in, on, or about the premises, or in connection with the work, that violates any ordinance, statute, or other regulation of any governmental body having jurisdiction over the premises.
   4. Upon receipt of a written directive from the Owner requiring removal of an employee for one of the above causes, immediately remove the employee from the Project. The removal or replacement of an employee for the above causes shall not be cause for additional compensation. Any such dismissed worker shall not be reemployed in any other capacity for work on the Project.

C. Tolerances:
   1. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.
   2. Comply with manufacturer's tolerances. Should manufacturer's tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

3. Adjust Products to appropriate dimensions; position before securing Products in place.

D. Manufacturers' Field Services and Reports:
1. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, adjustment and balancing of equipment, as applicable, and to initiate instructions when necessary.
2. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
3. Submit report in duplicate within 30 days of observation to Architect for information.

E. Mockups:
1. When specified in individual specification sections, construct full-size representations of construction, materials, and finishes to demonstrate aesthetic effects, quality of workmanship, and coordination of elements.
2. Build mockups in locations and size indicated, or if not indicated, as directed by Architect.
3. Notify Architect minimum 7 days in advance of scheduled date for construction of mockup.
4. Construct mockup using workers to be employed for the construction illustrated by the mockup, and under the direction of the supervisory personnel who will direct the work.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's approval of mockups before starting fabrication or construction of the work, allowing minimum 7 days for initial review and each subsequent review of each mockup.
7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4100 – REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Codes and regulations.
   2. Taxes.
   3. Permits and Fees.

1.02 GENERAL REQUIREMENTS:

A. Become familiar with all regulatory requirements which may affect the Work.

B. Comply with regulatory requirements in effect on the date for receiving bids, or on date of Contract Documents if there were no bids, except where a specific date is established.

C. In the event of conflict between regulatory requirements and the Contract Documents, comply with regulatory requirements, but not before referring the points in question to the Architect for approval.

1.03 CODES AND REGULATIONS:

A. Perform Work in conformance with the codes listed in this Section, and with the requirements of federal, state and local authorities having jurisdiction.
   1. Building Code: Ohio Building Code.
   2. Accessibility Code: ICC A117.1.
   3. Elevator Code: Ohio Elevator Code.
   4. Plumbing Code: Ohio Plumbing Code.
   5. Mechanical Code: Ohio Mechanical Code.
   6. Electrical Code: National Electrical Code, NFPA 70.

1.04 TAXES:

A. Bidders and Contractors shall be responsible for informing themselves of tax laws, requirements, regulations, and interpretations as they apply to this project.

B. Tax exempt Owners will provide sales tax exemption certificates on request. Building materials purchased for incorporation into the improvements will be exempt from the state sales and use taxes, if the Contractor provides a properly completed and executed sales tax exemption certificate to the vendors or Suppliers at the time of the acquisition of the materials.
   1. Contractor shall not charge Owner, and Owner shall not be liable for payment of, taxes from which Owner is exempt by law.
   2. Purchases of expendable items such as form lumber, tools, oils, fuel, or equipment rentals are subject to the application of the Ohio Sales or Use Tax.

C. Contractor shall pay all income taxes and payroll taxes required by local jurisdictions.

1.05 PERMITS AND FEES:

A. The Architect will apply for Plan Approval, including General, Mechanical, Electrical, Plumbing, Sprinkler, and Fire Alarm work.
   1. All communications related to plan approval, including shop drawing submittals, are required to be made through the Architect.
   2. Coordinate shop drawing submittals and correction letter responses with the project schedule, planned not to exceed the allowable number of resubmittals. Fees for additional resubmittals resulting from delinquent, incomplete, or incorrect information will be the responsibility of the Contractor.

B. Contractor shall procure from the proper authorities and pay fees for permits, taps, licenses, inspections, and other charges applicable to their Work, as required by state laws, city and county ordinances, and regulations pertaining to the work.
   1. Arrange for inspections to be performed, giving notice to inspecting authorities in ample time so that work can be inspected and approved as it progresses.
   2. Do not cover or conceal work requiring inspection until inspection has been performed.
   3. At the conclusion of the installation, secure a certificate of final inspection and approval by enforcement authorities.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4210 – ABBREVIATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Definition of abbreviations used in the Contract Documents.

1.02 ABBREVIATIONS – TERMS:

A. Listed below are terms and abbreviations which may be found in the Contract Documents. Common English language terms have not been included. Refer also to Drawings and individual specification Sections for terms and abbreviations specific to those documents. Acronyms used to refer to associations and organizations are listed separately below. Where multiple definitions are listed for an abbreviation, refer to the context for the intended meaning. For abbreviations not listed, and where the intended meaning is not obvious, request interpretation from the Architect.

AC	air conditioning; alternating current
A.B.	anchor bolt
ACC.	accessible
ACOUST.	Acoustical
ADA	Americans with Disabilities Act, Standards for Accessible Design
ADJ.	adjacent; adjustable
A.F.F.	above finished floor
A.F.G.	above finished grade
AFUE	annual fuel utilization efficiency
AHU	air handling unit
ALT.	alternate
ALUM.	aluminum
AMP	ampere
ANOD.	anodized
APPROX.	approximate
ARCH.	Architect
ASSY.	assembly
ATTN.	attention
AUTO.	automatic
AUX.	auxiliary
AWG	American wire gauge
B/	bottom of
B&B	balled and burlapped
BD.	board
B.F.F.	below finished floor
BHP	brake horsepower
BLDG.	building
BLKG.	blocking
BLKHD.	bulkhead
BM	beam; benchmark
BN	bullnose
BOT.	bottom
BRG.	bearing
BSMT.	basement
BTU	British thermal unit
BTUH	British thermal unit per hour
C	Celsius; channel
CAB.	cabinet
CAP.	capacity
CAT.	catalog
CATV	community antenna (cable) television
CAV.	cavity
CB	catch basin; cementitious (backer) board
CCF	hundred cubic feet
CFM	cubic feet per minute
CFS	cold formed steel
CHW	chilled water; circulating hot water
CI	cast iron; curb inlet
CJ	construction joint; control joint
CKT.	circuit
CL	center line; class
CLG.	ceiling; cooling
CLOS.	closet; closure
CLR.	clear
CMU	concrete masonry unit
CO	cased opening; cleanout; company
COEFF.	coefficient
COL.	column
CONC.	concrete; concentric
COND.	condenser; condensate
CONF.	conference
CONN.	connection
CONT.	continue; continuous
CONTR.	contract; contractor

CONV.	convert; conventional
COORD.	coordinate
CORR.	corridor; correct
CPT	carpet
CPVC	chlorinated polyvinyl chloride
CT	ceramic tile; countertop; current transformer
CTR.	center
CU	cubic; copper; coefficient of utilization
CUH	cabinet unit heater
CW	cold water
CYL.	cylinder
D	deep; depth; penny (nail)
DAT.	datum
DB	decibel; dry bulb
DBL.	double
DC	direct current
DDC	direct digital control
DEG.	degree
DEL.	delete; deliver
DEPT.	department
DET.	detail
DF	drinking fountain
DI	ductile iron
DIA.	diameter
DIAG.	diagonal; diagram
DIFF.	difference; diffuser
DIM.	dimension
DISC.	disconnect
DISP.	dispenser; disposal
DIST.	distance; district; distribution
DL	dead load
DOC.	document
D.P.	down pipe
DR.	door
DW	dishwasher
DWG.	drawing
DWV	drain, waste and vent
EA.	each
E.C.	Electrical Contractor
EF	each face
EIFS	exterior insulation and finish system
EJ	expansion joint
EL.	elevation
ELEC.	electric
ELEV.	elevator
EMB	embedment
EP	edge of paving; electrical panel
EPDM	ethylene propylene diene monomer
EPS	expanded polystyrene
EQ.	equal
EQUIP.	equipment
EQUIV.	equivalent
ESMT.	easement
ESP	external static pressure
EST.	estimate
EW	each way
EWC	electric water cooler
EXH.	exhaust; exhibit
EXIST.	existing
EXP.	expansion; exposed
EXT.	exterior; extinguisher
F	Fahrenheit; female
FACP	fire alarm control panel
FC	footcandle
FCO	floor cleanout
FD	floor drain
FDN.	foundation
FE	fire extinguisher
FFE	finish floor elevation
FH	fire hydrant
FHMS	flat head metal screw
FIG.	figure
FIN.	finish
FIXT.	fixture
FL	flow line
FLA	full load amps
FLG.	flange; flashing
FLR.	floor
FLUOR.	fluorescent
FOUND.	foundation
FP	fire protection
FR	fire rating
FRP	fiber reinforced polyester
FRTW	fire retardant treated wood
FS	far side; Federal Specification
FT	feet; foot
FTG.	footing
FURN.	furnace; furnish; furniture
FXT.	fixture
GA	gage
GAL.	gallons
GALV.	Galvanized
GB	grade beam
GBF	granular backfill
G.C.	General Contractor
GCO	grade cleanout
GF	gas furnace
GFCI	ground fault circuit interrupter
GL	glass
GLULAM	glued laminated wood
GPM	gallons per minute
GT	girder truss
GYP.	gypsum
H	height

HB	hose bibb
HC	HVAC Contractor; hollow core
HDO	high density overlay
HDW.	hardware
HID	high intensity discharge
HM	hollow metal
HORIZ.	horizontal
HP	high pressure; horsepower
HPS	high pressure sodium
HT.	height
HVAC	heating, ventilating and air conditioning
HW	hot water
ID	inside diameter; identification
IN.	inches
INCAND.	incandescent
INCL.	included
INSUL.	insulation
INT.	interior
INV.	invert
IPS	international pipe standard; iron pipe size
IR	infrared
JAN.	janitor
JST.	joist
JT	joint
KD	kiln dried; knocked down
KIT.	kitchen
KO	knockout
KSF	thousand square feet
KVA	kilovolt amperes
KW	kilowatt
L	angle; liter
LAM.	laminate
LAV	lavatory
LB	pound; load bearing
LDG.	landing; loading
LDH	long dimension horizontal
LDV	long dimension vertical
LED	light emitting diode
LF	linear feet (foot)
LH	left hand
LL	live load; lead lined
LLH	long leg horizontal
LLV	long leg vertical
LONG.	longitudinal
LPG	liquid petroleum gas
LRA	locked rotor amps
LSL	laminated strand lumber
LTWT	lightweight
LTG.	lighting
LVL	laminated veneer lumber
MAINT.	maintenance
MAN.	manual
MATL.	material
MAX.	maximum
MBH	thousand BTU per hour
M.C.	HVAC Contractor; moisture content
MCA	minimum circuit amps
MCJ	masonry control joint
MDO	medium density overlay
MECH.	mechanical
MED.	medium; medical
MEP	plumbing, HVAC, and electrical
MFR.	manufacturer
MH	manhole
MIN.	minimum; minute
MISC.	miscellaneous
MLDG.	molding
M.O.	masonry opening; motor operated
MOD	motor operated damper
MON.	monument
MSB	mop service basin
MT.	mount
MTD.	mounted
MTG.	mounting
MTL.	metal
NC	noise criteria; normally closed
NEC	National Electrical Code (NFPA 70)
NIC	not in contract; noise isolation class
NO	number; normally open
NOC	notice of commencement
NRC	noise reduction coefficient
NS	near side
N.T.S.	not to scale
OA	outside air; overall
OAI	outside air intake
OC	on center
OCC.	occupant
OD	outside diameter
OH	overhead
OPG.	opening
OPP.	opposite
OPT.	optional; optimum
OZ.	ounce
P	pole
PART.	partial
PC	Plumbing Contractor; point of curve
PEMB	pre-engineered metal building
PEND.	pendant
PERF.	perforated
PERIM.	perimeter
PERM.	permanent
PERP.	perpendicular
PH	phase
PI	point of intersection

PIV	post indicator valve
PKG	package; parking
PL	plate; property line
P. LAM.	plastic laminate
PLBG.	plumbing
PLYWD.	plywood
PNL.	panel
PORC.	porcelain
PORT.	portable
POS	positive; position
PREF.	preference
PREFAB.	prefabricated
PREFIN.	prefinished
PRELIM.	preliminary
PREV.	previous
PROJ.	project
PSF	pounds per square foot
PSL	parallel strand lumber
PT	preservative treated; post tensioned
PVC	polyvinyl chloride
QT	quarry tile
QTY.	quantity
R	radius; thermal resistance
RA	return air
RCB	rubber cove base
RD	roof drain
REBAR	reinforcing steel bars
RECIRC.	recirculation
RECEPT.	reception; receptacle
RECT.	rectangular
REF.	reference; refrigerator
REFL.	reflected
REINF.	reinforcing; reinforced
REQD.	required
RESIL.	resilient
REV.	revision
RH	right hand; relative humidity
RM.	room
R.O.	rough opening
RPM	revolutions per minute
RS	rough sawn; rapid start
RSB	rubber straight base
RTU	rooftop unit
R/W	right of way
S4S	surfaced four sides
SA	supply air
SAN.	sanitary
SAT	suspended acoustical tile
SC	Site Contractor; solid core; shading coefficient
SCHED.	schedule
SCWD	solid core wood
SENS	sensible
SF	square feet (foot)
SGFT	structural glazed facing tile
SHT.	sheet
SIM.	similar
SL	step ledge
SM.	small
SP	static pressure
SP., SPA.	spaces
SPKR.	speaker
SQ.	square
SRD	secondary roof drain
SS	service sink; stainless steel
ST	storm
STC	sound transmission class
STD.	standard
STIFF.	stiffener
STL.	steel
STOR.	storage
STRUCT.	structural
STW	step top of wall
SURF.	surface
SUSP.	suspended
SV	sheet vinyl
SW	switch
SWR.	sewer
SYM.	symbol; symmetrical
SYS.	system
T/	top off
T&G	tongue and groove
TAN.	tangent
TB	through bolt; test boring
TC	top of curb
TEL.	telephone
TEMP.	temporary; temperature; tempered
TERM.	terminal
THK.	thickness
TOIL.	toilet
TP	top of pavement; telephone pole; toilet paper
TRANS.	transparent; transverse; transom
TS	tube steel
TYP.	typical
U	heat transfer coefficient
UC	under cabinet
UG	underground
UH	unit heater
UNO	unless noted otherwise
UR.	urinal
UTIL.	utility
UV	unit ventilator; ultraviolet
V	volt
V.B.	vapor barrier; vertical bracing
VCT	vinyl composition tile

VERT.	vertical	WCO	wall cleanout
VFY.	verify	WD	wood
VIF	verify in field	WDW.	window
VNR	veneer	WH	wall hydrant; water heater
VOC	volatile organic compound	WOLM.	preservative treated
VOL.	volume	WP	work point
VTR	vent through roof	WT	weight
VWC	vinyl wall covering	WWF	welded wire fabric
W	watt; width; west; wall	XFMR	transformer
W/	with	XFR	transfer
W/O	without	XPS	extruded polystyrene
WC	water closet; water column	YD	yard

1.03 ABBREVIATIONS – ASSOCIATIONS AND ORGANIZATIONS:

AASHTO	American Association of State Highway and Transportation Officials
ABAA	Air Barrier Association of America
ACI	American Concrete Institute
ADC	Air Diffusion Council
AFPA	American Forest and Paper Association
AGA	American Gas Association
AHA	American Hardboard Association
AHRI	Air Conditioning, Heating, and Refrigeration Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALA	American Laminators Association
ALSC	American Lumber Standards Committee
ANSI	American National Standards Institute
APA	The Engineered Wood Association
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builder’s Hardware Manufacturer’s Association
BIA	Brick Institute of America
BICSI	Building Industry Consulting Service International
CDHS	California Department of Health Services
CISCA	Ceilings and Interior Systems Contractors Association
CISPI	Cast Iron Soil Pipe Institute
CMHA	Concrete Masonry and Hardscapes Association
CPSC	Consumer Products Safety Commission
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DHI	Door Hardware Institute
DIN	Deutsches Institut für Normung
DOC	Department of Commerce
ECIA	Electronic Components Industry Association
EPA	Environmental Protection Agency

FCC	Federal Communications Commission
FGIA	Fenestration & Glazing Industry Alliance
FM	Factory Mutual Engineering Corporation
FSC	Forest Stewardship Council
GA	Gypsum Association
HMMA	Hollow Metal Manufacturers Association
HPVA	Hardwood Plywood and Veneer Association
IAPMO	International Association of Plumbing and Mechanical Officials
ICC	International Code Council
ICC-ES	International Code Council Evaluation Service
ICEA	Insulated Cable Engineers Association
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IETF	Internet Engineering Task Force
INDOT	Indiana Department of Transportation
ISO	International Organization for Standardization
MBMA	Metal Building Manufacturers Association
MIC	Masonry Industry Council
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
NAAMM	National Association of Architectural Metal Manufacturers
NCPWB	National Certified Pipe Welding Bureau
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NFSHSA	National Federation of State High School Associations
NHLA	National Hardwood Lumber Association
NJATC	National Joint Apprenticeship and Training Committee for the Electrical Industry
NLGA	National Lumber Grades Authority
NRCA	National Roofing Contractors Association
NSF	National Sanitation Foundation
NSI	Natural Stone Institute
NTMA	National Terrazzo & Mosaic Association
NWWDA	National Wood Window and Door Association
OBC	Ohio Building Code
ODOT	Ohio Department of Transportation
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PDI	Plumbing and Drainage Institute
PS	Product Standards
RFCI	Resilient Floor Covering Institute
SDI	Steel Deck Institute
SDI	Steel Door Institute
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPIB	Southern Pine Inspection Bureau
SPRI	Single Ply Roofing Industry
SSPC	Society for Protective Coatings
TCNA	Tile Council of North America
TIA	Telecommunications Industry Association
TPS	Technical Preservation Services, National Park Service
UBC	Uniform Building Code

UL	Underwriters Laboratories
USC	University of Southern California
USGBC	U. S. Green Building Council
WDMA	Window and Door Manufacturers Association

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 4520 – TESTING AND INSPECTING SERVICES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Testing and inspecting services.

1.02 TESTING AND INSPECTING SERVICES:

A. Coordinate inspection and testing work with independent testing firm employed by Owner. The testing firm will perform inspections, tests, and other services scheduled in this Section and as required by the Architect.
   1. At Owner's option, more than one firm may be employed.
   2. Testing required by individual specification Sections and not scheduled below, shall be performed at the Contractor's expense by a qualified independent testing firm acceptable to Architect and Owner.

B. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by the Architect.

C. The testing firm shall promptly submit reports indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
   1. Non-compliance of any portion of Work with Contract Document requirements shall be cause for rejection of that portion of Work.
   2. Retesting required because of non-conformance to specified requirements shall be performed by the same testing firm at Contractor's expense on instructions from the Architect.
   3. The testing firm is not authorized to revoke, alter, relax, enlarge, or release any requirement of the Contract Documents.

D. Cooperate with testing firm; furnish samples of materials, design mix, manufacturer or supplier certifications, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Architect and testing firm 48 hours prior to expected time for operations requiring services.
   2. Make arrangements with testing firm and pay for additional samples and tests required for Contractor's use.

E. Testing or inspecting does not relieve Contractor from performing work in full compliance with Contract Documents.

1.03 SUBMITTALS:

A. The testing firm shall distribute copies of each test report to the Architect and Contractor.

B. The first copy of each type of report, and all test reports indicating non-compliance with specified requirements, shall be submitted promptly, but not more than 72 hours after test results are available.

C. Remaining test reports shall be submitted at weekly intervals.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 SCHEDULE OF TESTING AND INSPECTING SERVICES:

A. Refer to Drawings for special inspections required by building code. Provide additional testing and inspection as scheduled herein. Except for code required special inspections, scope of testing work is subject to modification at the discretion of the Owner.

B. Earthwork Testing: Site and building excavating and backfilling.

1. Testing firm shall employ a full-time Soils Engineer and Soils Laboratory qualified in soils testing and evaluation to observe site grading, placement of fill, and excavation and backfill for building pad, site drainage system, and site utilities, and perform the activities scheduled below.

2. Analyze native and imported fill and backfill material and top soil proposed for use to determine suitability for use and compliance with Contract Documents.
   a. Test fill and backfill material to determine soil classification, plasticity index, optimum moisture content, and dry density.

3. Field test natural grades to be retained, areas of cut, and areas of controlled fill and backfill to determine moisture content, percent of compaction and compliance with specified values. Provide minimum one test, with additional tests as scheduled below, and at the discretion of the Soils Engineer.
   a. Building Area: One test for every 500 cubic yards of fill and backfill, or in areas of natural grade or cut one test for every 10,000 square feet, located to give equal coverage to all portions of the building subgrade.
   b. General Site Areas: One test for every 2000 cubic yards of fill and backfill, or in areas of natural grade or cut one test for every acre, located to give equal coverage to all earthwork areas.
   c. Paved Areas (Except Trench Excavation and Road Construction): One test for every 2000 cubic yards of fill, or in areas of natural grade or cut one test for every 40,000 square feet.
   d. Trench Excavation and Road Construction: One test for every 500 cubic yards or 100 lineal feet of fill or backfill.
   e. Exterior Slabs and Walks: One test for each air slab location, and one test for every 50 lineal feet of walk.

4. Observe building foundation excavation and subgrade preparation; confirm size, depth, and suitability of the excavated areas; test soil bearing capacity to verify compliance with specified values; test porous fill to determine soil classification, depth, and percent of compaction.
   a. Test soil bearing capacity of one column footing per 5000 square feet of building area, and every 100 lineal feet of wall foundation. Test results must indicate in-place soil bearing capacity.

5. Topsoil Analysis: Provide soil analysis stating percentages of organic matter, inorganic matter (silt, clay and sand), deleterious material, pH, and mineral and plant nutrient content.
   a. Report suitability of topsoil for lawn growth and planting beds. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.

C. Concrete Testing:

1. Testing firm shall test all building concrete and Portland Cement concrete pavement. The firm's personnel shall obtain and adequately protect samples during storage and transporting.
   a. Check batching and mixing operation periodically for compliance with the Contract Documents.
   b. Review the manufacturer's mill test certificate for each shipment of cement and reinforcing steel, or conduct laboratory tests or spot checks of these materials as received.
   c. Mold and test concrete field cylinders as scheduled.

2. Observe placement of reinforcing bars and mesh; verify size, spacing, lap dimensions, chairs and supports, concrete cover and surface condition of reinforcing is as specified; verify adequacy of formwork and ties to prevent movement during concrete placement.

3. Test concrete materials as follows:
   a. Aggregate: ASTM C33.
   b. Cement: ASTM C150; accompany all cement used on the job with a testing agency certificate indicating compliance of cement with all tests.

4. Test concrete for slump and strength as follows:
   a. Secure composite samples in accordance with ASTM C172 from each mix design placed in any one day, or from each 100 cubic yards of concrete placed in continuous pours, whichever is less.
   b. Cast cylinder specimens from each sample; cure cylinders in accordance with ASTM C39. Test cylinders for 7-day and 28-day strength. Test reports shall include temperature of air and concrete at site, mix proportions and all data necessary to determine compliance with Contract Documents.

c. Determine slump of the concrete for each sample and whenever consistency of concrete appears to vary; test in accordance with ASTM C143.
d. Test a portion of the air-entrained concrete samples to determine the amount of entrained air, in accordance with either ASTM C231 or ASTM C173.
(1) If these tests indicate at any time that air content is not within specified limits, the Contractor at his expense shall modify the materials as necessary to achieve compliance.

5. If the average strength of test cylinders for any portion of the structure constitutes a failure as defined in ACI 318, or if slump is beyond tolerances, the Architect may require changes in the concrete mix proportions at the Contractor's expense, may require additional testing in accordance with ASTM C42, or may declare all concrete work, of which the non-complying cylinders are representative samples, in violation of the Contract Documents.

6. If the work is in violation of the Contract Documents, or if there is a likelihood of the concrete having been frozen, the Contractor shall make loading tests at his expense, if so directed by the Architect. If the unit area or member under consideration fails to pass the loading test or shows evident signs of failure, the Contractor shall remove and rebuild the defective construction at his expense, or shall provide at his expense such additional construction as the Architect considers necessary to make the structure sound.
a. Conduct loading tests in the presence of representatives of the Owner and Architect in accordance with Chapter 20 of ACI 318.

D. Masonry Testing: ACI 530.

1. Test compressive strength of mortar and grout in accordance with ASTM C109 and ASTM C780. Cast one set of 3 specimens for each 5000 square feet of masonry wall construction for each type of mortar and grout.
a. Mortar: 2 inch cubes.
b. Grout: 3 x 3 x 6 inch mockups.

2. A qualified inspector shall observe masonry construction and grouting, and submit reports using CMHA TEK 18-3 Level B as a guideline.

3. Provide full-time on-site observation of flashing and weep installation. Provide photograph or video record of flashing installation at each typical condition, and at each lap, interruption, or penetration of flashing. Submit one copy to Architect, with locations identified on plan or elevation drawing.

E. Structural Steel Inspection: AISC 360.

1. An inspector qualified to inspect bolted steel connections in accordance with the Specifications of the RCSC shall inspect bolted connections.
a. Snug Tight Joints Not Designated as Slip Critical: Inspect 25 percent of all connections.
b. Other Connection Types: Inspect all connections.

2. Visually check connections for the use of proper bolt type, size and washer installation; determine that all plies of the connected material are in firm contact and that the provisions of the RCSC Specification have been satisfied.
3. Contractor shall re-tighten all bolts in any connection which fail inspection and resubmit the connection for re-inspection. All costs for re-tightening and re-inspection of the connection shall be borne by the Contractor.
4. Steel Joists: Periodically inspect bridging, and welded or bolted end connections, in accordance with SJI.

F. Paving Testing:

1. Testing firm shall employ an Engineer qualified to perform pavement testing services in accordance with AASHTO and ASTM standards.
2. Review mix designs submitted by Contractor.
3. Test aggregate base course for compliance with specified physical requirements and sieve analysis. Observe installation for compacted thickness, cross section, and grade. Conduct field density tests to determine optimum moisture content and percent of compaction.
   a. Aggregate: ASTM D1241.
   b. Field Density: ASTM D1557; number at discretion of Engineer, minimum one test per 40,000 square feet.
4. Test asphaltic concrete mix for asphalt cement content, gradation, Marshall stability, air voids, and physical requirements. Observe asphaltic concrete placement for number of lifts, procedure employed and compliance with indicated cross section and grade. Perform field density and extraction tests to determine percent of compaction.
   a. Asphaltic Concrete Mix: ASTM D2172 or AASHTO T164, and AASHTO T30.
   b. Optimum Asphalt Cement: Marshall Method or other AASHTO approved methods.
5. Test Portland Cement Concrete pavement in accordance with concrete testing requirements as scheduled in this Section.

END OF SECTION

SECTION 01 4527 – EMERGENCY RESPONDER RADIO COVERAGE TESTING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Radio frequency testing for emergency responder radio coverage.

1.02 ABBREVIATIONS:

A. AHJ: Authority Having Jurisdiction.

B. DAQ: Delivered Audio Quality.

C. ER: Emergency Responders.

D. RF: Radio Frequency.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Submittals for Information:
   1. Statement of qualifications.
   2. List of frequencies to be tested.
   3. Cut sheets of the instruments used for testing. Instruments are subject to approval by Owner and Architect.
   4. Contact information of ER officials and AHJ.
   5. Description of proposed testing procedures and method of documentation.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Test Reports: Include in O&M manuals.
   1. Verify formatting requirements with AHJ.
   2. Provide numeric data in spreadsheet format.
   3. Provide building floor plans with test grid and locations indicated. For each test area, indicate "Pass" or "Fail" results for each frequency tested.
   4. Indicate date, time, temperature, humidity, and weather conditions during testing.
   5. Provide narrative report summarizing test methodology, instruments utilized, overall test results, and conclusion of facility conformance or non-conformance to applicable code requirement.

1.05 QUALITY ASSURANCE:

A. Qualifications: Testing firm shall meet one of the following:
   1. Firms regularly engaged and familiar with RF testing systems and RF transmission principles with minimum 3 years' experience and 5 projects of similar type.
   2. Professional Engineer on staff, licensed in the state where the Project is located.
   3. Registered Communications Distribution Designer (RCDD) on staff.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 PREPARATION:

A. Before testing, verify and coordinate the following with the AHJ:
   1. All frequencies used by emergency responders within the jurisdiction.
   2. Locations of receiver base stations, repeaters, or boosters in the radio system, if any.
   3. AHJ representation during testing, either on site or at receiver base station.
   4. Waiver of radio coverage in accordance with Ohio Fire Code 510.1, Exception 1 or 2, if applicable.

3.02 TESTING:

A. Test radio frequencies used by the ER for two-way coverage on each floor of the building.

B. Measurements in 95 percent of all areas on each floor of the building shall meet a minimum signal strength of -95 dBm both into and out of the building.

C. RF Signal Strength Test:

   1. Conduct test using a spectrum analyzer calibrated within the last 12 months, utilizing antennas similar to those in use by the ER.

   2. Where signal strength out of the building cannot be efficiently measured, conduct a DAQ test using a calibrated portable radio of the latest brand and model used by the ER talking through the ER's radio communications system.

   3. Divide each floor of the building into a grid of 20 approximately equal test areas.

   4. Select a test location approximately in the center of the test area to represent the test area, with the radio enabled to verify two-way communications to and from the outside of the building through the ER's radio communications system. Failure in the selected test location shall be considered failure of the test area.

   5. Take measurements at 3 feet to 4 feet above the floor with antenna in a vertical position, to simulate portable radios worn on the belt or turnout coat pocket.

   6. Maximum one test area, or 5 percent of nonadjacent test areas, shall be allowed to fail the test per floor.

   7. In the event two or more test areas, or more than 5 percent, fail the test, the floor may be divided into 40 approximately equal test areas and retested. Maximum one test area, or 5 percent of nonadjacent test areas, per floor shall be allowed to fail the 40 area test.

D. Voice Signal Quality Test:

1. Take DAQ readings at the same time as RF signal strength measurements.
2. DAQ Scale:
   a. DAQ 1.0: Unusable. Speech present but not understandable.
   b. DAQ 2.0: Speech understandable with considerable effort. Requires frequent repetition due to noise or distortion.
   c. DAQ 3.0: Speech understandable with slight effort. Requires occasional repetition due to noise or distortion.
   d. DAQ 3.4: Speech understandable without repetition. Some noise or distortion present.
   e. DAQ 4.0: Speech easily understandable; little noise or distortion.
   f. DAQ 4.5: Speech easily understandable; rare noise or distortion.
   g. DAQ 5.0: No noise or distortion discernable.
3. A DAQ level of 3.0 or better throughout the building shall be deemed acceptable and passing.

END OF SECTION

SECTION 01 5000 – TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Temporary Utilities: Electricity; lighting; heat and ventilation; telephone and internet; water.
   2. Construction Facilities: Temporary buildings; sanitary facilities.
   3. Access facilities.
   4. Temporary barriers, enclosures, fencing, and security.
   5. Temporary Controls: Fire protection; snow removal; water control.

B. Related Requirements:
   1. Section 01 7000 – Execution Requirements: Progress cleaning, waste management and disposal; protecting installed construction.
   2. Section 01 7700 – Closeout Requirements: Final cleaning.

1.02 REGULATORY REQUIREMENTS:

A. Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
   1. Building code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police, fire department, and rescue squad rules.
   5. Environmental protection regulations.

B. Engage the appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
   1. Arrange with company and existing users for a time when service can be interrupted.
   2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked in services.
   3. Obtain easements to bring temporary utilities to the site where existing easements cannot be used for that purpose.

C. Provide plan approvals and permits for temporary buildings, where required by authorities having jurisdiction.

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

1.03 PROJECT CONDITIONS:

A. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on site.

B. Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

1.04 TEMPORARY ELECTRICITY:

A. Provide and pay for power service required from utility source. Provide metered temporary electric feeder from electrical service at location as directed.
   1. Service Characteristics: Minimum 120/208 volt, three phase, four wire, amperage as required. Provide temporary distribution transformers as required to step down to 120 Volts.
   2. Provide service disconnect and overcurrent protection at convenient location.

B. Prior to availability of temporary electrical service, provide generator as required.

C. Provide grounding and ground fault circuit protection as required.

D. Permanent convenience receptacles may not be utilized during construction without written approval.

E. Provide adequate distribution equipment, wiring, and outlets to provide circuits for power and lighting.
   1. Provide load center panel with main disconnect and minimum six 20 ampere circuits at the point of service.
   2. Provide 20 ampere duplex outlets on single phase branch circuits for power tools and fractional horsepower motors for every 2500 sq ft of active work area, located so that extension cords need not exceed 100 feet. Install outlets in outlet boxes with cover plates.
   3. Provide 20 ampere single phase branch circuits for lighting.
   4. Provide temporary service to field offices.

F. Use of temporary electrical power system for welding operations is prohibited.

G. Electrical Power Cords: Grounded extension cords; hard service type where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length voltage ratio.

H. Upon changeover to permanent electrical service, remove portions of the temporary electrical service no longer needed, including power and lighting distribution and utilization equipment and wiring.

1.05 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES:

A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 5 footcandles. Provide additional lighting for performance of tasks.
   1. At stairs and elevator shafts, provide minimum one 1200 lumen fixture at each floor and intermediate landing.
   2. At corridors, provide minimum one 3400 lumen fixture at 20 foot maximum spacing.
   3. Provide lighting at each fire hydrant, siamese connection, fire extinguisher location, electric panel, mechanical equipment location, corridor, and building entrance.

B. Provide and maintain lighting to exterior staging and storage areas after dark for security purposes to achieve a minimum lighting level of 1 footcandle.

C. Provide and maintain lighting to interior work areas after dark for security purposes to achieve a minimum lighting level of 0.25 footcandles.

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

E. Provide guard cages or tempered glass enclosures where exposed to breakage. Provide wet location rated fixtures where exposed to moisture.

F. Maintain lighting and provide routine repairs. Relocate temporary lighting as required during progress of the work.

G. Permanent lighting may be utilized during construction. Relamp as necessary so that all lighting is operable at Substantial Completion.

1.06 TEMPORARY HEAT AND VENTILATION:

A. Provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations.

B. Maintain temperature and humidity as required by specific construction activities, as specified in individual specification sections.

C. Provide temporary heat where needed for performance of the work, for curing or drying of recently installed work, and for protection of work in place from adverse effects of low temperatures or high humidity.
   1. After building enclosure, maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress and 60 degrees F in areas where finished work has been installed.

D. Ventilate enclosed areas to assist curing of materials, to dissipate humidity, to attain and maintain specified moisture levels, to prevent accumulation of dust, fumes, vapors, or gases, and to prevent temperatures of enclosed areas from exceeding ambient

outdoor temperatures by more than 10 degrees F when ambient outdoor temperatures are above 70 degrees F.

1. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

E. Temporary Heat Prior to Building Enclosure:

1. The facility is not considered enclosed until the permanent building shell is essentially completed with exterior openings, windows, and doors closed by permanent or temporary closures.
2. Until the facility is enclosed, provide heating for materials to prevent damage from frost or freezing and to permit construction to continue and progress uninterrupted.
3. Provide, maintain, and supervise the operation of UL approved portable direct fired heaters, fired with LP gas, kerosene, #1, or #2 fuel oil. Salamanders and electric heaters will not be permitted. Observe necessary safety precautions; do not use LP gas fired heaters in low places of construction, such as pits, tunnels, etc., which can collect heavier than air gas or fumes.
4. Do not use equipment producing carbon monoxide where fumes can contact freshly placed concrete or mortar.

F. Temporary Heat and Ventilation After Building Enclosure: Provide equipment with capacity to maintain minimum 50 degrees F space temperature, and to maintain minimum 60 degrees F space temperature once the space temperature has been raised above 60 degrees F, using one or more of the following methods:

1. Portable Units: Provide, maintain, and supervise the operation of approved temporary portable units, such as oil or gas fired unit heaters, furnaces, direct fired make-up air units, or similar equipment. Salamanders and electric heaters will not be permitted. Utilize natural gas fired units when natural gas is available. Units shall be properly vented, piped, and wired. Provide thermostat for temperature control and all required safety controls.
2. Permanent System Components: Assemble and set in place permanent HVAC system components.
   a. Install each unit complete with safety controls, filters, venting, power and fuel connections, room thermostat and necessary ductwork and piping for safe and proper operation.
   b. Supplement permanent system components with portable units as necessary to maintain required temperature and humidity.
   c. Where necessary, relocate equipment during construction to prevent interference with performance of the work.
   d. Provide and pay for operation, maintenance, lubrication, frequent and regular replacement of filters, and replacement of worn or consumed parts as necessary.
   e. Prior to Substantial Completion, install permanent filters; clean and restore equipment to new conditions except for ordinary wear.

f. Provide warranty coverage for the specified time period beginning on the Date of Substantial Completion. Confirm that temporary use of equipment does not compromise specified warranties. Provide extended warranty coverage where necessary.

G. Temporary Dehumidification: Provide temporary dehumidification equipment where equipment used for temporary heat and ventilation is not adequate to maintain specified humidity, and where necessary to achieve specified moisture emissions rates in flooring substrates prior to finish flooring application. Provide, maintain, and supervise the operation of portable dessicant dehumidifiers, mechanical dehumidifiers, or similar equipment; equip with high volume blowers and inflatable plastic ducts. Adjust equipment and duct locations daily to assure even dehumidification.

1.07 TEMPORARY TELEPHONE AND INTERNET SERVICE:

A. Provide, maintain, and pay for telephone service where required in connection with the work. Use of cellular mobile phone system is acceptable, if adequate reception can be maintained.

B. Provide, maintain, and pay for internet service where required in connection with the work. Use of cellular data system is acceptable, if adequate reception can be maintained.

C. At each field office, post a list of emergency telephone numbers including but not limited to fire, police, ambulance, poison control, and each utility company providing service to the site.

D. Contractor and each subcontractor shall provide cell phone service with minimum one phone for the on-site superintendent.

1.08 TEMPORARY WATER SERVICE:

A. Provide and maintain suitable quality water service for construction operations, temporary toilets, wash facilities, and drinking water. Connect to nearest hydrant or other approved water source. Install meter and pay cost of water used.

B. Prior to availability of water service to the site, provide portable water tanks of adequate size to meet needs of construction operations. Provide and pay for water to fill and refill tanks as necessary.

C. Provide temporary piping system of sufficient capacity to meet needs of construction operations, with minimum 1 inch piping and vacuum breakers. Comply with local utility regulations. Sterilize temporary water piping prior to use.

D. Extend branch piping with outlets located so water is available in areas where work is in progress, using maximum 100 ft hoses with threaded connections.

E. Water Hoses: Minimum ¾ inch, heavy duty, abrasion resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

F. Provide temporary pipe insulation to prevent freezing. Replace piping and hoses damaged by freezing or other causes.

1.09 TEMPORARY BUILDINGS:

A. Offices: Prefabricated mobile units; weather tight, with lighting, electrical outlets, heating and cooling equipment, equipped with sturdy furniture, drawing rack, shelving, bulletin board, and drawing display table with minimum 36 x 48 inch top. Provide space for project meetings with table and chairs to accommodate minimum one representative of the Architect, Owner, Contractor, and each major Subcontractor. Provide first aid kit and portable fire extinguisher.

B. Sheds: Weather tight, substantial, of sufficient size to hold on-site materials which are subject to weather damage. Raise floors minimum 6 inches above ground on heavy joists or sleepers.

C. Locate temporary buildings in approved locations, a minimum distance of 30 ft from existing and new structures.

D. Provide walks for access to temporary buildings from parking areas and from building.

1.10 TEMPORARY SANITARY FACILITIES:

A. Provide and maintain temporary toilets in quantity and location required by applicable codes and regulations.

B. Maintain facilities daily in clean and sanitary condition. Provide toiletry supplies.

1.11 ACCESS FACILITIES:

A. Temporary Roads and Paving:
   1. Construct and maintain temporary roads and access paths from public thoroughfares to work areas. Locate in same locations as permanent facilities where possible; extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
   2. Where temporary roads intersect public roads, comply with requirements of applicable traffic authorities. Provide warning signs for public traffic, and “Stop” signs for entrance onto public roads.
   3. Coordinate temporary roads and paving with grading and compaction of subgrade, installation and stabilization of subbase, and installation of base and finish courses of permanent paving. Minimize exposure of incomplete work to deterioration.
   4. In paved areas exposed to temporary use, delay installation of the final course of permanent paving until immediately before substantial completion.

B. Construct and maintain culverts, ramps, steps, platforms, scaffolds, and other means of access so that no portion of the Work is delayed or handicapped due to a lack of such facilities.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Where traffic must cross open trenches, provide steel plates of suitable strength, thickness and anchorage to permit traffic to cross trench. Shore and brace trench to prevent damage to traffic and utilities installed in trench.

E. Vehicular Access and Parking:
   1. Limit construction traffic on existing on-site roads to designated routes.
   2. Limit parking for private vehicles of Contractor and Subcontractor personnel to designated areas.
   3. Construct and maintain temporary gravel parking areas to accommodate construction personnel.
   4. When site space is not adequate, provide additional off-site parking.

F. Staging Areas and Material Storage:
   1. Construct and maintain temporary gravel areas to accommodate staging and outdoor storage of construction materials.
   2. Locate to coincide with permanent paved areas where applicable. Coordinate with grading and compaction of subgrade, installation and stabilization of subbase.

G. At lawn areas, remove gravel from site after parking or material storage is no longer required; finish grade and seed areas in accordance with Divisions 31 and 32.

1.12 TEMPORARY BARRIERS:

A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and public walkways required by governing authorities for public rights-of-way and for public access to existing buildings.

C. Provide protection for plant life designated to remain. Replace damaged plant life.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

E. Provide and maintain barrels with reflective tape and battery operated flashers to direct vehicular traffic away from work areas.

F. Provide barriers as required by applicable regulations at edges of openings and other hazards, painted with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against.

1.13 EXTERIOR ENCLOSURES:

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

B. Close openings of 25 square feet or less with plywood or similar materials. Close larger openings with plywood or fire retardant reinforced polyethylene securely attached to fire retardant treated wood framing.

C. Close openings through floors, roofs, and horizontal surfaces with load bearing, wood framed construction.

D. Maintain required exits for protection of life and property.

1.14 TEMPORARY FENCING:

A. Construction: Commercial grade chain link fence.

B. Provide 6 ft high fence around construction area and material storage areas; equip with vehicular and pedestrian gates with locks.

C. Where required due to construction operations and sequence, relocate or remove and reinstall temporary fencing. Repair damaged fencing.

D. Where construction sequence requires multiple relocations of temporary fencing, relocatable sections of fencing in maximum 12 foot lengths may be used, subject to approval.

1.15 SECURITY:

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Limit entry into construction areas to the following:
   1. Contractor, including employees and Subcontractors.
   2. Architect, Owner, and persons authorized by them.
   3. Regulatory agency personnel legally entitled to inspect the project.

C. Limit construction personnel to designated construction areas and access routes.
   1. Limit construction activities to Owner's property, street and highway rights-of-way, and permanent easements.
   2. Do not enter on or occupy with workers, tools, equipment, or material any ground outside the designated construction areas without written consent of the Owner of such property.
   3. Provide approved temporary signage as required to provide directional information to construction personnel and visitors.

1.16 TEMPORARY FIRE PROTECTION:

A. Provide and maintain portable fire extinguishers, readily accessible throughout areas where work is in progress, in accordance with applicable fire code and local fire department regulations. Locate fire extinguishers where convenient and effective for their intended purpose.

B. Provide minimum one 20 lb. ABC extinguisher for each 3000 square feet of floor area, but not less than one extinguisher on each floor at or near each usable stairwell. Provide additional extinguishers at locations where hazardous work is in progress, including but not limited to painting, welding, or using torches or open flames for heating or cutting.

C. Store combustible materials in containers in fire safe locations.

D. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and access routes for fighting fires.

E. Prohibit smoking in hazardous fire exposure areas.

F. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

G. At the earliest feasible date in each area of the project, complete installation of permanent fire protection facilities, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

1.17 SNOW REMOVAL:

A. Remove snow from construction roads and parking areas, work areas, material storage areas and field offices as required.

B. Do not allow the accumulation or drifting of snow on roof areas in excess of design loads.

1.18 WATER CONTROL:

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment. Architect reserves the right to require additional pumping equipment without adjustment of Contract Sum.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion. Provide temporary soil erosion and sediment control in accordance with ODOT SS 832 and Section 01 5710.

C. Control surface drainage at all areas to limit runoff onto adjacent properties to existing locations and quantities.

1.19 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS:

A. Maintain temporary utilities, equipment, and facilities as long as needed for safe and proper completion of the Work.

B. Relocate temporary utilities, equipment, and facilities as necessary to correct interference with permanent construction or to facilitate operations of other trades.

C. Remove temporary utilities, equipment, facilities, and materials as rapidly as progress of the Work allows. Perform final removal prior to Final Application for Payment.

D. Remove underground installations to a minimum depth of 3 ft. Grade site as indicated.

E. Clean and repair damage caused by installation or use of temporary work.

F. Restore existing facilities to original condition. Restore permanent facilities used during construction to specified condition. Repair damage to existing pavement and roads caused by construction operations.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 5710 – TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Temporary measures to control sediment and erosion.

B. Related Requirements:
   1. Division 31 – Earthwork: Site clearing and earth moving.
   2. Division 32 – Exterior Improvements: Lawns and grass.

1.02 SUBMITTALS FOR INFORMATION: In accordance with Section 01 3300.

A. Storm Water Pollution Prevention Plan (SWPPP): Indicate placement, location, description and quantities of temporary and permanent erosion control items.
   1. Where applicable, submit SWPPP to all authorities having jurisdiction for approval. Submit proof of approval to Architect.

B. Maintenance Inspection Reports: Complete within 7 days of each inspection, using ODOT SS 832 Appendix A or similar form approved by governing authorities. Maintain log on site. Indicate date of inspection, name of inspector, amount and date of last rainfall; for each control feature, indicate whether the control feature has been installed, whether it is effective, condition, whether remediation is required, whether final stabilization has been achieved, and whether the control feature has been removed. Note comments and actions required.

1.03 REGULATORY REQUIREMENTS:

A. Conform to applicable requirements of state Environmental Protection Agency and other governing authorities.

B. Where applicable, obtain permits related to the work of this Section, including but not limited to the National Pollutant Discharge Elimination System (NPDES) Permit; pay required fees. Provide Notice of Intent and Notice of Termination as required and at the times required to not delay the progress of the work.

C. Cooperate with regulatory agency or authority and provide data as requested.

D. In the event that an assessment or fine is made or levied against the Owner as a result of Contractor's refusal or failure to comply with permit requirements, the Owner shall pay the cost of such assessment or fine and deduct the amount from the Contract Sum as liquidated damages.

1.04 PROJECT CONDITIONS:

A. Take all control measures necessary to prevent damage from flooding, erosion, and sedimentation to on-site and off-site areas throughout the entire construction period, in

accordance with ODOT SS 832, and applicable requirements of authorities having jurisdiction.

B. Where permanent control provisions are part of the work, coordinate temporary control features to provide economical, effective and continuous erosion control during and after construction.

C. Limit surface area of erodible earth during site preparation and earthwork activities; preserve existing vegetation where practical.

D. Excess soil stockpiled on site shall be removed or permanently stabilized prior to Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Temporary Seeding and Mulching: ODOT 659.09, Type 7; annual ryegrass.

B. Filter Fabric Fence: ODOT 712.09, Type C.
   1. Perimeter: 30 inch wide fabric with sound wood supports spaced at maximum 10 feet o.c.
   2. Inlet Protection: 18 inch wide fabric with 2x4 lumber supports.
   3. Ditch Checks: 30 inch wide fabric with sound wood supports spaced at maximum 10 feet o.c.

B. Dikes: Suitable material in accordance with ODOT 203.

C. Bale Filter Dikes: Straw or hay bales.

D. Slope Drains: Pipe, pipe caps, coarse aggregate, riprap, rock channel protection or other materials.
   1. Pipe Caps: Designed to connect to pipe, with one minimum ¼ inch diameter hole per square inch of cross sectional end area.

E. Rock Check Dams: ODOT 703.19, Type C or D without filter.

F. Sediment Dams or Basins: ODOT 703.19, Type C or D with filter.

PART 3 EXECUTION

3.01 INSTALLATION OF CONTROL FEATURES:

A. Temporary Seeding and Mulching: Apply in accordance with ODOT 659 to inactive cleared and grubbed areas scheduled to remain idle for more than 45 days, within 7 days following clearing and grubbing operations, or within 2 days for areas within 50 feet of a body of water.
   1. Prepare seed bed and apply fertilizer at ½ the rate indicated in ODOT 659.
   2. Apply seed at a rate of 2 pounds per 1000 square feet. Do not place seed on frozen ground.
   3. Maintain seeded areas, including watering and mowing.

4. Perform permanent seeding in accordance with Section 32 9200 within 7 days after obtaining final grade.

B. Perimeter Controls: Install concurrent with clearing and grubbing operations.
   1. Construct perimeter filter fabric fences in accordance with ODOT Standard Drawings to prevent sheet flow runoff to water bodies, wetlands, areas beyond construction limits, and other designated areas.
   2. Construct dikes to prevent sheet flow runoff from entering construction limits, and barren areas within construction limits.

C. Inlet Protection: Construct filter fabric fences around storm drain inlets and manholes in accordance with ODOT Standard Drawings, as soon as the inlet is completed. Excavate 6 inch trench around inlet; construct 2x4 wood frame with posts driven 6 inches below the excavated trench bottom. Place fabric around frame with 6 inches of fabric in trench; stretch fabric tightly and secure to frame, overlapping one side so that fabric ends are not attached to the same post. Backfill excavated soil onto fabric and compact tightly.

D. Slope Protection: ODOT 670; divert water from bare soil and protect cut and fill slopes.
   1. Construct dikes at top of fill slopes to protect side slopes from erosion.
   2. Construct dikes and slope drains when no filling activity occurs for 3 or more weeks and when slope height is greater than 8 feet.
   3. Construct ditches at top of cut slopes prior to beginning slope cutting operations to reduce runoff potential.

E. Ditch Checks: Construct in accordance with ODOT Standard Drawings across the width of the ditch, concurrent with ditch cutting operations, to protect ditches from erosion and to filter sediment from flowing water.
   1. Drainage Area 2 Acres or Less: Filter fabric fence.
   2. Drainage Area 2 to 5 Acres: Rock check dam.

F. Bale Filter Dikes: Construct in accordance with ODOT Standard Drawings, concurrent with grubbing operations. Locate a few feet from the toe of a slope to filter or divert sediment to an appropriate control before entering a body of water or leaving construction limits. Utilize bale filter dikes to collect sediment for a maximum of:
   1. ¼ acre without an outlet.
   2. Slope length of 100 feet at a maximum slope of 2:1.
   3. Use outlet or pit every 100 feet for a 2:1 slope. Use greater spacing for flatter slopes.

G. Sediment Dams or Basins: Construct in accordance with ODOT 203 at the first step of grading and within 7 days of commencing grubbing operations.
   1. Construct basins and dams at concentrated and critical flow locations to settle sediment out before leaving construction limits.
   2. Construct basins at bottom of ravines, at culvert inlets and outlets, along or at the end of ditches, and at concentrated sediment exit points. Size basins to provide a minimum quantity of 67 cubic yards for each acre of drainage area.

H. River, Stream and Water Body Protection: Line water edges with perimeter filter fabric fences or bale filter dikes. Divert project sediment flow with slope protection. Combine temporary control features and utilize other control features as necessary to protect all streams and water bodies passing through or on the project site. Construct concurrent with grubbing operations.

3.02 MAINTENANCE AND REMOVAL OF CONTROL FEATURES:

A. Inspections: Inspect erosion control features every 7 days and within 24 hours of any rainfall of more than ½ inch. Repair damaged, failed and non-functional control features; install additional control features; make adjustments to meet field conditions and prepare for anticipated future work, as required.

B. Maintain temporary controls in place until drainage areas are fully stabilized; remove remaining items at Substantial Completion.

C. Remove accumulations of silt and sediment in accordance with ODOT 203.05; dispose of off-site.

D. Filter Fabric Fences, Dikes and Bale Filter Dikes: Remove trapped sediment and clean when sediment reaches half the height of the lowest section. Maintain control features until up slope permanent grass coverage is minimum 70 percent.

E. Sediment Dams and Basins: Remove deposited sediment when initial volume has been reduced by half. Remove dams and basins concurrent with permanent seeding and mulching operations.

END OF SECTION

SECTION 01 6000 – PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Basic product requirements.
   2. Product options.
   3. Substitution procedures.
   4. Product delivery requirements.
   5. Product storage and handling requirements.

1.02 BASIC PRODUCT REQUIREMENTS:

A. Provide new equipment and materials meeting quality standards of the manufacturer. Defective, damaged, reconditioned, or substandard equipment and materials are not acceptable. Remove unacceptable materials incorporated in the Work, replace with sound materials meeting specified criteria, and perform related corrective work to meet approval of Architect.

B. Provide all equipment and materials required for complete assemblies and systems. Omissions of specific reference to incidental parts or accessories required does not constitute a release from furnishing such items.

C. Products of the same type shall be provided by the same manufacturer unless specifically approved by the Architect.

D. Products requiring electrical connection shall be listed and classified by Underwriters Laboratories, Inc., or other testing firm acceptable to the authority having jurisdiction, as suitable for the purpose specified and indicated.

E. Do not use materials containing asbestos.

F. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

G. Provide interchangeable components of the same manufacture, for components being replaced.

H. Finishes:
   1. Where multiple colors, patterns, or finishes are available, selection will be made from manufacturer's standard range unless specifically indicated otherwise. Submit samples for selection under the provisions of Section 01 3300.
   2. If not otherwise specified, provide equipment with manufacturer's standard baked enamel finish or equal. Do not field paint equipment unless specifically noted in the Contract Documents.

1.03 PRODUCT OPTIONS:

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers, Fabricators, or Installers: Products of manufacturers, fabricators, or installers named and meeting specified criteria, standards and description. Submit a request for substitution in accordance with the following article for any manufacturer, fabricator, or installer not named.
   1. Where a manufacturer is listed by name only without model numbers or specific product reference, a request for substitution is not required. Where products of another manufacturer are listed by model number, provide the closest equivalent product meeting the specified requirements.
   2. All Products must meet specified criteria, standards and descriptions. For manufacturers listed by name only without model numbers or specific product reference, standard products may require modifications and accessories, which shall be included.
   3. Drawings and details incorporate design parameters specific to the products of manufacturers listed by model number in the specifications and schedules. Where equivalent products of other listed manufacturers are provided, coordinate related work and the work of other trades with the requirements of the products provided. Items requiring coordination include, but are not limited to, unit dimensions and clearances, roof openings and curbs, unit weight and structural supports, housekeeping pad dimensions, piping, venting, electrical requirements, controls, panelboard and light fixture dimensions and clearances, motor controls and connections, and equipment connections.
   4. Where a product listed by model number or specific product reference has been superseded or replaced by a different Product from the same manufacturer, provide the replacement Product, but not before submitting product data in accordance with Section 01 3300 for approval, specifically indicating all differences between the specified Product and the replacement Product.

C. The phrase "or equal" or similar language does not exempt substitutions from compliance with the following Substitution Procedures. No substitutions are permitted unless specifically approved in writing for this Work by the Architect.

1.04 SUBSTITUTION PROCEDURES:

A. Architect will consider requests for Substitutions only prior to receipt of bids or within 15 days after date of Notice to Proceed. Due to time constraints, requests made later than 5 business days prior to the scheduled bid opening may not be reviewed. Submit request for Substitution to the Architect.

B. Requests for Substitutions may be made by Prime Bidders/Contractors only. Requests made by others will not be considered unless made jointly with a Prime Bidder/Contractor.

C. Bids shall include specified Products only, unless Substitution is approved by Addendum issued prior to receipt of bids.

D. Substitutions requested more than 15 days after date of Notice to Proceed may be considered or rejected without consideration, at the discretion of the Architect, and are limited to the following circumstances:

   1. Specified Products become unavailable through no fault of the Contractor. Such Substitutions shall not result in additions to the Contract Sum or Contract Time.

   2. The Substitution offers the Owner a substantial advantage in initial cost, life cycle cost, time, energy conservation, sustainable design, or other considerations, after deducting costs for redesign and coordination. Requests for such Substitutions shall include detailed information on the changes to the Contract Sum and Contract Time, including that of separate Contractors.

   3. None of the specified Products can meet the requirements of the Contract Documents, or receive necessary approval by a governing authority, and the Contractor certifies that the Substitution will meet the requirements. Such Substitutions shall not result in additions to the Contract Sum or Contract Time, except to the extent caused by regulatory requirements enacted or modified after the bid date.

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

F. Substitutions will be reviewed for general conformance with the intent of the Contract Documents but not for detailed compliance with all specified requirements. Approval of substitutions does not relieve the Contractor of the responsibility to comply with the Contract Documents, unless the variation is specifically identified in the substitution request.

G. Substitutions incorporated in the Work without Architect's approval shall be removed and replaced with specified Products without additions to the Contract Sum or Contract Time.

H. Substitution Submittal Procedure: Submit Substitution Request Form attached, or provide a cover letter with equivalent information. Limit each request to one proposed Substitution.

   1. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents. Documentation shall specifically note variations from specified Products in function, dimensions, weight, appearance, quality, code compliance, durability, availability of service and parts, and interfaces with related construction.

   2. Submit product data, certified test results, and other supporting data sufficient to demonstrate the proposed Product equivalence. Burden of proof is on proposer.

At Architect's option, installation references and samples of actual products may be required.

3. For products specified to receive warranty coverage, Substitution request shall include a preliminary copy of the specific warranty.
4. Submittal of a Substitution request, or incorporation in the Work of an approved Substitution, constitutes a representation that the submitter:
   a. Has personally investigated proposed Product and determined that it meets or exceeds the function, appearance, sustainable design requirements, and quality level of the specified Product.
   b. Will provide the same warranty for the Substitution as for the specified Product.
   c. Will coordinate installation and make changes to other Work, including the Work of separate Contractors, which may be required for the Work to be complete without additions to the total Contract Sum or Contract Time.
   d. Waives claims for additional costs or time extension which may subsequently become apparent.
   e. Will reimburse Owner and Architect for review or redesign services if re-approval by authorities is required.
5. Architect will notify submitter of decision to accept or reject request. Architect's decision is final.
6. Architect reserves the right to reject requests not containing sufficient information to enable Architect to completely evaluate the request without delay in the scheduled bid opening.

1.05 PRODUCT DELIVERY REQUIREMENTS:

A. Schedule deliveries to coordinate with installation schedule, to minimize long term storage at site and to minimize possibility of damage, deterioration, theft and other losses.

B. Transport and handle Products in accordance with manufacturer's instructions.

C. Accept Products at site, including unloading and uncrating. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

1.06 PRODUCT STORAGE AND HANDLING REQUIREMENTS:

A. Store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible.

B. Store sensitive Products in weather tight, climate controlled enclosures.

C. For exterior storage of fabricated Products, place on sloped supports, above ground.

D. Provide off-site storage and protection when site does not permit on-site storage or protection.

E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.

F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store and handle Products by methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of Products to prevent overcrowding and to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

I. Do not exceed manufacturer's shelf life limitations. Discard and replace Products not installed prior to stated expiration date.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 ATTACHMENTS:

A. Substitution Request Form.

END OF SECTION

SUBSTITUTION REQUEST FORM

Specified Product:

_____	_____	_____
Section	Paragraph	Description

Proposed Substitution: _____

Attachments: _____

The undersigned requests consideration of this Substitution and certifies that the attached product data and other supporting information indicates all variations from the specified Product, in accordance with the requirements and representations of Section 01 6000, and that the following statements are correct unless modified by attachments:

1. The Prime Bidder/Contractor has personally investigated proposed Product and determined that it meets or exceeds the function, appearance, sustainable design requirements, and quality level of the specified Product.
2. The same warranty will be provided for the Substitution as for the specified Product.
3. Installation will be coordinated with other Work, including the Work of separate Contractors, without additions to the total Contract Sum or Contract Time.
4. The Prime Bidder/Contractor will pay for changes to the building design if additional design or detailing is required to properly integrate the Substitution into the Work, and for additional services required to obtain the approval of governing authorities.

SUBMITTER:
(if other than Prime Bidder/Contractor)

_____
Name of Company or Corporation

_____
Phone

_____
email

By: _____
Signature

_____
Printed Name

PRIME BIDDER/CONTRACTOR:
(must be completed)

_____
Name of Company or Corporation

_____
Phone

_____
email

By: _____
Signature

_____
Printed Name

ARCHITECT'S RESPONSE:

___ Addendum or contract modification to be issued
___ Additional information needed
___ Not approved
___ Received too late

By: _____ Date: _____

Notes: _____

SECTION 01 7000 – EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Examination.
   2. Preparation.
   3. Field engineering.
   4. Execution.
   5. Progress cleaning.
   6. Construction waste management and disposal.
   7. Protecting installed construction.

B. Related Requirements:
   1. Section 01 7700 – Closeout Requirements: Final cleaning.

1.02 SUBMITTALS FOR INFORMATION: In accordance with Section 01 3300.

A. Construction Waste Management Plan: Identify material types and estimated quantities for recycling, reuse, or sorting. Describe separation requirements, on-site storage requirements, destinations and transportation methods for each type of material. For waste that cannot be recycled, identify disposal locations and methods.
   1. Provide copy of construction waste management plan to each worker, subcontractor, and supplier when they first begin work on site. Provide periodic training and enforcement as necessary.

1.03 EXAMINATION:

A. Verify that existing site conditions, field measurements, and substrate surfaces are acceptable for subsequent Work. Beginning new Work indicates acceptance of existing conditions.

B. Verify that existing substrate is capable of structural attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify that utility services are available, of the correct characteristics, and in the correct location.

1.04 PREPARATION:

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

1.05 FIELD ENGINEERING:

A. Locate and preserve survey control and reference points, and establish elevations, lines and levels, under the supervision of experienced engineering and surveying personnel utilizing recognized engineering survey practices.

B. Where existing survey control points are indicated on Drawings, verify locations prior to starting work. Protect and maintain survey control points at all times; preserve permanent reference points during construction.

C. Arrange for replacement of dislocated or destroyed survey control points, or relocation required by changes in grade or other reasons, based on original survey control. Permanent points removed or destroyed during progress of the Work shall be reinstalled at the expense of the party responsible for their removal.

D. Verify setbacks and easements; confirm Drawing dimensions and elevations.

E. Refer to Section 01 7700 for record survey requirements.

1.06 EXECUTION:

A. Install, erect, and apply Products in accordance with manufacturer's instructions and recommendations. In the event of conflict with requirements of the Contract Documents, request resolution in accordance with Section 01 3100.

B. Cutting and Patching:

1. Provide chases, openings, and recesses in new construction, where required by the work of each trade; provide and set in place all boxes, sleeves, inserts, and similar components.

2. Slabs, Walks, and Pavements: Saw cut existing materials to provide a neat joint at removal limits, except where removal terminates at an existing joint. Pin new concrete to existing with #5 bars, minimum 24 inches long, spaced at 18 inches o.c. and embedded minimum 12 inches into existing concrete.

3. Submit written request in advance of cutting or altering elements which may affect:
   a. Structural integrity of element.
   b. Integrity of weather-exposed or moisture-resistant elements.
   c. Efficiency, performance, maintenance, useful life, or safety of element.
   d. Visual qualities of elements exposed to view.
   e. Work of Owner or separate Contractor.

4. Execute cutting, fitting, and patching, including excavation and fill, to complete Work, and to:
   a. Fit the several parts together, to integrate with other Work.
   b. Uncover work to install or correct ill-timed Work.

c. Remove and replace defective and non-conforming Work.
d. Remove samples of installed Work for testing.
e. Provide openings in elements of Work for penetrations of facility services Work.

5. Execute work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

6. Minimize cutting and patching in construction with fire or smoke separation requirements, where shown on the Drawings. Execute work by methods which will not reduce fire ratings or permit passage of smoke.

7. Cut masonry and concrete materials using masonry saw or core drill.

8. Do not cut, notch, or bore holes in metal framing members without approval; utilize factory punch-outs or holes where present. Do not cut or notch flanges.

9. Restore Work with new Products in accordance with requirements of Contract Documents.

10. Refinish surfaces to match adjacent finishes in all respects, including color, size and texture. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

11. Identify hazardous substances and conditions exposed during the Work to the Architect for decision or remedy.

C. Above-Ceiling Work: Where suspended ceilings are installed before overhead work is complete, remove and protect ceiling panels as required for access to work areas. Use caution to avoid damage to ceiling grid. Reinstall ceiling panels when work is complete and tested. Coordinate and pay for repair or replacement of grid, panels, and related components damaged during performance of the work.

D. Items Removed for Reinstallation: Items removed which are to be relocated, reused, or reinstalled in existing locations, shall be stored on site in approved locations until progress of the work permits reinstallation. Protect stored items against damage.

1.07 PROGRESS CLEANING:

A. Maintain areas free of waste materials, debris, packaging materials, and rubbish. Maintain site in clean and orderly condition.

B. Clean dirt, debris, and mud from on-site locations as directed. Clean and wash down construction vehicles prior to leaving the site as required to minimize tracking of dirt, debris, and mud onto public roads. Clean dirt, debris, and mud from public roads as directed.

C. Remove debris and rubbish from pipe chases, plenums, shafts, trenches, manholes, and other limited access or remote spaces, prior to enclosing the space.

D. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust. Clean surfaces of installed products in accordance with manufacturer's instructions.

E. Collect non-hazardous waste materials, debris, packaging materials, and rubbish daily and place in dumpsters or approved locations for recycling or salvage.

F. Clean and organize work areas daily. Maintain cleanliness in all work areas to assist other Contractors, suppliers, and the Owner in the timely installation of equipment and implementation and completion of concurrent responsibilities.

1.08 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL:

A. Provide and maintain containers of adequate size to receive scrap construction materials, packaging and debris generated by performance of the work.
   1. Do not dispose of construction waste materials in trash receptacles or recycling containers designated for Owner's use.
   2. Do not allow waste materials to accumulate on site. Change out loaded containers for empty containers as demand requires.
   3. Remove and promptly dispose of contaminated or vermin infested materials.
   4. Post approved temporary signage at waste collection areas to assist workers in achieving waste management goals.

B. Recyclable and Recoverable Material: Materials may be separated, stored, protected, and handled at the project site, or transported off-site for separation. Arrange for regular collection, transport, and delivery to respective approved recycling centers to keep site clear and prevent contamination of materials.

C. Salvaged Materials: Temporarily store on site in approved locations, neatly stacked and arranged; remove from the Owner's property promptly. Salvaged material shall not be sold on site.

D. Hazardous Substances: Collect and remove from site daily, and dispose of off-site in a legal location and manner, all hazardous substances in aerosol cans, tubes, pails, buckets, barrels, canisters or other factory packaged containers. Do not dispose of hazardous substances on-site or in containers for materials to be recycled, salvaged, or disposed of in landfills.

1.09 PROTECTING INSTALLED CONSTRUCTION:

A. Protect equipment and materials from damage during installation. Replace or repair equipment, material or facilities damaged by the Contractor during, or due to, or in the performance of the Work, as directed by the Architect.

B. Protect installed Work; provide special protection where specified in individual specification sections.
   1. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.

2. At the end of each work day, protect all work likely to be damaged from weather, rain, wind, storms, frost, heat, and other causes of injury or damage.
3. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
4. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
5. Upon installation of finish materials and construction exposed to view, and where existing work and finish materials are not indicated to be removed or modified by the work of this project, protect such construction against damage or injury, using materials that may be easily removed without leaving residue or permanent stains.
6. During construction, cap, plug, or cover open ends of ducts, piping, and conduit, and equipment openings, to prevent entry of foreign material.

C. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, follow recommendations for protection from waterproofing or roofing material manufacturer.

D. Prohibit traffic from landscaped areas.

E. Properly and carefully repair materials and finishes which are cut, damaged, disturbed or interfered with to match adjacent and surrounding surfaces, to the approval of the Architect. If repairs cannot be made satisfactorily, replace or refinish with new materials.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 7700 – CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Final cleaning.
   2. Training and demonstration.
   3. Closeout procedures.
   4. Project record documents.
   5. Operation and maintenance.
   6. Warranties.
   7. Spare parts and maintenance materials.

B. Related Requirements:
   1. Section 01 3100 – Project Management and Coordination.
   2. Section 01 7000 – Execution Requirements: Progress cleaning.

1.02 FINAL CLEANING:

A. Execute final cleaning prior to final project assessment. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of work to the condition expected from a commercial cleaning and maintenance program. Comply with manufacturer's instructions.

B. Upon completion of the work, remove debris, tools, machines, construction equipment, and other items pertaining to the work.

C. The following are examples, but not by way of limitation, of cleaning levels required.
   1. Remove labels not required as permanent labels.
   2. Clean transparent and reflective materials, including glass (both sides) and mirrors, to a polished condition; remove vision-obscuring materials and substances. Replace broken glass and damaged materials. Restore reflective surfaces to original reflective condition.
   3. Clean exposed hard-surfaced materials to a dirt-free condition, free of dust, stains, films, and noticeable distracting substances.
   4. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces.
   5. Wipe surfaces of mechanical and electrical equipment clean; remove excess lubrication and other substances.
   6. Remove spatters or other deposits of paint, mortar, concrete, adhesives, roofing, dirt, soil, oil, or any other material foreign to the surface involved.
   7. Vacuum clean carpeted and soft surfaces.
   8. Clean plumbing fixtures to a sanitary condition, free of stains, including those resulting from water exposure.

9. Clean light fixtures to function with full efficiency.
10. Wet mop hard surface floors. Clean concrete floors in unfinished spaces broom clean.
11. Replace filters of operating equipment.
12. Clean debris from roofs, gutters, down pipes, and drainage systems.
13. Clean site areas affected by construction, including landscaped and developed areas, free from litter and foreign substances; sweep paved areas broom clean, remove stains, petrochemical spills, and other foreign deposits; rake clean ground surfaces not landscaped or paved, to a smooth, even textured surface.
14. Remove waste and surplus materials, rubbish, and construction facilities from the site; dispose of lawfully.

D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

E. Comply with governing regulations and safety standards for cleaning operations.

F. Additional cleaning required after final cleaning due to punch list work and warranty repairs shall be performed by the Contractor responsible for the additional work.

1.03 TRAINING AND DEMONSTRATION:

A. Where specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems and instruct Owner's personnel.

B. Training and demonstration sessions shall be held at the project site, or in suitable facilities elsewhere provided by the Owner. Online or distance learning is subject to Owner approval, and is limited to software, programming, and similar subject matter not requiring physical access to equipment.

C. Minimum two weeks in advance of each training session, submit the following to the Architect for Owner's approval:
1. Preliminary schedule listing dates and times for each session. Owner will provide list of personnel to receive instructions, and will coordinate their attendance at the approved times.
2. List of personnel providing training, including a summary of credentials and experience for each presenter.
3. Outline syllabus of training sessions, including list of topics and approximate time allocations.
4. Completed operation and maintenance manuals for the applicable equipment or system. Owner will make these available for reference during training sessions.
5. Certification that equipment or system has been inspected and is fully operational, and all specified testing, adjusting and balancing has been performed.

D. Where the number of hours of training is specified, this is a minimum requirement unless waived or reduced by the Owner, and shall be extended if necessary for

adequate coverage of the subject matter in accordance with the approved syllabus and specified requirements.

1. Initial training and demonstration must be completed prior to Substantial Completion. For equipment requiring seasonal operation, a portion of the training and demonstration may be delayed up to 6 months subject to Owner's approval.
2. With Owner approval, training may be suspended prior to completion of the specified number of hours, with the remaining hours available on Owner request up to one year after Substantial Completion or throughout the warranty period, whichever is longer.

E. Use operation and maintenance manuals as the basis of instruction; review contents with personnel in full detail. Prepare and insert additional data in manuals when need for additional data becomes apparent during instructions. Provide all materials required for instruction.

F. Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each major component or subsystem as applicable.

G. Record training and demonstration sessions, and provide minimum two copies to Owner on digital media in approved video format. Label and organize media for convenient storage and reference.

H. Within one week after completion, submit report listing date and time of each session, number of hours, and name of each person in attendance.

1.04 CLOSEOUT PROCEDURES:

A. At Substantial Completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents (except for punch list items attached to certification) and ready for Architect's review.

B. Submit the following to Architect prior to applying for final payment.

1. Reports of training and demonstration sessions in accordance with this Section.
2. Closeout documentation in accordance with this Section, including project record documents, operation and maintenance data, and warranties.
3. Receipt signed by Owner, acknowledging delivery of spare parts and maintenance materials. List specific items and quantities.
4. Copy of Certificate of Plan Approval, Certificate of Occupancy, and other required regulatory approvals, with signatures of all inspectors. Originals shall remain on site; obtain receipt from Owner.
5. Affidavit of Payment of Debts and Claims (00 6520).
6. Final Waiver of Lien from each subcontractor.
7. Certificates of Insurance indicating that required insurance coverage will remain in effect until the end of the correction period.

1.05 PROJECT RECORD DOCUMENTS:

A. Maintain one set of the following record documents on site; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed submittals including shop drawings and product data.
   6. Manufacturer's instructions for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction. Label each document "Project Record Documents" in stamped or printed letters, on front cover or other conspicuous place.

D. Record information concurrent with construction progress, before internal or hidden construction is concealed.

E. Make documents available to Architect at all times.

F. Record Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
   1. Manufacturer's name, product model and number, and supplier.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

G. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish floor datum.
   2. Measured horizontal and vertical location of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Changes made by Addenda and modifications.
   5. Field changes of dimension and detail.
   6. Details not on original Contract drawings.

H. Record Submittals: Approved product data and manufacturer's installation instructions, marked to record field changes.

I. Remove Architect title block and seal from all documents.

J. Submit to Architect prior to or together with final Application for Payment.

K. Record Survey: Contractor responsible for final grading shall provide a site survey by a licensed surveyor, showing as-built elevations for each new elevation point indicated on the Drawings.
   1. The survey shall utilize the same bench mark indicated on the Drawings.

2. Include pipe elevations at all structures; locate pipe with respect to control lines indicated on Drawings.
3. Submit survey in Autocad format, and 3 prints of each sheet signed and sealed by the Surveyor.

1.06 OPERATION AND MAINTENANCE:

A. General Requirements:

1. Submit to Architect for review; allow sufficient time for review and revision prior to final Application for Payment. Upon approval, submit final copies to Owner and Architect.

2. Submittals to Architect and Owner shall be in electronic format. At Owner's option, also submit up to two hard copy sets.

3. Electronic Submittals: Data submitted in electronic format shall be limited to PDF files on DVD or USB drive, unless otherwise approved in advance by Architect.

4. Hard Copy Submittals:
   a. Submit data bound in 8½ x 11 inch format, organized in three-ring binders with durable rigid covers. Provide multiple volumes where appropriate; organized and labeled in a coordinated set with matching appearance.
   b. Prepare binder cover with printed title of manual and title of project. Identify subject matter of binder on cover and spine.
   c. Include a Table of Contents for each volume.
   d. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titles clearly printed under reinforced plastic tabs.

B. Operation and Maintenance Manuals:

1. Directory: List names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, suppliers, and maintenance providers.

2. Operation and Maintenance Instructions: Arrange by system and subdivide by specification section. For each category, identify the following as applicable to the Product or system:
   a. Significant design criteria.
   b. List of products, clearly identifying specific product or part installed, with options and accessory items indicated.
   c. Schematic drawings, wiring diagrams, and flow diagrams for each system, with parts list for each component.
   d. Step-by-step procedures for start-up, seasonal changeover, and shut-down of each system and piece of equipment.
   e. Operating instructions.
   f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

g. Maintenance instructions for equipment and systems, including lubrication and filter replacement requirements, recommended service intervals, and troubleshooting procedures.
h. Information required for reordering specially manufactured products.

3. Project Documents and Certificates: Include the following:
   a. Test reports for each item with specified field or laboratory testing.
   b. Warranty documents in accordance with this Section. Indicate names, addresses, telephone numbers, and procedures for filing a claim and obtaining warranty services.
   c. Sprinkler installer's material and test certificate.
   d. HVAC testing and balancing reports.

C. Maintenance Service: Where specified in individual specification sections, perform maintenance services for the time period specified beginning from the date of Substantial Completion, or from the date of warranty commencement, whichever is later.

1. Perform on-site inspections at the specified frequency, but not less than one per year.
2. Use competent and qualified personnel under the supervision and in the direct employ of the service provider, and trained and authorized by the manufacturer.
3. Perform work without removing system from service, when possible. If outages are required, coordinate scheduling in advance with Owner to avoid peak usage periods.
4. Include systematic examination, adjustment, and lubrication of system components; maintain fluid levels. Repair or replace parts whenever required, using parts and supplies produced or recommended by the manufacturer.
5. Provide reports to Owner and Architect, indicating system conditions and services performed.

1.07 WARRANTIES:

A. General Requirements:
   1. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on Work that incorporates products.
   2. Include in Operation and Maintenance Manuals.
   3. For items of Work delayed beyond date of Substantial Completion, provide updated submittal prior to or together with final Application for Payment, listing date of actual completion as start of warranty period.
   4. Written warranties made to Owner are in addition to contractual, implied, and expressed warranties, and shall not limit duties, obligations, rights and remedies otherwise required by Contract Documents and available under law.

5. Warranty claims shall be resolved in the same venue and using the same dispute resolution method as provided for the Prime Contract.

B. Contractor's Warranty: Contractor shall provide warranties, and shall correct nonconforming Work, in accordance with the General Conditions.

C. Specific Warranties: Provide written documentation for each warranty specified in individual specification sections.
   1. At the time of shop drawing and product data submittal, submit a preliminary copy of each specific warranty for review in accordance with Section 01 3300.
   2. Provide full warranty for parts and labor, without dollar amount limitation or proration based on period of use, unless specifically indicated in individual specification sections.
   3. Warranty periods begin on the Date of Substantial Completion, unless specifically indicated in individual specification sections. Where manufacturer warranties begin at an earlier date, such as the date of shipment or installation, coordinate procurement and scheduling so that specified warranty periods are not compromised. Provide extended warranty coverage where necessary.
      a. In the event that items of Work covered by a warranty have punch list work remaining on the Date of Substantial Completion, the warranty period shall not begin until all such work is complete.
   4. Where Warranties from Subcontractors, suppliers or manufacturers are limited to material only, Contractor shall include warranty coverage for labor, shipping, equipment, and other costs required to remove defective Work and install replacement materials.
   5. Warranty provisions requiring Owner to provide notice to manufacturer shall allow a minimum time period of 30 days for such notice.
   6. If the terms of a warranty require Owner signature, registration, or other action prior to commencement of warranty coverage, Contractor shall take all necessary steps to ensure validity of the warranty, and shall indemnify Owner for loss of warranty coverage caused by failure to do so.

D. Manufacturer Warranties: Where a manufacturer provides a standard product warranty that exceeds the duration of the Contractor's warranty or a Specific Warranty, Contractor shall take all necessary actions to ensure that the manufacturer warranty remains in effect beyond the expiration of the shorter warranty periods.

1.08 SPARE PARTS AND MAINTENANCE MATERIALS:

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.

B. Extra materials shall be from the same lot as installed materials.

C. Provide protective covering for storage; identify with appropriate labels.

D. Deliver to project site and place in location as directed.

E. Extra materials required may include, but are not limited to, the following:
   1. Section 09 3013 – Ceramic Tiling.
   2. Section 09 5100 – Acoustical Ceilings.
   3. Section 09 6500 – Resilient Flooring.
   4. Section 09 6800 – Carpeting.
   5. Section 09 9000 – Painting and Coating.
   6. Section 10 2800 – Toilet and Bath Accessories.
   7. Section 12 3000 – Casework: Hardware.
   8. Division 21 – Fire Suppression: Sprinkler heads.
   9. Division 22 – Plumbing: Faucets.
   10. Division 23 – Heating, Ventilating, and Air Conditioning: Filters.
   11. Division 26 – Electrical: Light fixtures.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 03 1000 – CONCRETE FORMING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Concrete forming and accessories.

B. Related Sections:
   1. Section 03 3000 – Cast-in-Place Concrete.
   2. Section 05 3113 – Steel Floor Decking.
   3. Section 05 5100 – Metal Stairs.
   4. Section 07 1700 – Bentonite Waterproofing.
   5. Section 07 2100 – Thermal Insulation: Insulation for foundations and floor slabs.
   6. Section 33 4113 – Foundation Drainage.

1.02 QUALITY ASSURANCE:

A. Perform concrete work in accordance with ACI 301. Maintain one copy on site.

B. Perform formwork in accordance with ACI 347.

PART 2 PRODUCTS

2.01 FORMING MATERIALS:

A. Wood Form Materials:
   1. Plywood for Surfaces Exposed to View: APA High Density Overlay Plyform Class I Exterior, thickness in accordance with APA V345; sound undamaged sheets with clean, true edges.
   2. Plywood for Surfaces Not Exposed to View: APA B-B Plyform Class I Exterior, thickness in accordance with APA V345; sound undamaged sheets with clean, true edges.
   3. Lumber: Kiln dried softwood; grade as required for loading conditions.

B. Prefabricated Forms: Preformed steel or glass fiber reinforced plastic; matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

C. Permanent Forms: Metal deck, minimum 26 gauge; preservative treated plywood, minimum ½ inch; or other materials of equivalent durability and loadbearing capacity.

2.02 FORMING ACCESSORIES:

A. Form Ties: Metal snap-off type, free of defects that could leave holes larger than 1 inch in concrete surface.

B. Form Release Agent: Colorless mineral oil which will not stain concrete, absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.

1. Manufacturers: In accordance with Section 01 6000.
   a. Euclid Chemical Company; Eucoslip VOX.
   b. Laticrete International; Debond Form Coating.
   c. W. R. Meadows, Inc.; Duogard.
   d. Sonneborn Building Products; Cast-Off WB.
2. VOC Content: Maximum 340 g/L.

C. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

D. Waterstops: Polyvinyl chloride (PVC), minimum 1750 psi tensile strength, minimum 50 degrees F to 175 degrees F working temperature range, 6 inch wide, 3/8 inch web thickness, maximum possible lengths, split type with ribbed profile and center bulb, preformed corner sections, heat welded jointing.

1. Manufacturers: In accordance with Section 01 6000.
   a. Sika Corporation; Greenstreak No. 724.
   b. Paul Murphy Plastics Company; SR-6380.
   c. Vinylex Corporation; RSB6-38.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify lines, levels, and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 PREPARATION:

A. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3.03 FORMING:

A. Formwork Erection: Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
   1. Earth forms are permitted only at footings and grade beams excavated from undisturbed soil, where soil conditions are sufficiently stable to eliminate the possibility of slide-in. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.
   2. Construct formwork so that concrete members are of the correct size, shape, alignment, elevation, and position.
   3. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

4. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
5. Align joints and make watertight. Keep form joints to a minimum.
6. Obtain approval before framing openings in structural members which are not indicated on Drawings.
7. Install permanent forms for air slabs as shown on Drawings to provide minimum 3 inch void space between form and subgrade. Protect forms from crushing or collapse.
8. Coordinate formwork erection with work of other sections requiring attachment of components to formwork.
9. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

B. Application of Form Release Agent:
1. Apply form release agent on formwork in accordance with manufacturer's recommendations.
2. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
3. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

C. Inserts, Embedded Parts, and Openings:
1. Provide formed openings where required for items to be embedded in or passing through concrete work.
2. Locate and set in place items which will be cast directly into concrete.
3. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, raceways, conduits, ducts, other inserts, and components of other Work.
4. Install accessories in accordance with manufacturer's instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.
5. Install waterstops in accordance with manufacturer's instructions continuous without displacing reinforcement. Seal joints watertight.
6. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow drainage.
7. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted to joints which will not be apparent in exposed concrete surfaces.

D. Form Cleaning:
1. Clean forms as erection proceeds, to remove foreign matter within forms.
2. Clean formed cavities of debris prior to placing concrete.
3. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
4. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete

construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

E. Formwork Tolerances: ACI 301.
   1. Elevator Hoistways: Construct and align formwork in accordance with ASME A17.1.

F. Form Removal:
   1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
   2. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
   3. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

3.04 FIELD QUALITY CONTROL:

A. 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.

END OF SECTION

SECTION 03 3000 – CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Cast-in-place concrete construction:
      a. Footings and foundation walls.
      b. Floors and slabs on grade.
      c. Supported slabs.
      d. Control, expansion, and contraction joint devices associated with concrete work, including joint sealants.
      e. Equipment pads.
      f. Bases for light poles and similar items.
   2. Concrete reinforcing.
   3. Concrete curing.

B. Products Installed But Not Furnished Under This Section:
   1. Section 05 1200 – Structural Steel Framing: Anchor rods.
   2. Section 05 5200 – Metal Railings: Metal anchors.
   3. Section 10 1453 – Traffic Signage: Sign posts.
   4. Divisions 21 through 28: Facility Services items for casting into concrete.

C. Related Requirements:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 03 1000 – Concrete Forming.
   3. Section 03 3500 – Concrete Finishing.
   4. Section 04 0500 – Common Work Results for Masonry: Grout for base plates and bearing plates.
   5. Section 05 3113 – Steel Floor Decking.
   6. Section 05 5100 – Metal Stairs.
   7. Section 07 1700 – Bentonite Waterproofing: Preparing concrete surfaces to receive waterproofing.
   8. Section 07 2100 – Thermal Insulation: Insulation for foundations and floor slabs.
   9. Division 32 – Site Improvements: Concrete paving.
   10. Section 33 4113 – Foundation Drainage.

1.02 COORDINATION: In accordance with Section 01 3100.

A. When concrete footings, piers, and walls have attained 75 percent of the minimum compressive design strength, provide written notification to the structural steel erector.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings:
   1. Reinforcing: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.
   2. Joint Layout: Indicate layouts and joint locations for slabs and sidewalks. Indicate locations of construction joints.

B. Product Data: Provide data on concrete mix designs, joint devices, attachment accessories, vapor retarders, and admixtures.

1.04 QUALITY ASSURANCE:

A. Perform concrete work in accordance with ACI 301.

B. Perform steel reinforcement in accordance with ACI SP-66 and CRSI Manual of Standard Practice, Placing Reinforcing Bars, and Reinforcing Bars: Anchorages and Splices.

C. Acquire cement and aggregate from same source for all work.

1.05 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver packaged materials in manufacturer's packaging including application instructions.

B. Store reinforcing off the ground, supported to prevent sags, protected from weather exposure, with provisions for air circulation.

1.06 ENVIRONMENTAL REQUIREMENTS:

A. Conform to ACI 305R when concreting during hot weather. Provide precautions against plastic shrinkage where indicated by air temperature, relative humidity, concrete temperature, and wind velocity.

B. Conform to ACI 306.1 and ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 REINFORCING:

A. Reinforcing Steel: ASTM A615, Grade 60; deformed billet steel bars, unfinished.

B. Welded Wire Reinforcement: ASTM A1064, Grade 65, Plain Type; in flat sheets; unfinished.

C. Tie Wire: Minimum 16.5 gauge, black annealed.

D. Chairs, Bolsters, Bar Supports, Spacers: CRSI RB4.1; sized and shaped for strength and support of reinforcement during concrete placement conditions, including load bearing pad on bottom to prevent vapor retarder puncture. Metal accessories shall be

galvanized. At weather exposed concrete locations, steel materials shall be plastic coated.

2.02 REINFORCING FABRICATION:

A. Fabricate concrete reinforcing in accordance with ASTM A184, CRSI Manual of Standard Practice, ACI 318, and ACI SP-66. Weld reinforcing bars in accordance with AWS D1.4 Welding Code.

B. Locate reinforcing splices not indicated on drawings, at point of minimum stress.

C. Remove rust scale and coatings, including form release agents, which may reduce bond from reinforcing prior to fabrication.

D. Cold bend reinforcing bars to minimum bend diameters in accordance with ACI 301. Fabricate hooks as ACI standard hooks.

E. Extend horizontal bars in walls and footings minimum 38 bar diameters and minimum 18 inches around corners or into abutting concrete, or provide bent bars of equal size, spacing, and embedment.

F. At corners and reentrant corners of wall and slab openings, unless typical reinforcing exceeds this requirement, provide one #5 bar in each face parallel to each edge and extending minimum 24 inches past the edge of the opening.

2.03 CONCRETE MATERIALS:

A. Cementitious Materials:

1. Portland Cement: ASTM C150, Type I – Normal.

2. Portland-Limestone Cement: ASTM C595, Type IL; maximum 15 percent limestone content.

3. Fly Ash: ASTM C618; Type C or Type F.
   a. Interior Concrete Slabs: Fly ash may be substituted for up to 15 percent of the cement content for each concrete mix.
   b. Other Locations: Fly ash may be substituted for up to 25 percent of the cement content for each concrete mix.

4. Slag Cement: ASTM C989, Grade 100 minimum. Slag cement may be substituted for up to 35 percent of the cement content for each concrete mix.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: ASTM C1602; clean, potable and not detrimental to concrete.

2.04 ADMIXTURES:

A. Manufacturers: In accordance with Section 01 6000. Admixtures shall be the products of a single manufacturer.
   1. GCP Applied Technologies.

2. Master Builders Solutions.
3. Premiere Concrete Admixtures.
4. Sika Corporation.

B. Air Entrainment: ASTM C260, neutralized vinsol resin.

C. Chemical: ASTM C494.
1. Type A – Water Reducing.
2. Type B – Retarding.
3. Type C – Accelerating.
4. Type D – Water Reducing and Retarding.
5. Type E – Water Reducing and Accelerating.

D. Plasticizing: ASTM C1017.

E. Admixtures containing more than 0.1 percent chloride ions are not approved.

2.05 ACCESSORIES:

A. Vapor Retarder: ASTM E1745, Class B; minimum 10 mil thickness.
1. Water Vapor Permeance: ASTM E154; maximum 0.025 perms.

B. Bonding Agent: Polymer resin emulsion.
1. Manufacturers: In accordance with Section 01 6000.
a. GCP Applied Technologies; Daraweld-C.
b. Master Builders Solutions; MasterEmaco A660.
c. Sika Corporation; Sika Bond.

2.06 JOINT DEVICES AND FILLER MATERIALS:

A. Joint Filler: One of the following at Contractor's option; ½ inch thick.
1. ASTM D994 or ASTM D1751; asphalt impregnated fiberboard or felt.
2. ASTM D4819; closed cell polyethylene.
3. ASTM D8139; closed cell polypropylene.

B. Bond Breaker: No. 15 asphalt saturated felt.

C. Construction Joint Devices: Galvanized steel with mill finish, minimum 20 gauge; 8 inch thick, formed to tongue and groove profile, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.
1. Manufacturers: In accordance with Section 01 6000.
a. Heckmann Building Products, No. 95.

D. Joint Sealant: ASTM C920 Type M, Grade P, Class 25, Use T; cold applied two part polyurethane, self leveling; with corresponding primer.
1. Manufacturers: In accordance with Section 01 6000.
a. Master Builders Solutions; MasterSeal SL 2.
b. Quaker Sealants & Coatings Company; QSC-231.
c. Sika Corporation; Sikaflex-2c SL.
d. Tremco, Inc.; THC 901.

2.07 CONCRETE MIXES:

A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94. Do not mix concrete more than 90 minutes.

B. Select proportions for normal weight concrete in accordance with ACI 301, field experience or trial batch methods.

C. Provide concrete to the following criteria:

1. Exterior Concrete, and Concrete Exposed to Weather:
   a. Compressive Strength (28 day): Minimum 4500 psi.
   b. Air Entrained: 4½ to 7½ percent.

2. Foundation Walls:
   a. Compressive Strength (28 day): Minimum 4000 psi.
   b. Air Entrained: 4½ to 7½ percent.

3. Concrete Fill for Overexcavated Areas and Utility Trench Backfilling:
   a. Compressive Strength (28 day): Minimum 1500 psi.
   b. Aggregate Size (maximum): ½ inch.
   c. Slump (maximum): 6 inches.

4. Footings and Interior Foundations:
   a. Compressive Strength (28 day): Minimum 3500 psi.
   b. Aggregate Size (maximum): 1½ inch.

5. Interior Formed Concrete:
   a. Compressive Strength (28 day): Minimum 4000 psi.
   b. Aggregate Size (maximum): 1½ inch.

6. Concrete Fill for Metal Pan Stairs:
   a. Compressive Strength (28 day): Minimum 2500 psi.
   b. Aggregate Size (maximum): ½ inch.

7. Interior Supported Concrete Slabs:
   a. Compressive Strength (28 day): Minimum 3500 psi.
   b. Aggregate Size (maximum): 1/3 depth of slab, maximum 1 inch.

8. Interior Concrete Slabs on Grade, and Concrete Work Not Otherwise Scheduled:
   a. Compressive Strength (28 day): Minimum 3500 psi.
   b. Aggregate Size (maximum): 1 inch.

D. Slump (plus or minus 1 inch): 3 inches, unless noted otherwise.

E. Maximum Size of Coarse Aggregate: In accordance with ACI 301 unless noted otherwise.

F. Use accelerating admixtures in cold weather only when approved by Architect. Use of admixtures will not relax cold weather placement requirements.

G. The use of calcium chloride is not permitted.

H. Use set retarding admixtures during hot weather only when approved by Architect.

I. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

J. Air entrainment at floor slabs scheduled to receive floor sealer shall not exceed 3%.

K. Water may be added one time to ready-mixed concrete at the point of delivery in accordance with ASTM C94, provided the specified slump and water/cement ratio are not exceeded. Measure slump before and after addition of water. Do not add water to concrete containing plasticizing or water reducing admixtures.

2.08 CURING MATERIALS:

A. Liquid Membrane Curing Compound: ASTM C309, Type I, Class B; dissipating type. Clean thoroughly with power scrubber and industrial strength detergents prior to installing floor coverings.

1. Manufacturers: In accordance with Section 01 6000.
   a. Euclid Chemical Co.; Kurez DR VOX.
   b. Laticrete International.
   c. Tamms Industries.
   d. W. R. Meadows, Inc.

B. Absorptive Mats: ASTM C171, burlap-polyethylene, minimum 8 oz/sq yd, or reinforced water-resistant laminated paper, bonded to prevent separation during handling and placing.

C. Water: Potable, not detrimental to concrete.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

B. Verify that underslab construction, including facility services work, is installed complete, backfilled, inspected, and approved.

3.02 PREPARATION:

A. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

B. Coordinate floor slab elevations, hold downs, and transition locations with finish flooring materials scheduled.

C. Coordinate floor drain elevations with plumbing installer to provide ¼ inch per foot slope to drain; maintain slab thickness.

3.03 PLACING REINFORCING:

A. Verify that reinforcing is free of dirt and form release agents.

B. Place, support, and secure reinforcement against displacement. Do not deviate from required position.

C. Splice reinforcing bars in accordance with ACI 318. Mechanical splice couplers may be used upon submittal of manufacturer's data.

D. Place welded wire fabric in maximum lengths. Lap adjacent sheets minimum one full space plus 2 inches; secure lapped edges together at maximum 48 inches o.c. Hold fabric back minimum 2 inches from construction joints.

E. Do not displace or damage vapor retarder.

F. Accommodate placement of formed openings.

G. Maintain concrete cover around reinforcing in accordance with ACI 318.

H. Maintain clear distance between reinforcing bars, minimum 1 inch and 1-1/3 times the maximum coarse aggregate size.

I. Tolerances: In accordance with ACI 117.

3.04 PLACING CONCRETE:

A. Place concrete in accordance with ACI 301.

B. Notify Architect minimum 48 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, and joint devices are not disturbed during concrete placement.

D. Install vapor retarder under interior slabs on grade, in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by taping edges and ends.

   1. Seal overlapping joints, perimeter joints, openings and penetrations with continuous strip of vapor retarder tape. Seal perimeter to adjoining construction. Seal joints airtight at penetrations.

E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.

F. Place slabs on grade and sidewalks in pattern indicated and as approved by Architect.

   1. Separate slabs from vertical surfaces with ½ inch thick joint filler.
      a. Place joint filler in slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
      b. Extend joint filler from bottom of slab to within ½ inch of finished slab surface.

2. Provide expansion joints with ½ inch thick joint filler at maximum 20 ft o.c. both ways in exterior sidewalks. Align joints with joints in adjacent curbs.
   a. Place joint filler in slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
   b. Extend joint filler from bottom of slab to within ½ inch of finished slab surface.
3. Provide control joints in slabs at maximum 12'-6" o.c. unless indicated otherwise, in curbs at maximum 10 ft o.c., and in exterior sidewalks to subdivide concrete into areas of minimum 16 sq ft and maximum 36 sq ft, or as detailed.
   a. Control joints in slabs and walks shall form rectangular sections with a maximum aspect ratio of 1.5 to 1.
   b. Control joints may be tooled or saw cut at Contractor's option, and shall be minimum ¼ of the concrete thickness.
   c. Saw cut joints with 3/16 inch thick blade within 24 hours after placing, as soon as the saw blade can cut the concrete without displacing aggregate.
4. Install construction joint devices in coordination with slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete. Thicken slab to full depth of construction joint device.
5. Place concrete continuously between predetermined expansion and construction joints.
   a. Install waterstops in construction joints located in foundation walls and footings.
6. Apply sealant to exposed exterior and interior joints.

G. Do not interrupt successive placement. Do not permit cold joints to occur. Do not permit horizontal joints in walls or piers.

H. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

I. Provide mechanical equipment for conveying concrete to assure a continuous flow of concrete at the delivery end. Provide runways for wheeled concrete conveying equipment from the concrete delivery point to the locations of final deposit. Keep interior surfaces of conveying equipment, including chutes, free of hardened concrete, debris, water, snow, ice, and other deleterious materials.

J. Cold Weather Placing: Do not use frozen materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials. Ascertain that forms, reinforcing steel, and adjacent concrete surfaces are entirely free of frost, snow, and ice before placing concrete.

K. Remove excess and unsuitable concrete from project site and dispose of in an acceptable location.

3.05 CURING AND PROTECTION:

A. Cure concrete surfaces in accordance with ACI 308.

B. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, excessive temperature changes, and mechanical injury.

C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

D. Schedule of Curing Methods:
   1. Cure horizontal surfaces by ponding, spraying, absorptive mat, or membrane curing compound.
   2. Cure vertical surfaces by spraying or membrane curing compound.

E. Concrete Curing:
   1. Ponding: Maintain 100 percent coverage of water over floor slab areas continuously for 4 days.
   2. Spraying: Spray water over surfaces and maintain wet for 7 days.
   3. Absorptive Mat: Saturate material and place over floor slab areas, lapping ends and sides; maintain in place for 7 days.
   4. Membrane Curing Compound: Apply curing compound in accordance with manufacturer's instructions in two coats with second coat applied at right angles to first.

F. Protect finished concrete surfaces from damage by subsequent construction operations.

G. Do not permit traffic over unprotected surfaces.

3.06 FIELD QUALITY CONTROL:

A. Testing firm will perform concrete testing in accordance with Section 01 4520.
   1. Provide free access to Work and cooperate with testing firm.
   2. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of Work.
   3. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements. Repair or replacement of defective concrete will be determined by the Architect.

3.07 PATCHING:

A. Allow Architect to inspect concrete surfaces upon removal of forms.

B. Excessive honeycomb, voids over ½ inch diameter, or embedded debris in concrete is not acceptable. Notify Architect upon discovery.

C. Patch imperfections and tie holes in concealed surfaces in accordance with ACI 301.

D. Patch, fill, touch-up, and repair surface defects as directed by Architect for each individual area.
   1. Repair exposed concrete surfaces containing defects which adversely affect the appearance of the finish. Remove and replace the concrete having defective surfaces if the defects cannot be repaired to the satisfaction of the Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, holes left by tie rods and bolts, fins and other projections on the surface, stains, and other discolorations that cannot be removed by cleaning.
   2. Repair concrete surfaces containing defects which may adversely affect the durability of the concrete. Remove and replace the concrete having defective surfaces if the defects cannot be repaired to the satisfaction of the Architect. Surface defects include cracks in excess of 0.01 inch wide, cracks of any width and other surface deficiencies which penetrate to the reinforcement or completely through non-reinforced sections, crazing, honeycomb, rock pockets, and spalls, except minor breakage at corners.

END OF SECTION

SECTION 03 3500 – CONCRETE FINISHING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Concrete finishing.

B. Related Requirements:
   1. Section 03 3000 – Cast-in-Place Concrete.

1.02 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver packaged materials in manufacturer's packaging including application instructions.

1.03 ENVIRONMENTAL REQUIREMENTS:

A. During concrete floor finishing, provide temporary heat to maintain ambient temperature of minimum 50 degrees F; provide ventilation sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

PART 2 PRODUCTS

2.01 FINISHING MATERIALS:

A. Sealer: ASTM C309, Type 1; clear acrylic sealer and hardener.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Sika Corporation; Sikafloor ProSeal 90.
      b. Sealed Air Corporation; JonCrete High Gloss Sealer.
      c. W. R. Meadows; Vocomp-25.

PART 3 EXECUTION

3.01 CONCRETE FINISHING:

A. Provide concrete surfaces with finishes in accordance with the definitions in ACI 301. Finish concrete flatwork surfaces in accordance with ACI 301 and ACI 302.
   1. Trenches, Pits, and Concealed Formed Concrete: Rough form finish.
   2. Exposed Formed Concrete: Smooth form finish.
   3. Light Pole Bases: Smooth rubbed finish.
   4. Interior Slabs Scheduled to Receive Tile with Full Bed Setting System: Floated finish.
      a. Where cleavage membrane or waterproofing membrane is scheduled, provide troweled finish.
   5. Interior Slabs Scheduled to Receive Thinset Tile: Troweled finish with fine broom finish.
      a. Where membrane is scheduled, provide troweled finish.

6. Interior Slabs Not Otherwise Scheduled: Troweled finish. Apply sealer where exposed.
7. Exterior Slabs and Sidewalks: Broom finish.
8. Exterior Equipment Pads: Troweled finish.

B. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at ¼ inch per ft.

C. Tool exposed slab edges, expansion joints, and tooled control joints with ¼ inch radius edging tool.

D. Floor Sealer: Apply on floor surfaces as scheduled in accordance with manufacturer's instructions.

3.02 FLOOR FINISHING TOLERANCES:

A. Maximum Variation of Surface Flatness: ¼ inch in 10 ft, ACI 301 Class B.

B. Correct defects by grinding or removal and replacement of the defective work. Re-measure corrected areas by the same process.

END OF SECTION

SECTION 04 0500 – COMMON WORK RESULTS FOR MASONRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Mortar and grout for masonry.
   2. Reinforcement, anchorage, flashings and accessories for masonry.
   3. Non-shrink grout for setting base plates.

B. Related Requirements:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary heat.
   2. Section 03 3000 – Cast-in-Place Concrete.
   3. Section 04 2000 – Unit Masonry.
   4. Section 04 7200 – Cast Stone Masonry.
   5. Section 05 1200 – Structural Steel Framing.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit for each type of reinforcing, anchorage, flashing, and accessory product.

B. Samples: Submit two samples of mortar, illustrating mortar color and color range.

1.03 REGULATORY REQUIREMENTS:

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

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Store bulk materials and aggregates to prevent deterioration or intrusion of foreign material. Remove unsuitable materials from the job site.
   1. When air temperature is below 40 degrees F, cover with plastic or canvas to prevent wetting and freezing.

B. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.05 FIELD CONDITIONS:

A. Cold Weather Construction (below 40 degrees F): Follow MIC Hot & Cold Weather Masonry Construction.
   1. Below 40 Degrees F: Heat mixing water and maintain mortar temperature between 40 and 120 degrees F until placed. Cover construction with plastic or canvas for 24 hours after laying masonry units; prevent wetting and freezing.
   2. Below 32 Degrees F: Heat sand and mixing water and maintain mortar temperature between 40 and 120 degrees F until placed. Thaw frozen materials prior to use.

Provide enclosures and temporary heat, or insulated blankets, to maintain masonry above 32 degrees F for 24 hours after laying masonry units.

3. Below 20 Degrees F: In addition to above, heat masonry units to 20 degrees F before placing. Provide enclosures and temporary heat to maintain masonry and air temperature within enclosure above 32 degrees F for 24 hours after laying masonry units.

B. Hot Weather Construction (above 90 degrees F): Follow MIC Hot & Cold Weather Masonry Construction.
   1. Store materials in cool or shaded areas. Limit open mortar beds to maximum 4 foot length; set units within one minute of spreading mortar. Protect wall from rapid evaporation by covering, fogging, damp curing or other approved means.

PART 2 PRODUCTS

2.01 MORTAR MATERIALS:

A. Portland Cement: ASTM C150, Type I, gray color.
   1. When air temperature is below 40 degrees F, use ASTM C150, Type III.

B. Masonry Cement: ASTM C91 or ASTM C1329; Type as required for mortar mix scheduled, gray color.

C. Mortar Aggregate: ASTM C144, standard masonry type.

D. Hydrated Lime: ASTM C207, Type S.

E. Quicklime: ASTM C5, non-hydraulic type.

F. Water: Clean and potable.

G. Bonding Agent: Internally plasticized, high polymer resin.
   1. Manufacturers: In accordance with Section 01 6000.
      a. GCP Applied Technologies; Daraweld-C.
      b. Dayton Superior Corp.
      c. W. R. Bonsal Co.

H. Water Repellent Admixture: ASTM C1384; integral liquid polymeric admixture to provide resistance to water penetration.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Acme-Hardesty Co.; Acme Shield.
      b. Euclid Chemical Co.; Hydrapel.
      c. GCP Applied Technologies; Dry-Block Mortar Admixture.
      d. Krete Industries, Inc.; Krete Gard 390.
      e. Master Builders Solutions; MasterPel 240MA.
      f. Sika Corp.; Sikamix W-10M.

I. Other Admixtures: Calcium chloride and other admixtures shall not be used.

2.02 MORTAR COLOR:

A. Manufacturers: In accordance with Section 01 6000.
   1. Cemex; Richcolor.
   2. Euclid Chemical Co.; Concentrated Mortar Colors.
   3. Fairborn Cement Co.; Miamicolor.
   4. Lehigh Cement Company.
   5. Solomon Colors, Inc.
   6. UPCO Company; Hydroment.
   7. York Building Products; Workrite.

B. Pigment: Mineral oxide, not exceeding 10 percent of portland cement by weight.

C. Color: As selected.

D. Schedule: Use colored mortar at exposed cast stone.

2.03 MORTAR MIXES:

A. Mortar for Foundation Walls and Masonry in Contact with Earth: ASTM C270, Type M using the Property specification.

B. Mortar for Load Bearing and Non-Load Bearing Walls: ASTM C270, Type S using the Property specification.

C. Mortar for Cast Stone: ASTM C270, Type N using the Property specification, with water repellent admixture added to the mix at a rate prescribed by the manufacturer.

2.04 MORTAR MIXING:

A. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

D. Do not use anti-freeze compounds to lower the freezing point of mortar.

E. If water is lost by evaporation, re-temper only within two hours of mixing.

F. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

2.05 GROUT MATERIALS:

A. Cementitious Materials:
   1. Portland Cement: ASTM C150, Type I – Normal.
   2. Fly Ash: ASTM C618; Type C or Type F. Fly ash may be substituted for up to 25 percent of the total cement content for each mix.

B. Hydrated Lime: ASTM C207, Type S.

C. Grout Aggregate: ASTM C404.
   1. Fine Aggregate: Clean, sharp natural sand free from loam, clay lumps, or other deleterious substances.
   2. Coarse Aggregate: Clean, uncoated pea gravel containing no clay mud, loam, or foreign matter. Maximum aggregate size ¾ inch.

D. Water: Clean and potable.

E. Chemical Admixtures: In accordance with Section 03 3000.

2.06 GROUT MIXES:

A. Grout for Masonry Cores: ASTM C476; 3000 psi strength at 28 days.

B. Non-Shrink Grout for Column Base Plates: ASTM C1107, Class B; non-catalyzed, multipurpose construction type containing mineral aggregate; Portland Cement-based; minimum compressive strength 9000 psi at 28 days; flowable, stiff, or plastic consistency.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Euclid Chemical Co.; Hi-Flow Grout.
      b. Laticrete International; Crystex.
      c. Master Builders Solutions; MasterFlow 928.

2.07 GROUT MIXING:

A. Mix transit mixed grout in accordance with ASTM C94.

B. Mix field mixed grout in accordance with ASTM C476.

C. Thoroughly mix grout ingredients in quantities needed for immediate use.

D. Do not use anti-freeze compounds to lower the freezing point of grout.

E. Non-Shrink Grout: Mix in accordance with manufacturer's instructions.

2.08 REINFORCING MATERIALS:

A. Steel Wire: ASTM A82, cold drawn.
   1. Finish: ASTM A153 Class B2, hot dip galvanized after fabrication to 1.50 oz/sq ft.

B. Steel Sheet: ASTM A653; G60 galvanized coating.

C. Steel Bars, Plates and Shapes: ASTM A36.

D. Reinforcing Steel: ASTM A615, 60 ksi yield grade, deformed billet bars, uncoated finish.

2.09 HORIZONTAL JOINT REINFORCING:

A. Manufacturers: In accordance with Section 01 6000.
   1. Heckmann Building Products.

2. Hohmann & Barnard.
3. Masonry Reinforcing Corporation of America; Wire-Bond.

B. General Requirements: ASTM A951; ladder type with cross ties at 16 inches o.c.; width of reinforcing approximately 2 inches less than nominal wall thickness; minimum 10 foot lengths, with prefabricated corners and tees.

C. Single Wythe Walls: Steel wire, minimum 9 gauge deformed side rods and 9 gauge smooth cross rods. (Heckmann 1100 series; H&B 220 Lox All Ladder Mesh; Wire-Bond Series 200)

D. Multiple Wythe Walls: Adjustable type; steel wire, minimum 9 gauge deformed side rods and 9 gauge smooth cross rods, with 3/16 inch eyes and 3/16 inch double legged adjustable pintles. (H&B 270 Lox-All Adjustable Eye-Wire; Wire-Bond Series 800)

2.10 TIES AND ANCHORAGE DEVICES:

A. Manufacturers: In accordance with Section 01 6000.
1. Heckmann Building Products.
2. Hohmann & Barnard.
3. Masonpro, Inc.
4. Masonry Reinforcing Corporation of America; Wire-Bond.
5. Williams Products, Inc.

B. Veneer Anchors for Stud Walls: Self-drilling barrel screw for self-sealing attachment to backup construction; length as required; with adjustable 3/16 inch steel wire triangle ties. (Heckmann Pos-I-Tie; H&B 2-Seal Tie with 2-Seal Byna-Lok Wire Tie; Wire-Bond Sure-Tie)

C. Rebar Positioners: Steel wire, minimum 9 gauge, shaped to hold vertical reinforcing in intended position. (Heckmann 376; H&B RB Rebar Positioners; Wire-Bond 3400 series)

D. Stone Anchors: Steel wire, minimum ¼ inch diameter, with bent ends to engage slot in masonry unit. (Heckmann 162 and 163; H&B 401R and 402R)
1. Fasteners: Stainless steel screws; self-drilling and self-tapping; minimum size No. 12 diameter.

E. Preformed Control Joints for Concrete Masonry Units: ASTM D2287, PVC material; approximately 1 inch less than wall thickness. Provide with corner and tee accessories; cement fused joints. (H&B VS Series; Williams Everlastic 1056; Wire-Bond PVC Control Joint)

2.11 FLASHINGS:

A. Membrane Flashing: Rubberized membrane bonded to cross-laminated polyethylene film; 0.040 inch total thickness; flexible, self-sealing, self-healing, fully adhering.

1. Manufacturers: In accordance with Section 01 6000.
a. GCP Applied Technologies; Perm-A-Barrier Wall Flashing.

b. Hohmann & Barnard; Textroflash.

B. Accessories: Provide surface conditioner, primer, termination bars, and sealant approved by flashing manufacturer.

2.12 ACCESSORIES:

A. Building Paper: ASTM D226, Type I; No. 15 asphalt saturated felt.

B. Bond Break Wrap: Asphalt impregnated cellular paper, ¼ inch minimum thickness.

1. Manufacturers: In accordance with Section 01 6000.
   a. Williams Products, Inc.; Column Boxboard.

C. Weeps and Cavity Protection: High density nonwoven polyethylene mesh.

1. Manufacturers: In accordance with Section 01 6000.
   a. Archovations, Inc.; CavClear.
   b. Hohmann & Barnard; Mortar Trap.
   c. Keene Building Products; Driwall.
   d. Masonpro, Inc.
   e. Mortar Net USA, Ltd.
2. Weeps: 3/8 inch wide, full height of head joint, 1/8 inch less than thickness of outer wythe; color as selected.
3. Cavity Protection Material: Shaped to maintain drainage at weep holes without clogging by mortar droppings; minimum 10 inch height, or full height of cavity at Contractor's option; thickness to match cavity air space.

D. Cleaning Solution: As recommended for application by masonry unit and mortar manufacturers, not harmful to masonry work or adjacent materials; not containing hydrochloric acid or salts that form hydrochloric acid in solution.

1. Manufacturers: In accordance with Section 01 6000.
   a. ProSoCo, Inc.
   b. Diedrich Technologies, Inc.
   c. EaCo Chem.

PART 3 EXECUTION

3.01 PREPARATION:

A. Plug clean-out holes with masonry units. Brace masonry for wet grout pressure.

B. Non-Shrink Grout:
1. Surface Preparation: Clean areas to be grouted and keep free of oil, grease, dirt, and contaminants. Remove loose materials. Metal components in contact with grout shall be de-rusted and free of paint or oils. Concrete in contact with grout shall be thoroughly saturated with water a minimum of 12 hours prior to grout

placement. Remove excess water from holes and voids just prior to grout placement.

2. Forming: Follow forming procedures which allow for complete filling of the space to be grouted and venting to avoid air entrapment. Anchor support elements to prevent movement. Remove support only after grout has hardened sufficiently. Pre-treat wood surfaces with form oil. Cut back edges of concrete which are less than one inch thick to form a uniform unit.

3.02 INSTALLATION:

A. Install mortar, reinforcement and anchorage, flashings and accessories in accordance with the requirements of the unit masonry Sections.

B. Work grout into masonry cores and cavities to eliminate voids.

C. Grout masonry units 6 inches and smaller, and spaces less than 2 inches in width, with fine grout using low lift grouting techniques. Grout masonry units 8 inches and larger, and spaces 2 inches or greater in width, with coarse grout using high or low lift grouting techniques.

D. Low Lift Grouting: Place each grout pour to a height of maximum 48 inches and consolidate with mechanical vibration.

E. High Lift Grouting:
   1. Provide cleanout opening no less than 4 inches high at the bottom of each cell to be grouted by cutting one face shell of masonry unit.
   2. Clean out masonry cells and cavities with compressed air. Remove debris.
   3. After cleaning, seal openings with masonry units.
   4. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
   5. Limit grout lift to 48 inches and consolidate with mechanical vibration prior to placing additional lifts to a maximum pour height of 24 feet.

F. Non-Shrink Grout: Place grout mixture into prepared areas from one side to the other, rapidly and continuously. Trowel grouted surface smooth, splay neatly to 45 degrees.
   1. Curing: Wet cure exposed shoulders for minimum 72 hours.

G. Do not displace reinforcement while placing grout.

H. Remove excess mortar from grout spaces.

I. When grouting is stopped for more than one hour, terminate grout 1½ inch below top of upper masonry unit to form a positive key for subsequent grout placement.

END OF SECTION

SECTION 04 2000 – UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Concrete masonry units.

B. Related Requirements:
   1. Section 04 0500 – Common Work Results for Masonry: Mortar and grout.
   2. Section 04 7200 – Cast Stone Masonry.
   3. Section 07 9200 – Joint Sealants: Backer rod and sealant at control joints.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate reinforcing bar sizes, spacings, locations, quantities, bending and cutting schedules, supporting and spacing devices, and accessories.

1.03 REGULATORY REQUIREMENTS:

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

1.04 QUALIFICATIONS:

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience. All concrete masonry units shall be the products of one manufacturer.

B. Manufacturers of concrete masonry units containing water repellent admixtures shall be certified by the admixture manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Accept units on site. Inspect for damage.

B. Protect masonry units from breakage and from damage to surfaces which will be exposed.

C. Store masonry units on platforms or pallets above grade, protected from soil contact and from water, snow, and ice.

1.06 ENVIRONMENTAL REQUIREMENTS:

A. Cold Weather Construction (below 40 degrees F) and Hot Weather Construction (above 90 degrees F): Follow MIC Hot & Cold Weather Masonry Construction and Section 04 0500.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS:

A. Hollow and Solid Load Bearing Block Units (CMU): ASTM C90, normal weight; natural color.

B. Size and Shape: Nominal modular face size of 8 x 16 inches; thickness as indicated.

C. Compressive Strength: ASTM C140; minimum 1900 psi on net area of unit.

D. Drying Shrinkage: ASTM C426; maximum 0.065 percent.

E. Concrete block shall be free from carbonaceous materials and iron oxides to ensure freedom from staining and popping. Exposed face texture shall be uniform.

F. Water Repellent Admixture: ASTM C1384; integral liquid polymeric admixture mixed with concrete during production of block units to provide resistance to water penetration.

1. Manufacturers: In accordance with Section 01 6000.
   a. Acme-Hardesty Co.; Acme Shield.
   b. Euclid Chemical Co.; Hydrapel.
   c. GCP Applied Technologies, Dry-Block.
   d. Krete Industries, Inc., Krete Dri Gard.
   e. Master Builders Solutions; MasterPel 240.
   f. Sika Corp.; Sikamix W-10.

2. Schedule: All concrete masonry units exposed in exterior walls above grade shall contain water repellent admixture from the same manufacturer as the mortar admixture specified in Section 04 0500.

2.02 ACCESSORIES:

A. Reinforcement and Anchorage: As specified in Section 04 0500.

B. Mortar and Grout: As specified in Section 04 0500.

C. Flashings and Accessories: As specified in Section 04 0500.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify that items provided by other sections of work are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION:

A. Provide temporary shoring and bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING:

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Bond Pattern: Running bond.

D. Mortar Joints:
   1. Exposed Locations Above Grade: Concave.
   2. Below Grade and Concealed Locations: Flush.

E. Typical Coursing: One unit and one mortar joint to equal 8 inches.

3.04 PLACING AND BONDING:

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints. Lay hollow masonry units in full bed of mortar at starting course above footings and foundation walls, and where grouted cores are scheduled.

C. Where concrete masonry units containing water repellent admixture are scheduled, use mortar containing water repellent admixture.

D. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

E. Remove excess mortar as work progresses.

F. Interlock intersections and external corners.

G. At exterior walls, install 4 inch exterior wythe with grouted backup wythe at first course above finish grade to allow for installation of flashing.

H. Install corner units with flush ends at external corners. Install bull nose concrete masonry units at wall ends and where unit ends are fully or partially exposed at jambs. Install jamb units at control joints and bonding angles.

I. Lay masonry units with core cells vertically aligned, clear of mortar and unobstructed.

J. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

K. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

L. Avoid the use of less than half size units at corners, intersections, jambs, and wherever possible at other locations.

3.05 WEEPS:

A. Install weeps in place of mortar in head joints on all exterior walls at minimum 16 inches o.c. and maximum 24 inches o.c. horizontally above wall flashings, at bottom of walls, and elsewhere as indicated.

B. Recess weep material approximately 1/8 inch from face of masonry.

C. Install cavity protection material above weeps to prevent accumulation of mortar and to maintain drainage.

3.06 REINFORCEMENT AND ANCHORAGE:

A. Install horizontal joint reinforcement 16 inches o.c. vertically. Locate longitudinal wires over face shell mortar beds and fully embed in mortar.
   1. Minimum Mortar Cover: 5/8 inch.
   2. Place joint reinforcement continuous in first two joints below top of walls, and in first and second joints above bottom of walls.
   3. Lap joint reinforcement ends minimum 6 inches.

3.07 FLASHINGS:

A. Extend flashings horizontally on all exterior walls at first course above finish grade, and at top of wall.

B. Apply surface conditioner and primer to substrate, and apply termination mastic at top edges, seams, and penetrations, in accordance with flashing manufacturer's recommendations.

C. Turn flashing up minimum 8 inches, and minimum 6 inches above top of cavity protection material; bed into mortar joint of masonry.

D. Lap end joints minimum 6 inches and seal watertight.

E. Turn flashing, fold to form end dam, and seal watertight at corners, bends, penetrations, terminations, and interruptions.

F. Remove and discard release paper from self-adhesive flashings. Position each piece carefully and press firmly into place with hand roller, giving special attention to edges, seams, and penetrations. Fully adhere flashing to substrate to prevent water from migrating under flashing.

3.08 GROUTED COMPONENTS:

A. Grouted Cores:
   1. Reinforce masonry unit cores with reinforcing bars and grout as shown on the Drawings.

2. Retain vertical reinforcing in position at top and bottom of cells and at intervals not exceeding 192 bar diameters. Splice reinforcement in accordance with ACI 318.

B. Splice reinforcing bars minimum 24 bar diameters, or as indicated. Mechanical splice couplers may be used upon submittal of manufacturer's data.

C. Support and secure reinforcing bars from displacement, using rebar positioners. Maintain position within ½ inch of dimensioned position.

D. Place and consolidate grout fill in accordance with Section 04 0500 without displacing reinforcing.

E. Below first floor elevation or grade, grout cores and voids solid.

3.09 CONTROL JOINTS:

A. Provide control joints in all exterior walls above grade, including veneers.

B. Locate control joints as shown on the Drawings, at maximum 25 ft intervals not to exceed 1½ times the wall height, at each corner within a distance of half the wall height, and at changes in wall height, changes in wall thickness, and at construction joints in adjacent work.

C. Extend each control joint through full thickness of masonry without offsets.

D. Do not continue horizontal joint reinforcement through control joints.

E. Install preformed control joint devices and compressible joint filler in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.10 BUILT-IN WORK:

A. As work progresses, install items to be built into the work and furnished under other Sections.

B. Install built-in items plumb and level.

C. Do not build in organic materials subject to deterioration.

3.11 TOLERANCES:

A. Maximum Variation from Unit to Adjacent Unit: 1/32 inch.

B. Maximum Variation from Plane of Wall: ¼ inch in 10 ft and ½ inch in 20 ft or more.

C. Maximum Variation from Plumb: 1/8 inch in 5 ft; ¼ inch in 10 ft; ½ inch in 20 ft or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and ¼ inch in 10 ft; ½ inch in 30 ft or more.

E. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

F. Maximum Variation from Cross Sectional Thickness of Walls: ¼ inch.

3.12 CLEANING:

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces and all exterior masonry with cleaning solution. Rinse thoroughly with water. Do not allow cleaning solution to dry on masonry.

D. Use non-metallic tools in cleaning operations.

3.13 PROTECTION:

A. At the end of each work day, cover top of exposed walls with plastic or canvas secured in place to prevent the entrance of water.

B. Protect finished work from damage by all trades.

C. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

D. Protect glazing assemblies and non-masonry work during masonry cleaning.

END OF SECTION

SECTION 04 7200 – CAST STONE MASONRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Cast stone veneer.
   2. Cast stone sills, bands, and coping caps.

B. Related Requirements:
   1. Section 04 0500 – Common Work Results for Masonry: Mortar and grout; anchors.
   2. Section 04 2000 – Unit Masonry: Masonry wall construction.
   3. Section 07 9200 – Joint Sealants.
   4. Section 09 9623 – Graffiti-Resistant Coatings.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate layout, dimensions, identifying marks and locations, and anchorages; product data, installation instructions, and erection drawings.

B. Samples: Submit two units of each type to illustrate color, texture, and extremes of color range.

1.03 QUALITY ASSURANCE:

A. Provide quality control in accordance with Cast Stone Institute Quality Control Procedures Required for Plant Inspection or equivalent third party plant inspection program.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Accept units on site. Inspect for damage.

B. Protect units from breakage and from staining or other damage to surfaces which will be exposed.

C. Store units on platforms or pallets above grade, protected from soil contact and from water, snow, and ice.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and for 48 hours after completion of work.

B. Protect materials from rain, moisture, and freezing temperatures prior to, during, and for 48 hours after completion of work.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Cement: ASTM C150, Type I or Type III.

B. Aggregate: ASTM C33; gradation may vary to achieve desired finish and texture.

C. Steel Reinforcing: ASTM A615, 60 ksi yield grade; galvanized or epoxy-coated for locations with less than 1½ inch cover.

D. Fiber Reinforcing: Polypropylene fibers; non-fibrillated.

E. Mortar: As specified in Section 04 0500.

F. Pigment: ASTM C979; inorganic synthetic iron oxide.

G. Anchors and Dowels: As specified in Section 04 0500.

2.02 MANUFACTURED UNITS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Reading Rock, Inc.
   2. Baxter Precast, LLC.
   3. Capital Cast Stone.
   4. Continental Cast Stone.
   5. Custom Cast Stone.
   6. Edwards Cast Stone Co.
   7. North American Cast Stone, Inc.
   8. Precast Specialties, Inc.
   9. Royal Stone, LLC.
   10. Stone Products Corporation.
   11. Superior Precast Products, Inc.
   12. York Cast Stone.

B. Performance Requirements: ASTM C1364.
   1. Shipping Weight: 8 to 12 lb/sq ft.
   2. Compressive Strength: ASTM C1194; minimum 6500 psi at 28 days.
   3. Absorption: ASTM C1195; maximum 6 percent.
   4. Freeze/Thaw Resistance: ASTM C666, Procedure A.

C. Veneer Units: As detailed; with corner units.
   1. Nominal Size: As selected.
   2. Color: As selected.
   3. Surface Texture: As selected.

D. Sills and Bands: As detailed.
   1. Color: As selected.
   2. Surface Texture: As selected.

E. Parapet Caps and Copings: As detailed; fabricated to accept anchors, fasteners, supports and lifting devices.
   1. Color: As selected.
   2. Surface Texture: As selected.

2.03 FABRICATION:

A. Fabricate units to required shape and dimensions, for uniform coloration with adjacent units and throughout the installation.

B. Slope exposed top surfaces for natural wash.

C. Cut drip slot in work projecting more than ½ inch over plane of surface below; size slot 3/8 inch wide and ¼ inch deep, full width of projection.

D. Fabrication Tolerances:
   1. Height and Width: Plus 1/16 inch, minus 1/8 inch.
   2. Lengths up to 5 Feet: Plus 1/8 inch, minus 1/8 inch.
   3. Lengths Greater than 5 Feet: Plus 1/8 inch, minus 3/16 inch.

PART 3 EXECUTION

3.01 PREPARATION:

A. Verify that support work and site conditions are ready to receive work.

B. Establish lines, levels and coursing. Protect from disturbance.

3.02 INSTALLATION:

A. Erect units in accordance with supplier's installation instructions and erection drawings.

B. Arrange installation pattern to provide a consistent joint width of ¼ inch.

C. Install units with anchors, supports, fasteners and other attachments indicated or necessary to secure units in place. Shim and adjust as necessary.

D. Obtain approval prior to cutting or fitting items not so indicated. Do not impair appearance or strength of units by cutting.

E. Apply sealant to joints and perimeter in accordance with Section 07 9200.

F. Clean completed work in accordance with Section 04 2000.

G. Apply graffiti-resistant coating in accordance with Section 09 9623.

3.03 ERECTION TOLERANCES:

A. Positioning of Elements: Maximum ¼ inch from true position.

B. Maximum Variation from Plane of Wall: ¼ inch in 10 feet; ½ inch in 50 feet.

C. Maximum Variation Between Face Plane of Adjacent Units: 1/16 inch.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 feet; ¼ inch in 10 feet; ½ inch maximum.

E. Maximum Variation of Joint Thickness: 1/16 inch in 3 feet.

END OF SECTION

SECTION 05 1200 – STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Structural steel framing members.
   2. Base plates.
   3. Anchor bolts, fasteners, and welded connections.

B. Products Furnished But Not Installed Under This Section:
   1. Section 03 3000 – Cast-In-Place Concrete: Anchor rods.

C. Related Requirements:
   1. Section 01 4520 – Testing and Inspecting Services.
   2. Section 04 0500 – Common Work Results for Masonry: Grouting under base plates and bearing plates.
   3. Section 05 2100 – Steel Joist Framing: Joist bearing plates.
   4. Section 05 3113 – Steel Floor Decking: Support framing for small openings.
   5. Section 05 3123 – Steel Roof Decking: Support framing for small openings.
   6. Section 05 5000 – Metal Fabrications: Steel fabrications affecting structural steel work.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Prepare in accordance with AISC Manual of Structural Steel Detailing.

   1. Indicate profiles, sizes, spacing, yield strength of steel, primer, locations of structural members, openings, attachments, and fasteners. Clearly indicate Architect's designation for each member.
      a. Bolted Connections: Indicate bolt sizes and types; spacing and dimensions of bolt holes; edge distances; plate and angle thicknesses and grades. Identify high-strength bolted slip-critical, direct-tensioned shear/bearing connections.
      b. Welded Connections: Indicate shop and field welded connections with AWS A2.0 welding symbols. Indicate weld sizes, net weld lengths, and arc-welding electrode designation.
      c. Indicate cambers and loads.
      d. Indicate factory copes, holes, and cuts.
      e. Where alterations to connections or details are necessary, identify revisions with notes or clouds.

   2. Erection Diagrams: Include elevations and cross sections which will locate all members by piece mark and provide essential dimensions and necessary erection information.

3. Detail Sheets: 11x17 inch sheet size. Indicate dimensions and fabrication information for maximum two members per sheet.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with AISC 303 and AISC 360.

B. Fabricator Qualifications:
   1. Prior to acceptance of the fabricator, the Architect reserves the right to require an inspection by an independent testing agency to verify that the fabricator is capable of performing the desired level of quality in the work to be performed. The fabricator shall cooperate with and make available to the testing agency records and documents which focus on general management, engineering and drafting, procurement, operations, and quality control, and shall allow access to facilities to allow the testing agency to examine actual fabrication work in the shop and drafting room at the time of the inspection.
   2. Companies participating in the AISC Quality Certification Program and designated as an AISC Certified Plant, Category STD, will not be subject to a testing agency inspection.

C. Installer Qualifications: Company participating in the AISC Quality Certification Program and designated as an AISC Certified Erector, Category CSE.

D. Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

E. Design connections not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located. Submit calculations when requested.
   1. Unless specific end moments and reactions are indicated on Drawings, design connections to resist shear based on the maximum uniform load capacity of the member for the span, plus 15 percent, but not more than the shear capacity of the member.
   2. Design fillet welds for the thickness of the material joined. Complete joint and partial joint penetration welds shall develop the full strength of the thinner material.
   3. Account for eccentricity in all connection designs.

1.04 REGULATORY REQUIREMENTS:

A. Conform to UL Fire Resistance Directory for fire rated construction where indicated on the Drawings.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Coordinate delivery schedule of built-in items, such as anchors and lintels, with installer.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Structural Steel Members:
   1. W Shapes: ASTM A992.
   2. Structural Tubing: ASTM A500, Grade B.
   3. Pipe: ASTM A53, Grade B.
   4. Other Shapes, Channels, Angles, Bars and Plates: ASTM A36 or ASTM A572, Grade 50.
   5. Include beam bearing plates, column base and top plates, lintel plates, and other components indicated.

B. Bolts, Nuts, and Washers: High strength, ASTM F3125 Grade A325 or Grade A490, marked with radial lines to indicate strength.
   1. Bolts shall be ¾ inch minimum size, N bearing condition, unless noted.
   2. ASTM A307 bolts may be used only for temporary field connections or bracing.

C. Anchor Rods: ASTM F1554, Grade 36, with ASTM A563 Grade A heavy hex nuts.

D. Threaded Rods: ASTM A449.

E. Welding Materials: AWS D1.1; type required for materials being welded.
   1. Welding Electrodes: E70XX.

F. Shop and Touch-Up Primer: SSPC 25, Type I.

G. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

H. Bituminous Coating: Cold applied asphalt mastic.

I. All materials shall be new and free from rust.

2.02 FABRICATION:

A. Shop fabricate all items to maximum practical extent, complete and ready for installation.

B. Where shop welding is indicated, continuously seal joined members by continuous welds or by intermittent welds and plastic filler. Grind exposed welds smooth.

C. Fabricate connections for bolt, nut, and washer connectors.

D. Develop required camber for members.

E. Drill or punch all holes required for the attachment of work of other trades.

F. Provide a vertical stabilizer plate, minimum 6 x 6 inch, on each column where a steel joist is located on the column line. Extend plate minimum 3 inches below bottom of bottom chord, with a 13/16 inch diameter hole for guying cable attachment.

G. Where beams frame into opposite sides of the same column web, provide erection seat angles or shear connections to allow erection of each beam independently with at least one non-common bolt.

H. Where joists do not connect to column cap plates, provide diagonal L2x2x3/16" at joist closest to each column. Weld angle to top of column or to bottom flange of beam, and to the first top chord panel point of joist, with 2 inches of 1/8 inch fillet weld each end.

2.03 FINISH:

A. Prepare structural component surfaces in accordance with SSPC procedures.

B. Shop prime structural steel members.
   1. Do not prime surfaces that will be galvanized or embedded in concrete or grout, or connections that will be field welded or high strength bolted.

C. Where indicated, galvanize structural steel members to ASTM A123, Grade 65, 1.50 oz/sq ft.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions prior to beginning fabrication or erection.

3.02 ERECTION:

A. Allow for all loading conditions during erection, including dead, live, wind, and snow loads and temporary construction loads. Provide sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

B. Align structure within allowable erection tolerances prior to making final connections.

C. Field weld components indicated on shop drawings.

D. Field connect members with threaded fasteners; tighten to required resistance using the Research Council on Structural Connections (RCSC) turn-of-nut tightening method except where otherwise indicated or approved. Verify that contact surfaces are free of oil, grease, rust, mill scale, and other harmful substances.

E. Do not field cut, splice, cope, or alter structural members without approval of Architect. Do not repair, replace, or field modify anchor rods without written approval of Architect.

F. Connect structural members to concrete using embedded anchors.

G. Where members scheduled to be painted will be inaccessible after erection, field paint in accordance with Section 09 9000 prior to erection.

H. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete or grout. Touch up galvanized surfaces in accordance with ASTM A780.

I. Apply bituminous coating to unprimed surfaces embedded in concrete or grout or exposed to soil, minimum 15 mil dry film thickness.

J. Grout under base plates and bearing plates in accordance with Section 04 0500. Trowel grouted surfaces smooth, splay neatly to 45 degrees.

3.03 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: ¼ inch per story, non-cumulative.

B. Maximum Offset from True Alignment: ¼ inch.

3.04 FIELD QUALITY CONTROL:

A. Testing firm will perform high strength bolt inspection in accordance with Section 01 4520.

END OF SECTION

SECTION 05 2100 – STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Open web steel joists, with bridging, attached seats and anchors.

B. Related Requirements:
   1. Section 05 3113 – Steel Floor Decking: Support framing for small openings.
   2. Section 05 3123 – Steel Roof Decking: Support framing for small openings.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Submit the number of sets required for plan approval, with original design professional signature and embossed seal.
   1. Indicate joist manufacturer, grades of steel, standard designations, configuration, sizes, length of each joist, spacing, locations of joists, joist leg extensions.
   2. Indicate panel point spacing, size of all members, primer, and shop welding details.
   3. Indicate joist erection coding, bridging, connections, and attachments.
   4. Indicate cambers.
   5. Shop drawings for "Special" joists shall include loading conditions, stress diagrams, calculations, member sizes, types and sizes of gussets (if any), connectors, and an analysis of all combined compressive and tensile forces.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with SJI Specifications and tables, including headers and other supplementary framing.

B. Erector Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

C. Design drift loads, concentrated loading conditions, openings, headers, bridging, metal roof bridging, stabilizer plates, chord bracing, "Special" joists, and special conditions indicated on the Drawings, under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

   1. Coordinate bearing dimensions for bearing plates and column cap plates with structural steel supplier to verify sufficient width for fillet weld attachment.

   2. Design roof joists for net wind uplift of 9 psf.

   3. "Special" joists are indicated on Drawings with diagrams of load magnitudes, configurations, and other requirements that differ from usual conditions.

4. Live load deflection for "Special" joists shall not exceed SJI Specifications. Maximum allowable total load deflection shall be as follows:
   a. Floor Joists: 1/480 of span or 5/8 inch, whichever is smaller.
   b. Roof Joists with Gypsum Board: 1/360 of span.
   c. Other Conditions: 1/240 of span.

1.04 DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, protect, and handle products to site under provisions of Section 01 6000 and in accordance with SJI requirements.

B. Coordinate delivery schedule of built-in items, such as bearing plates and anchors, with installer.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel: In accordance with SJI Specifications.

B. Structural Steel for Bridging, Supplementary Framing, and Joist Leg Extensions: ASTM A36.

C. Bearing Plates: ASTM A36.

D. Bolts, Nuts and Washers: ASTM F3125 Grade A325; plain, uncoated finish.

E. Anchor Bolts, Nuts and Washers: ASTM F1554, Grade 36.

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

G. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide; or manufacturer's standard shop primer with equivalent performance characteristics.

2.02 FABRICATION:

A. Open Web Joist Members: SJI Type K and KCS; parallel chord; underslung ends with top chord bearing.

B. Provide bottom and top chord extensions as indicated. Provide bottom chord extensions on column lines.

C. Fabricate to achieve end bearing of 2½ inches on steel, or as indicated on Drawings.

D. Provide joist seats to suit project conditions, and to resist lateral rollover force of minimum 1750 lbs due to wind or seismic loads.

E. Develop camber in accordance with SJI Specifications for all joists. Camber is not optional.

F. Provide bridging for all joists in accordance with SJI Specifications for size, type, and spacing. Provide bridging anchors at ends of bridging lines.

G. Factory install additional web members required for concentrated loads not located at panel points, and other special loading conditions indicated on the Drawings.

2.03 FINISH:

A. Prepare joist component surfaces in accordance with SSPC procedures.

B. Shop prime joists.
   1. Do not prime connections that will be field welded.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions prior to beginning fabrication or erection.

B. Verify that supports are properly installed and braced prior to beginning erection.

3.02 ERECTION:

A. Erect and bear joists on supports.

B. Erect joists and bridging in accordance with SJI Specifications.
   1. Install bolted diagonal bridging before slackening hoisting lines; location and number of rows in accordance with OSHA requirements.
   2. Field bolt top chords to steel columns. Field bolt bottom chord extensions to steel columns after dead loads are in place.

C. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.

D. Do not apply construction or erection loads until completion of bridging installation and anchorage.

E. After joist alignment and installation of framing, field weld joist seat to structural framing.

F. Position and field weld joist chord extensions and wall attachments.

G. Do not permit erection of decking until completion of erection and installation of permanent bridging and bracing.

H. Do not field cut or alter structural members without approval of joist manufacturer.

I. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: ¼ inch.

B. Maximum Offset from True Alignment: ¼ inch.

END OF SECTION

SECTION 05 3113 – STEEL FLOOR DECKING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Steel floor deck and accessories.
   2. Steel deck end forms to contain wet concrete.
   3. Framing for openings up to and including 18 inches.

B. Related Requirements:
   1. Section 03 3000 – Cast-In-Place Concrete: Concrete topping over metal floor deck.
   2. Section 05 1200 – Structural Steel Framing: Support framing for openings larger than 18 inches.
   3. Section 05 3123 – Steel Roof Decking.
   4. Division 22 – Plumbing: Reinforcement pans with floor drain hub assemblies.
   5. Division 26 – Electrical: Electrical floor boxes and covers.

1.02 PERFORMANCE REQUIREMENTS:

A. Design metal deck in accordance with SDI Design Manual.

B. Calculate to structural working stress design and maximum vertical deck deflection of 1/240.

C. Lateral deflection of diaphragm shall not exceed 1/500 of the story height.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate manufacturer, deck plan, lap dimensions and connections, support locations, projections, openings and reinforcement, raceways and outlet box locations, pertinent details, and accessories.

B. Product Data: Provide deck profile characteristics and dimensions, structural properties, and finishes.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

B. Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

C. Design special conditions not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Cut plastic wrap to encourage ventilation and avoid condensation.

B. Store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. New Millennium Building Systems, LLC.

B. United Steel Deck, Inc.

C. Vulcraft Division, Nucor Corp.

2.02 MATERIALS:

A. Galvanized Sheet Steel: ASTM A653, Structural Quality, minimum 33 ksi yield strength; with G60 galvanized coating.

B. Framing Angles: ASTM A36.

C. Welding Materials: AWS D1.1; type required for materials being welded.
   1. Welding Electrodes: E70XX.

D. Shop and Touch-Up Primer:
   1. Galvanized Deck: SSPC 20.
   2. Framing Angles: SSPC 15, Type 1, red oxide.

2.03 FABRICATION:

A. Metal Floor Deck: Galvanized sheet steel, configured as follows:
   1. Span Design: Multiple; minimum three spans per sheet. Increase thickness as required to provide equivalent strength for single span and two span conditions.
   2. Minimum Metal Thickness Excluding Finish: 26 gauge.
   3. Nominal Height: 9/16 inch, fluted profile.
   4. Formed Sheet Width: 30 inch or 36 inch.
   5. Side Joints: Lapped.
   6. Flute Sides: Plain vertical face.
   7. Shop cut openings 16 square feet in area or larger.

2.04 ACCESSORIES:

A. Flute Closures: Closed cell foam rubber; profiled to fit tight to deck.

B. Floor Drain Pans, Metal Closures, Wet Concrete Stops: Fabricated of metal of same type and finish as deck; minimum 14 gauge thickness.

C. Fasteners: Stainless steel, self tapping.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Examine support framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of this work.

3.02 ERECTION:

A. Erect metal deck in accordance with SDI 30 and manufacturer's instructions. Allow for temporary construction loadings including wet concrete.
   1. Verify orientation, rib inversion, and installation direction prior to beginning installation.

B. Deliver deck to construction area in quantities required for immediate installation. Do not store deck on floor structure. Do not use deck units as a working platform or storage area until units are permanently attached in position.

C. Field cut for openings less than 16 square feet in area, and all skew cuts. Provide openings for deck penetrations shown on the Drawings.

D. Bear deck on steel supports with 1½ inch minimum bearing at end supports and 3 inches at interior bearing. Align and level. Position end laps over supports; lap sheets 4 inches minimum.

E. Attach deck to steel support members at ends and intermediate supports as scheduled and in accordance with SDI Diaphragm Design Manual.

F. Fasten side laps at 24 inches oc maximum, using welds, screws, or mechanically crimped connections.

G. Reinforce deck openings larger than 6 inches in size, as detailed.

H. Install wet concrete stops at floor edge upturned to top edge of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.

I. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.

J. Install single row of flute closures above walls and partitions extending to underside of deck.

K. Position floor drain pans with flange bearing on top surface of deck. Weld at each deck flute.

L. Where deck is scheduled to be exposed from occupiable space below, repair ragged cuts, bent deck, and visible damage.

M. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, on both top and underside of deck. Touch up galvanized surfaces in accordance with ASTM A780.

N. Do not permit the hanging or supporting of any items from the deck, including suspended ceilings, unless specifically approved by the Architect.

O. Provide notice and access to other trades to facilitate installation of embedded items including sleeves, fittings, and conduit prior to pouring floor slab.

END OF SECTION

SECTION 05 3123 – STEEL ROOF DECKING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Steel roof deck and accessories.
   2. Framing for openings up to and including 36 inches.

B. Related Requirements:
   1. Section 05 1200 – Structural Steel Framing: Support framing for openings larger than 36 inches.
   2. Section 05 3113 – Steel Floor Decking.
   3. Section 07 5000 – Membrane Roofing.
   4. Section 07 6100 – Sheet Metal Roofing.
   5. Division 22 – Plumbing: Roof drain assemblies.

1.02 PERFORMANCE REQUIREMENTS:

A. Design metal deck in accordance with SDI Design Manual.

B. Calculate to structural working stress design and maximum vertical deck deflection of 1/240.

C. Lateral deflection of diaphragm shall not exceed 1/500 of the story height.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate manufacturer, deck plan, lap dimensions and connections, support locations, projections, openings and reinforcement, pertinent details, and accessories. Where mechanical fasteners are proposed, include manufacturer's test data and design charts with proposed fastener spacing.

B. Product Data: Provide deck profile characteristics and dimensions, structural properties, and finishes.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

B. Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

C. Design special conditions not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Cut plastic wrap to encourage ventilation and avoid condensation.

B. Store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. New Millennium Building Systems, LLC.

B. United Steel Deck, Inc.

C. Vulcraft Division, Nucor Corp.

2.02 MATERIALS:

A. Galvanized Sheet Steel: ASTM A653, Structural Quality, minimum 33 ksi yield strength; with G60 galvanized coating.

B. Framing Angles: ASTM A36.

C. Welding Materials: AWS D1.1; type required for materials being welded.
   1. Welding Electrodes: E70XX.

D. Shop and Touch-Up Primer:
   1. Galvanized Deck: SSPC 20.
   2. Framing Angles: SSPC 15, Type 1, red oxide.

2.03 ACCESSORIES:

A. Flute Closures: Closed cell foam rubber; profiled to fit tight to deck.

B. Sump Pans, Sump Plates, Metal Closures: Fabricated of metal of same type and finish as deck; minimum 14 gauge thickness.
   1. Sump Pans: Minimum 29 x 33 inch with 1½ inch recess; with minimum 3 inch bearing flanges; with sump surface level in relationship to roof slope.

C. Screws: Stainless steel, self tapping.

D. Mechanical Fasteners: Powder-actuated or pneumatically-driven.

2.04 FABRICATION:

A. Metal Deck: Galvanized sheet steel, configured as follows:
   1. Span Design: Multiple; minimum three spans per sheet. Increase thickness as required to provide equivalent strength for single span and two span conditions.
   2. Minimum Metal Thickness Excluding Finish: 22 gauge.
   3. Nominal Height: 1½ inch, fluted profile, SDI Type WR.
   4. Formed Sheet Width: 30 inch or 36 inch.
   5. Side Joints: Lapped.
   6. Flute Sides: Plain vertical face.

7. Shop cut openings 16 square feet in area or larger.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Examine support framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of this work.

3.02 ERECTION:

A. Erect metal deck in accordance with SDI 30 and manufacturer's instructions.

B. Deliver deck to roof in quantities required for immediate installation. Do not store deck on roof. Do not use deck units as a working platform or storage area until units are permanently attached in position.

C. Field cut for openings less than 16 square feet in area, and all skew cuts. Provide openings for roof deck penetrations shown on the Drawings.

D. Bear deck on steel supports with 1½ inch minimum bearing at end supports and 3 inches at interior bearing. Align and level. Position end laps over supports; lap sheets 4 inches minimum.

E. Attach deck to steel support members at ends and intermediate supports as indicated on Drawings, and in accordance with SDI Diaphragm Design Manual.

F. Fasten side laps at 24 inches oc maximum.

G. Reinforce deck openings larger than 6 inches in size, as detailed.
   1. Where roof openings are provided for HVAC or other equipment, verify opening size and location with equipment supplier.

H. Install minimum 6 inch wide sheet steel cover plates, of same thickness as deck, where deck changes direction. Mechanically attach at 12 inches oc maximum.

I. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.

J. Install single row of flute closures above walls and partitions extending to underside of deck.

K. Roof Sump Pans: Position with flange bearing on top surface of deck. Weld at each deck flute.

L. Where deck is scheduled to be exposed from occupiable space below, repair ragged cuts, bent deck, and visible damage.

M. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, on both top and underside of deck. Touch up galvanized surfaces in accordance with ASTM A780.

N. Do not permit the hanging or supporting of any items from the deck, including suspended ceilings, unless specifically approved by the Architect.

O. Provide notice to roofing installer at least 48 hours prior to completion of roof deck installation.

END OF SECTION

SECTION 05 4000 – COLD FORMED METAL FRAMING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Load bearing formed steel framing.
   2. Formed steel roof trusses.

B. Related Requirements:
   1. Section 04 7200 – Cast Stone Masonry: Stone veneer supported by wall stud metal framing.
   2. Section 05 1200 – Structural Steel Framing: Structural building framing.
   3. Section 05 3123 – Steel Roof Decking.
   4. Section 07 2100 – Thermal Insulation.
   5. Section 07 2216 – Roof Insulation.
   6. Section 09 2210 – Metal Support Systems: Non load bearing metal stud framing.
   7. Section 09 2900 – Gypsum Board.
   8. Section 09 8100 – Acoustic Insulation.

1.02 SYSTEM DESCRIPTION:

A. Size components to withstand design loads shown on the Drawings and in accordance with applicable building codes.

B. Maximum Allowable Deflection:
   1. Wall Stud Backup for Masonry Veneer: 1/720 of span, based on stud properties only without considering sheathing.
   2. Framing with Gypsum Board: 1/360 of span.
   3. Other Conditions: 1/240 of span.

C. Design systems 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 cyclical day/night temperature ranges.

D. Design systems to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings:
   1. Indicate component details, framed openings, headers, bearing, bracing, bridging, splicing, loading, welds, type and location of fasteners, and accessories or items required of related work.
   2. Indicate stud, joist, rafter, and roof truss layout.

3. Provide fastening and anchoring details, including mechanical fasteners, method of securing studs to tracks, and bolted and welded framing connections.
4. Provide design calculations for roof trusses and specially fabricated framing.
5. Submit the number of sets required for plan approval, with original design professional signature and embossed seal.

B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, and limitations.

1.04 QUALITY ASSURANCE:

A. Calculate structural properties of framing members in accordance with AISI D100 and AISI S100, Association of Wall and Ceiling Industries (AWCI), Metal Framing Manufacturers Association (MFMA), and AWS requirements.

B. Qualifications:
1. Manufacturer: Company specializing in performing the work of this section with minimum three years documented experience.
2. Installer: Company specializing in performing the work of this section with minimum three years documented experience.

C. Design conditions not detailed on the Drawings and all truss components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

D. Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. ClarkDietrich Building Systems**.**

B. J. N. Linrose Manufacturing.

C. MiTek, Inc.; UltraSpan.

D. MRI Steel Framing, LLC.

E. State Building Products.

F. Steel Structural Products LLC.

G. Ware Industries, Inc.; Marino Ware.

2.02 MATERIALS:

A. Sheet Steel: ASTM A1003, Structural Grade as required for project conditions, Type H; galvanized to G90 coating class.

2.03 COMPONENTS:

A. Studs: ASTM C955; formed steel, minimum 18 gauge, 0.043 inch minimum base metal thickness, unless otherwise indicated or required by loading conditions and deflection criteria; channel shape, punched web; sizes as shown on the Drawings.

B. Track: ASTM C955; formed steel, C-shape; same material, width, and thickness as primary members; solid web.

C. Headers and Jambs: Factory fabricated from unpunched components, with stiffened flanges.

D. Truss Components: Formed steel, hat or open box shape, solid web; sizes and gauges as required by design conditions and loadings.

2.04 ACCESSORIES:

A. Bracing and Furring: Formed sheet steel, thickness determined for conditions encountered.

B. Stud Bridging: Formed sheet steel, V-bar shape, minimum 18 gauge, 0.043 inch minimum base metal thickness.

C. Plates, Gussets, Clips: Sheet steel, thickness determined for conditions encountered.

D. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

2.05 FASTENERS:

A. Self-drilling, Self-tapping Screws, Bolts, Nuts, and Washers: ASTM A123, hot dip galvanized to 1.25 oz/sq ft; drill points hardened with lower hardness for load-bearing section.

B. Anchorage Devices: Drilled expansion bolts, Tapcon type.

C. Welding: In conformance with AWS D1.1 and AWS D1.3. Limit field welding to locations that cannot be adequately secured with other fastening methods.

2.06 FABRICATION:

A. Fabricate assemblies of framed sections and trusses of sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.

B. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify site conditions prior to beginning fabrication or erection.

B. Verify that building framing components are ready to receive work.

3.02 ERECTION:

A. Install components in accordance with ASTM C1007 and manufacturer's instructions.

B. Make provision for erection stresses. Provide temporary alignment and bracing.

C. Stud Framing:
   1. Place lower track on uniform, level bearing surface. Align lower and upper tracks; locate to wall layout. Secure in place at maximum 24 inches oc. Splice lengths of track; secure adjacent ends to common structural element.
   2. Place studs at spacings indicated on the Drawings; not more than 2 inches from abutting walls and at each side of openings. Plumb and align studs; connect studs to tracks.
   3. Construct corners using minimum three studs. Frame wall openings with headers and supporting studs; provide double studs at opening jambs. Frame each side of wall expansion joints with a separate stud.
   4. Erect load bearing studs one piece full length. Do not permit splicing of studs.
   5. Erect load bearing studs, brace, and reinforce to develop full strength, to achieve design requirements.
   6. Install bridging at maximum 48 inches oc vertically; weld bridging to both stud flanges.
   7. Install intermediate studs above and below openings to align with wall stud spacing.
   8. Where non-load bearing framing extends to underside of structure above, accommodate structural deflection by one of the following methods as approved by framing manufacturer:
      a. Double deep leg head runner with studs secured to lower runner only.
      b. Single deep leg head runner with studs secured to horizontal bridging within 12 inches of track.
      c. Head runner with pre-attached UL classified galvanized steel clips and slotted holes for stud attachment with mechanical fasteners.
   9. Install blocking between studs for attachment of fixtures and mechanical and electrical items anchored to walls.
   10. Install diagonal bracing at shear wall locations.

D. Truss Framing:
   1. Place framing components at spacings indicated on the Drawings; not more than 2 inches from abutting walls. Connect members to supports.
   2. Set members parallel and level, with lateral bracing and bridging.
   3. Install bridging in accordance with manufacturer's design.
   4. Where members bear on wall stud framing, locate bearing points directly over studs or provide load distributing member to top of stud track.
   5. Provide additional framing around openings.
   6. Provide web stiffeners at reaction points and at points of concentrated loading, where required by loading conditions.
   7. Provide end blocking where ends are not otherwise restrained from rotation.

E. Coordinate placement of insulation in spaces made inaccessible after erection.

F. Touch up field welds and damaged galvanized surfaces with primer in accordance with ASTM A780.

3.03 ERECTION TOLERANCES:

A. Vertical Alignment of Studs: 1/960 of span.

B. Horizontal Alignment of Walls: 1/960 of span.

C. Framing Member Spacing: Within 1/8 inch of designated spacing; cumulative error not exceeding requirements of finishing materials.

D. Prefabricated Panels: Maximum 1/8 inch out of square.

E. Exterior Edge of Framing Member: 1/8 inch from true position.

F. Differential Movement Capacity Between Top Track and Studs: ½ inch.

END OF SECTION

SECTION 05 5000 – METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Shop fabricated steel items.

B. Related Requirements:
   1. Section 03 3000 – Cast-In-Place Concrete: Placement of metal fabrications in concrete.
   2. Section 04 2000 – Unit Masonry: Attachment of metal fabrications to masonry.
   3. Section 05 1200 – Structural Steel Framing: Beam bearing plates and column base plates; anchor rods for structural steel columns.
   4. Section 05 3113 – Steel Floor Decking: Support framing for small openings in floor deck.
   5. Section 05 3123 – Steel Roof Decking: Support framing for small openings in roof deck.
   6. Section 05 5100 – Metal Stairs.
   7. Section 05 5133 – Metal Ladders.
   8. Section 05 5200 – Metal Railings.
   9. Section 06 2000 – Finish Carpentry.
   10. Section 09 9000 – Painting and Coating.
   11. Section 10 1453 – Traffic Signage: Sign posts.

1.02 PERFORMANCE REQUIREMENTS:

A. Conform to applicable building code for applicable loads.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate materials, finishes, profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel Sections and Plates: ASTM A36.

B. Pipe: ASTM A53, Grade B, Schedule 40.

C. Steel Sheet: ASTM A653, galvanized to G90 designation.

D. Bolts, Nuts, and Washers: ASTM A307, galvanized to ASTM A153 for galvanized components.

E. Welding Materials: AWS D1.1; type required for materials being welded.
   1. Welding Electrodes: E70XX.

F. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

G. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

H. All materials shall be new and free from rust.

2.02 FABRICATION:

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured. Miter members at changes of direction, except where specifically noted otherwise.

C. Continuously seal joined members by continuous welds or by intermittent welds and plastic filler.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersink 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. Drill or punch all holes required for the attachment of work of other trades.

2.03 FABRICATION TOLERANCES:

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

2.04 FINISHES:

A. Surfaces to be Primed: Prepare in accordance with SSPC procedures.
   1. Do not prime surfaces that will be embedded in concrete or grout, or connections that will be field welded.
   2. Prime paint items with one coat.

B. Surfaces to be Galvanized: Apply galvanized coating after fabrication to ASTM A123, minimum 1.25 oz/sq ft.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION:

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates. Coordinate work with installer.

3.03 INSTALLATION:

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on shop drawings. Perform field welding in accordance with AWS D1.1.

D. Obtain approval prior to site cutting or making adjustments not scheduled.

E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 SCHEDULE:

A. The following Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

B. Supplemental Support Framing: Light gauge galvanized steel channel framing systems.

1. Manufacturers: In accordance with Section 01 6000.
   a. Tyco Electrical & Metal Products; Unistrut.
   b. Eaton; B-Line 4Dimension.
   c. Thomas & Betts; Superstrut.

C. Steel Guard Posts, Exterior: As detailed; steel pipe, 8 foot minimum length; concrete filled, crowned cap; prime paint finish.

D. Roof Opening Frames: As detailed; steel angles; prime paint finish.

E. Frames for Overhead Door Openings: Steel bent plates; galvanized finish.

F. Frames for Exterior Gates: As detailed; galvanized steel pipe posts and hinges; steel angle frame. Prep for attachment of lumber in accordance with Section 06 2000.

1. Latches: Slide bolt; mounting plate for carriage bolt attachment to gate frame; provisions for padlock attachment; stainless steel. (National Hardware N342-659)

2. Drop Pins: ½ inch diameter L-shaped cane bolt, 12 inch length, with attachment hardware; stainless steel. (National Hardware N348-516)

END OF SECTION

SECTION 05 5100 – METAL STAIRS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Steel stair frame of structural sections, with closed risers.
   2. Pan stair treads and landings to receive concrete fill.

B. Related Requirements:
   1. Section 03 3000 – Cast-In-Place Concrete: Concrete fill in stair pans and landings; reinforcement for concrete; placement of metal anchors in concrete.
   2. Section 05 5200 – Metal Railings.
   3. Section 09 9000 – Painting and Coating.

1.02 DESIGN REQUIREMENTS:

A. Fabricate stair assembly to support a uniform live load of 100 lb/sq ft and a concentrated load of 300 lbs with deflection of stringer or landing framing not to exceed 1/240 of span.

B. Fabricate stair assembly to NAAMM AMP 510, Architectural Class.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Indicate erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

1.04 QUALITY ASSURANCE:

A. Prepare shop drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel Sections and Plates: ASTM A36.

B. Steel Tubing: ASTM A500, Grade B.

C. Sheet Steel: ASTM A1011 Structural Quality, Grade 30.

D. Bolts, Nuts, and Washers: ASTM F3125 Grade A325, galvanized to ASTM A153 for galvanized components.

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

F. Welding Electrodes: E70XX.

G. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

H. Concrete: Type specified in Section 03 3000.

I. All materials shall be new and free from rust. Materials exposed to view shall be smooth and free from pitting, seam marks, roller marks, roller trade names, roughness and other surface blemishes.

2.02 FABRICATION – GENERAL:

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured. Provide hardware and reinforcement to accommodate site assembly and installation.
   1. Continuously seal joined members by continuous welds or by intermittent welds and plastic filler.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Exposed Mechanical Fastenings: Flush countersink screws or bolts, unobtrusively located, consistent with design of component, except where specifically noted otherwise.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

F. Accurately form components required for anchorage of stairs and landings to each other and to building structure.

G. Accommodate expansion and contraction of members and building movement without damage to connections or members.

H. Drill or punch all holes required for the attachment of work of other trades.

2.03 FABRICATION – STAIRS AND LANDINGS:

A. Fabricate stairs and landings with closed risers and treads of metal pan construction, ready to receive concrete.

B. Form treads and risers with minimum 14 gauge sheet steel stock. Secure tread pans to stringers with clip angles; welded in place.

C. Form stringers with rectangular hollow sections, minimum 12 inches deep.

D. Form landings with minimum 12 gauge sheet stock. Reinforce underside with angles to attain design load requirements.

E. Prime paint components.

2.04 FINISHES:

A. Surfaces to be Primed: Prepare in accordance with SSPC procedures.
   1. Do not prime surfaces that will be embedded in concrete or grout, or connections that will be field welded.
   2. Prime paint items with one coat.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION:

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply steel items required to be cast into concrete with setting templates. Coordinate work with installer.

3.03 INSTALLATION:

A. Install components plumb and level, accurately fitted, free from distortion or defects.

B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.

C. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

D. Field weld components indicated on shop drawings. Perform field welding in accordance with AWS D1.1.

E. Field bolt and weld to match shop bolting and welding. Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

F. Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.

G. Obtain approval prior to site cutting or making adjustments not scheduled.

H. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: ¼ inch per story, non-cumulative.

B. Maximum Offset from True Alignment: ¼ inch.

END OF SECTION

SECTION 05 5133 – METAL LADDERS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Access ladders.

B. Related Requirements:
   1. Section 07 7233 – Roof Hatches.
   2. Section 09 9000 – Painting and Coating.
   3. Section 14 2023 – Passenger Elevators.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate materials, finishes, profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel Sections and Plates: ASTM A36.

B. Steel Sheet: ASTM A653, galvanized to G90 designation.

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

D. Welding Electrodes: E70XX.

E. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

2.02 STEEL ACCESS LADDERS:

A. Access Ladders: As detailed; steel bar side rails; solid steel rod rungs with nonslip coating; with steel mounting brackets and attachments; prime paint finish.

2.03 FABRICATION:

A. Fabricate ladders in accordance with ANSI A14.3.

B. Fit and shop assemble items in largest practical sections, for delivery to site.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Exposed Mechanical Fastenings: Flush countersink screws or bolts, unobtrusively located, consistent with design of component, except where specifically noted otherwise.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FINISHES:

A. Surfaces to be Primed: Prepare in accordance with SSPC Painting Manual.
   1. Do not prime surfaces that will be embedded in concrete or grout, or connections that will be field welded.
   2. Prime paint items with one coat.

PART 3 EXECUTION

3.01 PREPARATION:

A. Supply items to be cast into concrete with setting templates. Coordinate work with installer.

3.02 INSTALLATION:

A. Install units plumb and level, accurately fitted, free from distortion or defects.

B. Obtain approval prior to site cutting or making adjustments not scheduled.

END OF SECTION

SECTION 05 5200 – METAL RAILINGS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Steel and stainless steel railings and fittings.

B. Related Requirements:
   1. Section 08 8000 – Glazing: Glass baluster infill.
   2. Section 09 9000 – Painting and Coating.

1.02 DESIGN REQUIREMENTS:

A. Fabricate railing assembly, wall rails, and attachments to resist a concentrated load of 200 lbs applied in any direction at any point, and a uniform load of 50 lb/ft applied in any direction, without damage or permanent set.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

B. Samples: Submit two 24 inch long samples of stainless steel railing systems, including each type of fitting to be used.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel Pipe: ASTM A53, Grade B, Schedule 40.

B. Steel Tubing: ASTM A513; minimum 1/8 inch wall thickness, or as required for application.

C. Steel Bars: ASTM A36.

D. Stainless Steel: ASTM A167, Type 304 or 316.

E. Stainless Steel Tubing: ASTM A269, Type 304.

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

G. Welding Electrodes: E70XX.

H. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

I. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

J. All materials shall be new and free from rust.

2.02 STEEL RAILING SYSTEMS:

A. Rails and Posts: 1¼ inch nominal diameter steel pipe or 1½ inch outside diameter steel tubing; welded joints.

B. Bars: ¾ inch diameter steel, spaced as indicated.

C. Fittings: Elbows, T-shapes, wall brackets, end caps, escutcheons; cast steel.

D. Mounting: Adjustable brackets and flanges, with backing plate for mounting in stud wall construction.

E. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing; ASTM B633, Class Fe/Zn 25 zinc plated.

F. Splice Connectors: Steel welding collars.

G. Finish: Galvanized to ASTM A123, minimum 1.25 oz/sq ft galvanized coating.

2.03 STAINLESS STEEL RAILING SYSTEMS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Julius Blum & Co., Inc., Connectorail system.
   2. Hollaender Manufacturing Co.; Interna-Rail.

B. Rails: Cold-rolled stainless steel pipe, Ornamental Grade, Schedule 5; 1¼ inch nominal diameter.
   1. Wall Mounting Brackets: Self-aligning adjustable type.

C. Fittings: Radius elbows, T-shapes, wall returns, brackets, end caps, escutcheons; manufacturer's standard aluminum fabrications.

D. Mounting: Adjustable brackets and flanges, with backing plate for mounting in stud wall construction.

E. Splice Connectors: Extruded aluminum; serrated exterior; sized for drive fit to rails and fittings.

F. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.

G. Finish: No. 4 Satin.

2.04 FABRICATION:

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured. Provide hardware and reinforcement to accommodate site assembly and installation.

C. Provide anchors and other components required for connecting railings to structure, with minimum 1½ inch clearance between wall and railing.

D. Continuously seal joined members by continuous welds or by intermittent welds and plastic filler.

E. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

F. Exposed Mechanical Fastenings: Flush countersink screws or bolts, unobtrusively located, consistent with design of component, except where specifically noted otherwise.

G. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

H. Accurately form components to suit stairs and landings, to each other and to building structure.

I. Accommodate expansion and contraction of members and building movement without damage to connections or members.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify field dimensions prior to fabrication.

3.02 PREPARATION:

A. Clean and strip items to bare metal where site welding is required.

B. Supply setting templates for items required to be placed in partitions. Coordinate work with installer.

3.03 INSTALLATION:

A. Install components plumb and level, accurately fitted, free from distortion or defects.

B. Anchor railings to structure to achieve required structural capacity.

C. Provide anchors, plates, angles, hangers, and struts required for connecting railings to structure.

D. Field weld components indicated on shop drawings. Perform field welding in accordance with AWS D1.1.

E. Field bolt and weld to match shop bolting and welding. Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

F. Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.

G. After erection, prime welds, abrasions, and surfaces not shop primed, galvanized, or prefinished, except surfaces to be in contact with concrete.

3.04 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: ¼ inch per story, non-cumulative.

B. Maximum Offset from True Alignment: ¼ inch.

END OF SECTION

SECTION 06 0573 – WOOD TREATMENT

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Preservative treatment of wood.
   2. Fire retardant treatment of wood.

B. Related Requirements:
   1. Section 06 1050 – Miscellaneous Rough Carpentry.
   2. Section 06 1600 – Sheathing.

PART 2 PRODUCTS

2.01 PRESERVATIVE TREATMENT:

A. Wood Preservative (Pressure Treatment): AWPA P5 and AWPA T1; water borne preservative with 0.25 percent retainage. Kiln dry after treatment to specified moisture content, maximum 19 percent.

B. Wood Preservative (Surface Application for Site Treatment and Touch-up): Clear type, compatible with pressure treatment preservative.

2.02 FIRE RETARDANT TREATMENT:

A. Fire Retardant Treated Wood: AWPA P5 and AWPA T1; non-corrosive; treated with chemicals free of halogens, sulfates, ammonium phosphate, and formaldehyde; low hydroscopic level; suitable to receive natural clear oil-based finishes including stains, sealers, and varnishes. Kiln dry after treatment to specified maximum moisture content for lumber, and 15 percent maximum moisture content for plywood.
   1. Lumber: ASTM D5664.
   2. Plywood: ASTM D5516.
   3. Flame Spread Rating: ASTM E84, maximum 25.

PART 3 EXECUTION

3.01 SITE APPLIED WOOD TREATMENT:

A. Apply preservative treatment in accordance with manufacturer's instructions and AWPA M4.

B. Brush apply two coats of preservative treatment on wood in contact with cementitious materials, roofing, and metal flashings.

C. Treat site-sawn cuts in factory treated wood.

D. Allow preservative to dry prior to erecting members.

3.02 SCHEDULES:

A. Preservative Treated Wood Locations: Framing and blocking above grade in contact with cementitious materials, roofing, and metal flashings.
   1. Exterior, Roof, and Parapet Locations: AWPA Use Category UC3B.
   2. Ground Contact Locations: AWPA Use Category UC4A.
   3. Applications Not Otherwise Scheduled: AWPA U1 Table 3-1.

B. Fire Retardant Treated Wood Locations: Framing and sheathing in noncombustible construction types, where required and permitted by applicable building code.
   1. Interior Locations: AWPA Use Category UCFA.
   2. Exterior, Roof, and Parapet Locations: AWPA Use Category UCFB.

END OF SECTION

SECTION 06 1050 – MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Miscellaneous framing.
   2. Roof curbs and perimeter nailers.
   3. Blocking in wall and roof openings.
   4. Concealed wood blocking for support of door stops and holder/stops, operable partitions, toilet and bath accessories, equipment, casework, furnishings, facility services items, and other accessories.

B. Related Requirements:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary enclosures and barriers.
   2. Section 06 0573 – Wood Treatment.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with the following agencies:
   1. Lumber Grading Agency: Certified by ALSC.
   2. Plywood Grading Agency: Certified by APA.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Lumber Grading Rules: AFPA, SPIB, and NLGA.

B. Miscellaneous Framing and Blocking: Southern Pine or Spruce-Pine-Fir, Utility or better grade, 2 to 4 inches thick, 19 percent maximum moisture content.
   1. At Contractor's option, a flexible wood backing plate system fabricated from ¾ inch fire-retardant treated plywood may be used for blocking.
   2. In metal stud frame construction, metal backing in accordance with Section 09 2210 may be used for blocking.

2.02 ACCESSORIES:

A. Fasteners: Hot dipped galvanized steel for treated wood locations, and all exterior locations; unfinished steel elsewhere.

B. Anchors:
   1. Toggle bolt type for anchorage to hollow masonry.
   2. Expansion shield and lag bolt type for anchorage to solid masonry or concrete.
   3. Bolt or ballistic fastener for anchorage to steel.

PART 3 EXECUTION

3.01 FRAMING:

A. Set structural members level and plumb, in correct position. Accurately saw-cut members to seat square on bearings. Fit closely into proper location.

B. Frame, anchor, tie, and brace members to develop strength and rigidity required for intended purposes. Do not stress members in excess of design strength. Secure members permanently in position with proper fastenings to render parts rigid.

C. Place horizontal members with crown side up.

D. Construct load bearing members full length without splices.

E. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

F. Coordinate curb installation with installation of roof deck and support of roof openings, roofing installation, and related construction.

G. Coordinate installation of blocking with requirements of items to be anchored thereto or supported thereby.

END OF SECTION

SECTION 06 1600 – SHEATHING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Sheathing.
   2. Insulating wall sheathing.
   3. Miscellaneous sheathing.

B. Related Requirements:
   1. Section 01 2300 – Alternates.
   2. Section 01 5000 – Temporary Facilities and Controls: Temporary enclosures and barriers.
   3. Section 05 4000 – Cold Formed Metal Framing.
   4. Section 06 0573 – Wood Treatment.
   5. Section 07 2100 – Thermal Insulation.
   6. Section 07 2726 – Fluid Applied Membrane Air Barriers.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with the following agencies:
   1. Lumber Grading Agency: Certified by ALSC.
   2. Plywood Grading Agency: Certified by APA.

B. In lieu of grade stamping exposed to view materials, submit manufacturer's certificate certifying that products meet or exceed specified requirements.

PART 2 PRODUCTS

2.01 SHEATHING MATERIALS: DOC PS 1 or DOC PS 2.

A. Plywood Sheathing: APA Rated Sheathing; fire retardant treated; Span Rating 32/16, Exposure Durability 1; sanded faces; 5/8 inch thick, 48 x 96 inch sized sheets, square edges.

B. Insulating Wall Sheathing: APA Rated Sheathing, 5/8 inch thick, with rigid polyisocyanurate insulation; fire retardant treated; Span Rating 32/16, Exposure Durability 1; sanded faces; 1-5/8 inch total thickness; 48 x 96 inch sized sheets, square edges.

   1. Manufacturers: In accordance with Section 01 6000.
      a. Hunter Panels; Xci Ply.

   2. Performance Requirements:
      a. Water Vapor Permeance: ASTM E96; maximum 1.0 perm.
      b. R Value: ASTM C518, minimum 6.6 at 75 degree F mean temperature.
      c. Compressive Strength of Insulation: ASTM D1621, minimum 20 psi.

3. Seam Tape: Waterproof; type approved by sheathing manufacturer.

C. Miscellaneous Sheathing: APA Rated Sheathing, fire retardant treated, Span Rating 48/24, Exposure Durability 1; sanded faces; thickness as indicated, 48 x 96 inch sized sheets, square edges.

2.02 ACCESSORIES:

A. Fasteners and Anchors: Nails, screws, bolts, nuts and washers.
   1. Exterior Locationsand Treated Wood Locations: Type as recommended for application; hot dip galvanized to ASTM A153 or stainless steel.
   2. Sheathing to Cold-Formed Metal Framing: ASTM C954, with wafer heads and reamer wings; length as recommended by screw manufacturer for application.
   3. Other Fasteners: Type as recommended for application; unfinished steel.
   4. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.

PART 3 EXECUTION

3.01 SHEATHING:

A. Secure sheathing with long dimension perpendicular to framing members and with ends staggered and sheet ends over bearing.

B. Use sheathing clips between sheets between roof framing members. Maintain 1/8 inch space between panels at midspan of truss or rafter space along unsupported sheathing edges.

END OF SECTION

SECTION 06 2000 – FINISH CARPENTRY

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Site fabricated finish carpentry.

B. Related Requirements:
   1. Section 05 5000 – Metal Fabrications: Frames for exterior gates.
   2. Section 06 1050 – Miscellaneous Rough Carpentry: Blocking and support framing.
   3. Section 09 9000 – Painting and Coating.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with AWI 0641 Custom grade.

B. In lieu of grade stamping exposed to view materials, submit manufacturer's certificate certifying that products meet or exceed specified requirements.

1.03 ENVIRONMENTAL REQUIREMENTS: In accordance with Section 01 6000.

A. Protect units from moisture damage.

B. During and after delivery of materials and installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

PART 2 PRODUCTS

2.01 WOOD MATERIALS:

A. Exterior Materials: Western Red Cedar, Clear A grade, nominal dimensions as indicated; kiln dried to 15 percent maximum moisture content.
   1. Exterior Gates: Tongue and groove profile with V-groove both sides, surfaced S4S.

2.02 FABRICATION:

A. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions and dimensions before starting work.

B. Verify adequacy of backing and support framing.

3.02 INSTALLATION:

A. Secure components using appropriate anchorages.

B. Sand work smooth and set exposed fasteners.

C. Apply wood filler in exposed nail and screw indentations.

END OF SECTION

SECTION 06 6116 – SOLID SURFACING FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Window stools.
   2. Countertops.

B. Related Requirements:
   1. Section 06 0500 – Miscellaneous Rough Carpentry: Wood blocking and supports.
   2. Section 07 9200 – Sealants.
   3. Section 12 3000 – Casework.
   4. Division 22 – Plumbing.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate dimensions, adjacent construction, materials, thicknesses, fabrication details, required clearances, field jointing, tolerances, colors, finishes, methods of support, integration of related components, and anchorages.

B. Samples: Submit two samples, 6 x 6 inch in size illustrating color, texture, and finish.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Maintenance Data: Include instructions for repair, stain removal, and surface and gloss restoration.

B. Provide maintenance kit including manufacturer's recommended abrasive cleansers and pads.

1.04 QUALITY ASSURANCE:

A. Fabricator: Company specializing in architectural components with minimum three years documented experience; approved by manufacturer.

B. Fire Performance Characteristics: ASTM E84, Class I.
   1. Flame Spread: Maximum 25.
   2. Smoke Developed: Maximum 450.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Protect components from damage by retaining shipping protection in place until installation.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Manufactureres: In accordance with Section 01 6000.
   1. DuPont de Nemours, Inc.; Corian.
   2. Aristech Surfaces.
   3. International Paper, Nevamar Division, Fountainhead.
   4. Wilsonart International, Inc.; Wilsonart Solid Surface.

B. Solid Polymer Surfacing: IAPMO Z124; homogeneous, non-porous polyester/acrylic alloy; not coated, laminated, or of composite construction.
   1. Material shall be stain resistant to domestic chemicals and cleaners.
   2. Superficial damage to a depth of 0.010 inch shall be repairable by sanding and polishing.
   3. Colors: As scheduled and as selected.

2.02 FABRICATED UNITS:

A. Window Stools: Solid polymer; size and shape as detailed; semigloss finish.

B. Countertops: Solid polymer; dimensions and configuration as detailed; ¾ inch thick, on wood particleboard substrate; eased edges; semigloss finish.
   1. Backspashes and Side Splashes: 4 inches high; construction and finish to match countertop.

2.03 ACCESSORIES:

A. Sealant: Silicone; mildew resistant; color to match material; for sealing perimeter to adjacent construction.

B. Joint Adhesive: Two component type; color to match material; to create inconspicuous, non-porous joints, with a chemical bond.

C. Sink Mounting Hardware: Manufacturer's approved bowl clips, brass inserts and fasteners.

2.04 FABRICATION:

A. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's requirements.

B. Fabricate each window stool as a single unit without joints.

C. Form joints between components using manufacturer's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Reinforce underside of joint with 2 inch wide strip of surfacing material.

D. Provide holes and cutouts for grommets, hardware, and plumbing fixtures as indicated.

E. Rout and finish component edges to smooth, uniform finish. Rout all cutouts, then sand edges smooth. Repair or reject defective or inaccurate work.

F. Finish surfaces to uniform finish as scheduled.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that substrate is ready to receive work and dimensions are as indicated on shop drawings.

3.02 INSTALLATION:

A. Install fabrications in accordance with shop drawings and fabricator's instructions.

B. Install components plumb and level, scribed to adjacent finishes.

C. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.

D. Provide blocking as required for complete installation and proper anchorage of components.

E. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Replace stained components.

F. Seal joints between components and dissimilar materials in accordance with Section 07 9200, with sealant recommended by manufacturer.

G. Coordinate installation of sinks, faucets, and trim with plumbing installer.

3.03 TOLERANCES:

A. Maximum Variation from True Position: 1/4 inch.

B. Maximum Offset from True Alignment: 1/8 inch.

3.04 CLEANING: In accordance with Section 01 7700.

A. Clean components of foreign material without damaging finished surface.

B. Clean fabrications in accordance with fabricator's instructions.

3.05 PROTECTION OF FINISHED WORK:

A. Place protective covering over installed units. Maintain in place until substantial completion.

END OF SECTION

SECTION 07 1400 – FLUID APPLIED WATERPROOFING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Fluid applied rubber polymer waterproofing.

B. Related Requirements:
   1. Section 03 3000 – Cast-in-Place Concrete: Concrete foundation substrate.
   2. Section 31 2000 – Earth Moving: Backfilling.
   3. Section 33 4113 – Foundation Drainage.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate required flashings, sealing at openings, projections, penetrations, reglets, sealants, and waterproofing of holes, slots, sleeves, and accessories.

B. Product Data: Provide product criteria, characteristics, and accessories.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with NRCA Waterproofing Manual.

B. Installer: Company specializing in performing the work of this section with minimum five years documented experience; approved by manufacturer.

1.04 ENVIRONMENTAL REQUIREMENTS:

A. Follow manufacturer's recommendations for cold weather application (below 40 degrees F). Maintain ambient temperatures above 20 degrees F for 24 hours before and during application.

B. Install subsequent construction, backfill, or temporary protection within 30 days after waterproofing application.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. GCP Applied Technologies; Procor 75.

B. Mar-Flex Systems, Inc.; Mar-Flex Pro.

C. Rubber Polymer Corporation; Rub-R-Wall.

D. Tremco, Inc.; Tremproof 260.

2.02 MATERIALS:

A. Waterproofing: Polymer modified elastomeric membrane.
   1. Density: 6.8 to 8.3 lb/gal.
   2. Elongation: ASTM D412; minimum 500 percent.
   3. Water Vapor Permeance: ASTM E96; maximum 0.21 perms for 40 mil coating.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify substrate surfaces are smooth and durable; free of matter detrimental to application of waterproofing system.

C. Verify items which penetrate surfaces to receive waterproofing are securely installed.

3.02 PREPARATION:

A. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.

B. Remove concrete fins, projections, form ties, and high spots greater than 1/8 inch in height.

C. Patch surface irregularities and voids greater than ½ inch in depth.

D. Seal construction joints, hairline cracks, corners, through wall projections, and penetrations with joint seal.

3.03 APPLICATION:

A. Mix multiple component products in accordance with manufacturer's recommendations.

B. Apply waterproofing in accordance with manufacturer's instructions, using airless spray at recommended application rate, to form a continuous, uniform membrane with a minimum thickness of 0.060 inch. Seal all projections, penetrations, and interruptions.

END OF SECTION

SECTION 07 2100 – THERMAL INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Board insulation.
      a. Foundation and slab insulation.
      b. Wall insulation.
   2. Batt insulation.
   3. Insulating foam sealants and sealing tapes.

B. Related Requirements:
   1. Section 01 2300 – Alternates.
   2. Section 03 3000 – Cast-in-Place Concrete.
   3. Section 05 4000 – Cold Formed Metal Framing.
   4. Section 06 1600 – Sheathing.
   5. Section 07 2216 – Roof Insulation.
   6. Section 07 2726 – Fluid Applied Membrane Air Barriers.
   7. Section 08 4113 – Aluminum Entrances and Storefronts.
   8. Section 09 2210 – Metal Support Systems.
   9. Section 09 8100 – Acoustic Insulation.

1.02 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Attendance: Installer, Contractor, Owner, and Architect.

B. Review methods and procedures related to installation, including approved submittals and manufacturer's written instructions.

C. Review schedule and planned sequence of installation; availability of materials and labor; equipment, facilities, and temporary protection.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit product data for each type of product, indicating compliance with specified performance characteristics and physical properties.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

B. Regulatory Requirements:

   1. Fire Performance Characteristics: Provide insulation materials whose fire performance characteristics have been determined in accordance with the test

methods indicated below, by testing organizations acceptable to regulatory agencies having jurisdiction.

a. Surface Burning Characteristics: ASTM E84.
   (1) Flame Spread Index: Maximum 75.
   (2) Smoke Developed Index: Maximum 450.
b. Fire Resistance Ratings: ASTM E119.
c. Combustion Characteristics: ASTM E136.

2. CFC Compliance: Provide insulation materials which are not produced with, and do not contain, CFC compounds regulated by the U.S. Environmental Protection Agency.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Deliver materials in manufacturer's original, unopened, undamaged packaging with identification labels intact. Store materials protected from exposure to harmful conditions.

B. Handle boards carefully so corners are not broken off or boards otherwise damaged.

C. Shield boards from exposure to direct sunlight with opaque light-colored tarp.

PART 2 PRODUCTS

2.01 BOARD INSULATION:

A. Foundation Perimeter Insulation: ASTM C578, Type IV, rigid extruded polystyrene board.

1. Manufacturers: In accordance with Section 01 6000.
   a. DuPont de Nemours, Inc.; Styrofoam SE.
   b. Kingspan Insulation LLC; GreenGuard CM.
   c. Owens Corning; Foamular 250.

2. Board Size: 2 inches thick; 24 x 96 inch sheets; square edges.

3. R Value: ASTM C518, minimum 5.0 per inch at 75 degree F mean temperature.

B. Wall Insulation: ASTM C578, Type IV, rigid extruded polystyrene board.

1. Manufacturers: In accordance with Section 01 6000.
   a. DuPont de Nemours, Inc.; Styrofoam Cavitymate Plus.
   b. Kingspan Insulation LLC; GreenGuard Scoreboard.
   c. Owens Corning; Foamular 250.

2. Board Size: 1 inch thick; square edges; 16 x 96 inch sheets, or 48 x 96 inch sheets scored at 16 and 24 inches o.c.

3. R Value: ASTM C518, minimum 5.0 per inch at 75 degree F mean temperature.

4. Joint Tape: Provided by or approved by insulation board manufacturer.

2.02 BATT INSULATION:

A. Fiberglass Batt Insulation: ASTM C665, Type I; unfaced.

1. Manufacturers: In accordance with Section 01 6000.
   a. CertainTeed Corporation; Building Insulation.
   b. Johns Manville Building Insulation; Formaldehyde-Free Building Insulation.
   c. Knauf Insulation GmbH.
   d. Owens Corning; EcoTouch Pink.

2. Size: Width as required by framing member spacing; manufacturer's standard lengths.

3. Thickness and R Value: As indicated on the Drawings.
   a. 3½ inch thickness: R-13.
   b. 6 inch thickness: R-19.

B. Wall Head Insulation at Metal Deck: As specified in Section 07 8400.

2.03 INSULATING FOAM SEALANTS AND SEALING TAPES:

A. Insulating Foam Sealants: ASTM C1029, Type II; ASTM C1620; FGIA 812; single component, minimal expanding, low pressure build, semi-rigid closed cell polyurethane foam.

1. Manufacturers: In accordance with Section 01 6000.
   a. DuPont de Nemours, Inc.; Great Stuff Pro.
   b. Hilti Corp.; CF-812.
   c. Tremco, Inc.; TremGlaze LEF or ExoAir LEF.

2. Density: ASTM D1622; minimum 1.5 pcf.

B. Sealing Tapes: FGIA 711; flexible, self-sealing, self-healing, fully adhering membrane flashing with butyl or rubberized asphalt adhesive; minimum 0.025 inch thick; minimum 4 inch width or as required for application.

1. Manufacturers: In accordance with Section 01 6000.
   a. DuPont de Nemours, Inc.; StraightFlash.
   b. GCP Applied Technologies; Perm-A-Barrier.
   c. Henry Co.; Blueskin SA.
   d. Protecto Wrap Co.; BT25XL.
   e. W. R. Meadows, Inc.; Air-Shield.

2. Water Vapor Permeance: ASTM E96; maximum 0.02 perm.

3. Accessories: Provide surface conditioner and primer approved by manufacturer.

2.04 ACCESSORIES:

A. Adhesive: Type recommended by insulation manufacturer.

B. Mechanical Fasteners: Type recommended by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Site Verification of Conditions: Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.

B. Verify substrate and adjacent materials are flat and free of irregularities and foreign materials that may impede adhesive bond, and within manufacturer's recommended temperature range.

C. Verify floor slab grade is well tamped, drained and covered with specified vapor retarder.

3.02 INSTALLATION:

A. General:
   1. Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions.
   2. Install building insulation to comply with thermal and acoustical requirements.
   3. Fit insulation to areas and conditions required, to form a complete thermal barrier around indicated areas without voids.
   4. Coordinate insulation installation over or within three inches of lighting fixtures, fans, or other heat-generating electrical devices with manufacturer's recommendations and regulations of authorities having jurisdiction.

B. Foundation Perimeter Insulation: Place insulation boards with long edge horizontally or vertically on the interior foundation wall from a point establishing the top of the proposed floor as indicated on the Drawings. Taper top of insulation at a minimum 60 degree angle.
   1. Secure boards to the foundation wall with adhesive. Apply 2 inch diameter spots of adhesive to insulation boards 16 inches o.c. both ways.
   2. Butt edges and ends tight to adjacent board and to protrusions. Stagger end joints.
   3. Cut insulation to fit snugly around pilasters, projections, and irregularities on the wall surface. Fill voids with insulation.

C. Rigid Wall Insulation:
   1. Framed Substrate: Apply insulation boards horizontally. Secure to framing members with fasteners; do not exceed manufacturer's recommended maximum spacing for application.
   2. Tape joints and seams with manufacturer's recommended joint tape.

D. Batt Insulation: Friction fit batts between framing members, installed neatly around and behind electrical boxes, vent piping, duct work, and other obstructions. Butt insulation tight, covering the entire area without voids.
   1. Pack loose insulation in narrow spaces where fasteners cannot be installed, to ensure complete insulation coverage.
   2. Exterior Soffits: Loose lay insulation above suspended soffit system. Butt insulation pieces together tightly to avoid thermal and acoustical short circuit.

E. Insulating Foam Sealants: Apply in accordance with manufacturer's recommendations to voids between door and window frames and adjacent construction, perimeter of roof penetrations (except flues), and similar cavities in thermal assemblies.
   1. Clean surfaces prior to application; remove oil and chemical substances that may prevent adhesion.
   2. Protect adjacent surfaces subject to damage from overspray or accidental contact.
   3. After initial curing, trim and remove excess material. Apply joint sealant or other protective material promptly to limit ultraviolet exposure.
   4. After final curing, operate window or door to confirm proper operation. Correct binding and distortion caused by overfilling or expansion.

F. Sealing Tapes: Apply in accordance with manufacturer's recommendations and ASTM E2112 to perimeter of door and window frames; seal to adjacent construction. Extend onto face of wall minimum 3 inches or as required by manufacturer's recommendations.
   1. Test surface for adhesion; apply surface conditioner and primer where necessary.
   2. Remove and discard release paper from self-adhesive tape. Position each piece carefully and press firmly into place with hand roller, giving special attention to edges, seams, and penetrations. Fully adhere tape to substrate to prevent water from migrating under tape.

3.03 PROTECTION:

A. Protect installed products from harmful weather exposure and physical abuse, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazard.

END OF SECTION

SECTION 07 2216 – ROOF INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Roof insulation.
   2. Vapor retarders for roof assemblies.

B. Related Requirements:
   1. Section 05 3123 – Steel Roof Decking.
   2. Section 06 1050 – Miscellaneous Rough Carpentry: Wood nailers, curbs, and blocking.
   3. Section 07 5000 – Membrane Roofing.
   4. Section 07 6100 – Sheet Metal Roofing.
   5. Section 07 7600 – Roof Pavers.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate tapered insulation layout plan.

B. Product Data: Submit for each type of product, indicating conformance with specified performance characteristics and physical properties.

1.03 ENVIRONMENTAL REQUIREMENTS:

A. Do not apply roofing system components during inclement weather, or to damp or frozen surfaces.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.04 WARRANTY: In accordance with Section 01 7700.

A. Coordinate with Section 07 5000 to ensure that insulation is included in the roof membrane manufacturer warranty.

PART 2 PRODUCTS

2.01 ROOF INSULATION BOARD:

A. Manufacturers: In accordance with Section 01 6000.
   1. Manufacturer of membrane roofing in accordance with Section 07 5000.
   2. Atlas Energy Products; ACFoam-II.
   3. Holcim Building Envelope; Elevate ISO 95+ GL.
   4. Hunter Panels; H-Shield.
   5. Johns Manville Roofing Systems; ENRGY 3.

B. General Requirements: Selected from listed manufacturers and products, and meeting all of the following criteria:
   1. Approved by roof system manufacturer for the specified warranty coverage.
   2. UL and FM approved in combination with membrane material.
   3. Approved by applicable building code agency.
   4. Listed for use in Class A roofing assemblies without use of separate thermal barrier.
   5. All roof insulation shall be of the same type and manufacturer.

C. Polyisocyanurate Insulation: ASTM C1289, Type II; rigid board, both faces surfaced with glass fiber mat facer; produced with non-HCFC blowing agent.
   1. Board Configuration: 48 x 96 inches or 24 x 96 inches; square edges. For adhesive application, maximum board dimension shall be 48 inches.
   2. Board Thickness: As indicated, and as required to meet R and LTTR values.
      a. LTTR Value: ASTM C1289, 15 year time weighted average; minimum 5.6 per inch.
   3. Density: ASTM D1622, nominal 2.0 lb/cu ft.
   4. Compressive Strength: ASTM D1621, minimum 20 psi.
      a. Roof Paver Locations: Minimum 60 psi.
   5. Tapered Insulation: Custom fabricated to slope indicated on Drawings. Apply in multiple layers when recommended by manufacturer.
      a. Minimum Thickness: ¾ inch at lowest point. Maintain specified minimum R and LTTR values except at roof drains.

2.02 VAPOR RETARDERS:

A. Reinforced Vapor Retarder for Roof Assemblies: Non-woven nylon, fiberglass, or polyester scrim laminated between two layers of polyethylene, polyester, or polypropylene; minimum 6 mil nominal thickness; fire rated type where required by roof assembly classification; largest practical widths to minimize seams. Materials shall be approved by the roofing manufacturer.

   1. Manufacturers: In accordance with Section 01 6000.
      a. Reef Industries, Inc.; Griffolyn Type 65.
      b. Lamtec Corp.; WMP-VR-R Plus.
      c. Viaflex; Dura-Skrim.
      d. Manufacturer of roofing system.

   2. Water Vapor Permeance: ASTM E96; maximum 0.05 perm.

   3. Accessories: Factory fabricated pipe boots.

B. Vapor Retarder Tape: Pressure sensitive self-adhesive type for sealing joints and penetrations; approved by vapor retarder manufacturer.

2.03 ACCESSORIES:

A. Insulation Fasteners: Hot dipped galvanized steel; appropriate for purpose intended; approved by Factory Mutual and system manufacturer in combination with roof deck

and insulation type; with smooth edge plates or anchor bars designed to prevent fastener backout.

1. Length: As required for thickness of material, including substrate board where used, and ¾ inch deck penetration.
2. Where deck is scheduled to be exposed from occupiable space below, fastener length must be less than the sum of the nominal deck height and the thickness of materials above deck.

B. Insulation Adhesive: Two component low-rise adhesive for spray application, as approved by roofing manufacturer and insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify surfaces are dry and free of snow and ice.

B. Verify deck is supported and secure, clean and smooth, free of depressions, waves, or projections, properly sloped as indicated on Drawings.

3.02 PREPARATION:

A. Clean substrate of dust, debris, and other foreign substances.

3.03 INSTALLATION:

A. Loose lay vapor retarder in a single layer over entire roof area extending to roof edges and perimeter walls and parapets. Extend vapor retarder to extremities of areas to be protected from vapor transmission. Firmly attach vapor retarder to substrates with adhesives as recommended by vapor retarder manufacturer. Locate joints over solid substrates.

1. Provide minimum 2 inch side laps and 6 inch end laps. Seal overlapping joints, perimeter joints, openings and fastener penetrations with continuous strip of vapor retarder tape to form a continuous vapor retarder assembly. Seal joints airtight at penetrations.
2. Repair tears and punctures in vapor retarders immediately before concealment by other work. Cover with vapor retarder tape or another layer of vapor retarder.
3. Install boots at pipe penetrations; seal in accordance with manufacturer's instructions.

B. Place insulation in accordance with insulation manufacturer's instructions and roofing manufacturer's recommendations.

C. Place insulation board in minimum two layers with joints offset minimum 12 inches from joints of adjacent layers. Mechanically fasten or adhere each layer to substrate at

Contractor's option in accordance with insulation manufacturer's instructions and roof system warranty requirements.

1. Mechanical Application: Fastener density in accordance with Factory Mutual requirements; increase fastener density at corners and perimeters.
2. Adhered Application: For each layer, spray uniform coat of adhesive to substrate at manufacturer's recommended rate. Set insulation board into adhesive using uniform pressure.

D. Tapered Insulation: Place to the required slope pattern in accordance with shop drawing layout and manufacturer's instructions.
   1. Where multiple layers are required, place layers with joints offset minimum 12 inches from joints of adjacent layers.
   2. Lay tapered boards for a minimum distance of 24 inches back from roof drains for positive drainage.

E. Place boards perpendicular to deck flutes with edges over flute surface for bearing support.

F. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof. Do not allow gaps between adjacent boards, or between boards and adjacent components.

G. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the day.

H. Inspect completed insulation work for damage, including moisture, cupping, warping, and physical harm. Replace damaged materials.

END OF SECTION

SECTION 07 2726 – FLUID APPLIED MEMBRANE AIR BARRIERS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Fluid applied membrane air barrier and vapor retarder.

B. Related Requirements:
   1. Section 06 1600 – Sheathing: Wood sheathing substrate.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate required flashings, sealing at openings, projections, penetrations, reglets, sealants, and waterproofing of holes, slots, sleeves, and accessories.

B. Product Data: Provide product criteria, characteristics, and accessories.

1.03 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience; approved by manufacturer.

1.04 ENVIRONMENTAL REQUIREMENTS:

A. Store Products within the temperature range specified by manufacturer; protect from freezing and direct sunlight.

B. Apply membrane within the weather conditions and range of ambient and substrate temperatures specified by manufacturer.

C. Install subsequent construction or temporary protection within 30 days after application.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Tremco, Inc.; ExoAir 120.

B. Henry Co.; Air Bloc 06 WB.

C. Hohmann & Barnard; Enviro-Barrier.

D. Master Builders Solutions; MasterSeal AWB 660 I.

E. ProSoCo, Inc.; R-Guard VB.

F. W. R. Meadows, Inc.; Air-Shield LSR.

2.02 MATERIALS:

A. Fluid Applied Membrane Air Barriers: Polymer modified water based coating.
   1. Air Permeance: ASTM E2178; maximum 0.004 cfm/sq ft at 1.57 psf static air pressure differential.
   2. Water Vapor Permeance: ASTM E96; maximum 0.10 perms.
   3. Low Temperature Flexibility: ASTM C836; no crack or loss of adhesion at -23 degrees C.

B. Accessories: Transition membranes, flashings, primers, and mastics; as recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify substrate surfaces are smooth, durable, clean, and dry; free of dust, mud, loose mortar, sand, soil, frost, or other matter detrimental to application of membrane.

C. Verify items which penetrate surfaces to receive coating are securely installed.

D. Verify wood sheathing is firmly secured to framing members.

3.02 PREPARATION:

A. Clean and prepare surfaces to receive coating in accordance with manufacturer's instructions.

B. Patch surface irregularities and voids greater than ½ inch in depth.

C. Seal construction joints, cracks, voids, through wall projections, and penetrations with joint seal or non-shrink grout as recommended by manufacturer.

D. Apply primer to substrate where recommended.

3.03 APPLICATION:

A. Apply coating in accordance with manufacturer's instructions, using airless spray with multiple overlapping passes at an application rate of approximately 25 sq ft/gal, or as recommended by manufacturer.

B. Apply coating to form a continuous, uniform membrane with a minimum dry film thickness of 0.040 inch. Seal all projections, penetrations, and interruptions.

C. Seal transitions and terminations with membrane flashings and metal fabrications in accordance with manufacturer's recommendations.

D. Touch up, repair, or replace damaged work.

END OF SECTION

SECTION 07 4619 – STEEL SIDING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Steel siding.

B. Related Requirements:
   1. Section 06 1600 – Sheathing.
   2. Section 07 2100 – Thermal Insulation.
   3. Section 07 2726 – Fluid Applied Membrane Air Barriers.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate material characteristics, performance criteria, limitations, installation instructions and procedures.

B. Samples: Submit full range of color samples for selection.

1.03 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Maintain cartons flat, supported along their entire length.

B. Store in clean, dry location protected from direct sunlight, in temperatures not exceeding 120 degrees F.

1.04 WARRANTY: In accordance with Section 01 7700.

A. Provide manufacturer's standard non-prorated warranty for siding materials, minimum 40 years, including coverage against fading and chalking.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel: ASTM A653; galvanized to G90 designation.

2.02 COMPONENTS:

A. Manufacturers: In accordance with Section 01 6000.
   1. MAC Metal Architectural; Harrywood.

B. Siding: 12 ft length; 6 x 3/8 inch profile; 24 gauge; color as selected.

C. Trim and Accessories: Material to match siding; manufacturer's standard style to match appearance indicated on Drawings; concealed fasteners.

D. Fasteners: Manufacturer's recommended type; of sufficient length to penetrate through sheathing and at least ¾ inch into wall studs.
   1. Nails: Hot dipped galvanized; 3/8 inch head.

2. Staples: Minimum 16 gauge, elliptical cross section; 1/16 inch crown.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify wall substrate and sheathing is straight, flat and smooth.

B. Verify that air and vapor seal materials are installed and joints and seams are properly treated.

3.02 INSTALLATION:

A. Install Products in accordance with manufacturer's instructions; square, plumb, level, and proper elevations, and in alignment with other work.

B. Space fasteners 16 inches o.c. Locate fasteners in center of slot, with 1/32 to 1/16 inch space between fastener and nailing hem, to allow siding to expand and contract freely.

C. Allow 1/4 to 3/8 inch clearance where siding meets trim and other accessories, and at corners and openings, to allow expansion and contraction without buckling.

D. Lap and interlock panels to conceal fasteners and assure weather-tight installation.

3.03 CLEANING: In accordance with Section 01 7700.

A. Remove dirt, dust, fingerprints, and soiled areas.

END OF SECTION

SECTION 07 4646 – FIBER-CEMENT SIDING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Fiber-cement siding and trim.

B. Related Requirements:
   1. Section 06 1600 – Sheathing.
   2. Section 07 2100 – Thermal Insulation.
   3. Section 07 2726 – Fluid Applied Membrane Air Barriers.
   4. Section 07 9200 – Joint Sealants.
   5. Section 09 9000 – Painting and Coating.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Technical data and material characteristics for each product type.

B. Samples: Indicate actual product, color, and pattern.

1.03 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this Section with minimum two years documented experience.
   1. Installer's personnel shall complete manufacturer's training course prior to beginning installation. Training shall cover installation methods including concealed fastening methods.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials flat on smooth, level surface above ground. Protect edges and corners from chipping. Protect from moisture damage.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Correct defective Work within a 2 year period after Date of Substantial Completion.

B. Manufacturer shall provide a 30 year material warranty against manufacturing defects.

C. Manufacturer shall provide a 15 year paint finish warranty against peeling, cracking, chipping, chalking, and fading.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Fiber-Cement Panels: ASTM C1186, Type A, Grade II.

2.02 COMPONENTS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Basis of Design: James Hardie Building Products, Inc.
   2. Plycem USA, Inc.; Allura.
   3. Nichiha.

B. V-Groove Siding: 12 ft length; 5/8 inch thickness; 8¼ inch with 7 inch exposure; V-groove with locking joints; smooth surface texture; primed for field paint.

C. Lap Siding: 12 ft length; 5/16 inch thickness; width and exposure as selected; surface texture as selected; finish as scheduled.

D. Soffit Panels: 12 ft length; width as required by soffit dimensions; non-vented; ¼ inch thick; surface texture as selected; finish as scheduled.

E. Fiber-Cement Trim and Fascia: Material to match siding; dimensions as indicated.

2.03 FINISHES:

A. Primer: Manufacturer's standard; factory applied to all surfaces.

B. Topcoat: Multi-coat, heat cured; factory applied to all surfaces.
   1. Colors: As selected.
   2. Provide matching paint for field touch-up.

2.04 ACCESSORIES:

A. Fasteners: Stainless steel; manufacturer's recommended type; of sufficient length to penetrate through sheathing and at least ¾ inch into wall studs.

B. Concealed Fastening Tabs: Flat type and corner type, as required by application.

C. Sealant: In accordance with Section 07 9200.

D. Aluminum Trim and Flashing: ASTM B209; minimum 0.050 inch thick; 12 ft lengths; factory prefinished, color as selected.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify wall substrate and sheathing is straight, flat and smooth.

B. Verify that air and vapor seal materials are installed and joints and seams are properly treated.

3.02 PREPARATION:

A. Seal, prime or prefinish both sides, edges, and ends of materials before installation.

3.03 INSTALLATION:

A. Install Products in accordance with manufacturer's instructions; square, plumb, level, and proper elevations, and in alignment with other work.

B. Field cut materials as recommended by manufacturer using methods to minimize dust production and personnel exposure to respirable dust. Do not use power saws indoors. Seal cut edges with compatible primer and finish coat.

C. Attach corner trim, band boards, window and door surrounds, and other trim with concealed fastening tabs, prior to installation of siding. Provide additional blocking where necessary for securement.

D. Maintain recommended edge and end spacing and fastener setback.

E. Align vertical joints over framing members and minimum 16 inches from window and door openings. Flash vertical joints with minimum 6 inch wide flashing, lapped one inch onto course below.

F. Flash and seal penetrations through building enclosure.

G. Field paint materials not factory finished, in accordance with Section 09 9000.

3.04 CLEANING: In accordance with Section 01 7700.

A. Remove dirt, dust, fingerprints, and soiled areas.

B. Touch up fasteners and factory finished surfaces.

END OF SECTION

SECTION 07 5000 – MEMBRANE ROOFING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Fully adhered single ply roof system.

B. Related Requirements:
   1. Section 06 1050 – Miscellaneous Rough Carpentry: Wood nailers, curbs, and blocking.
   2. Section 07 2100 – Thermal Insulation.
   3. Section 07 2216 – Roof Insulation.
   4. Section 07 7100 – Roof Specialties.
   5. Section 07 7233 – Roof Hatches.
   6. Section 07 7600 – Roof Pavers.
   7. Division 22 – Plumbing: Roof drains.
   8. Division 23 – HVAC: Prefabricated curbs for roof mounted equipment.

1.02 DESIGN REQUIREMENTS:

A. Conform to applicable building code for roof assembly fire hazard requirements.

B. ASTM E108/UL 790: Class A Fire Hazard Classification.

C. FM 4470: Roof Assembly Classification, of Class 1 construction, wind uplift requirement of 1-90, in accordance with FM Construction Bulletin 1-28.

D. Ground Roughness Factor: B.

1.03 PERFORMANCE REQUIREMENTS:

A. System Integrity: Roof assembly, including flashings and accessories, shall not permit the passage of liquid water, and shall withstand wind loads, thermally induced movement, and exposure to weather and ultraviolet radiation without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another and with adjacent materials under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate layout of membrane sheets, location and type of field splices; termination, penetration and attachment details showing specific wall and deck construction, entire roof assembly and additional blocking as required; conditions of interface with other materials; walkway layout pattern.
   1. Standard catalog cuts, if used, shall be supplemented by additional detail drawings approved by membrane manufacturer as necessary to show project specific conditions. Submit proof of manufacturer approval to Architect.

2. Field changes to approved shop drawings will not be considered unless accompanied by written approval from membrane manufacturer.

B. Product Data:
   1. Provide characteristics on membrane materials, flashing materials, walkways, and accessories.
   2. Indicate installation requirements for membrane, including procedures and materials for flashing, splicing and bonding.
   3. The membrane manufacturer shall provide the Installer and Architect with a comprehensive listing of chemicals, solutions, oils, compounds, or materials which may be injurious to the sheet membrane, including those materials normally found to exist in the roof environment or likely to occur on this roof.

C. Installer Certificates: Submit evidence of approval, authorization, or license from membrane manufacturer to install specified system, including documentation of specified training. Provide list of completed projects with project names and addresses, and architect and owner contact information.

D. Manufacturer's Approval: Submit membrane manufacturer's approval of all components of the roof assembly, including insulation and roof edge securement; project review and acceptance for warranty, including approval of installer.

E. Warranty Form: At time of shop drawing submittal, submit preliminary copy of manufacturer's warranty.

F. Manufacturer's Field Reports: Submit under provisions of Section 01 4000. Indicate procedures followed, ambient temperatures, humidity, wind velocity during applications, and items requiring corrective action.

1.05 QUALITY ASSURANCE:

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

B. Provide proper attachment of roofing to accessory or related work in contact with, or which becomes an integral part of the roofing or flashing system, including when such accessory or related work is provided under other Sections.

C. Membrane Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.

D. Installer Qualifications: Company specializing in performing the work of this Section with minimum five years documented experience; approved by membrane manufacturer.

   1. Provide adequate number of qualified roofers who are experienced and thoroughly trained in the techniques required to properly install the specified roofing system and related work.

   2. Installer's Project Superintendent shall have experience installing the specified roofing system with minimum 5 years experience on projects of similar size and

scope, shall be familiar with the requirements of this project, and shall provide on-site supervision at all times when roofing system work is in progress. Training shall include completion of membrane manufacturer's in-house training course and on-site training.

E. Preinstallation Meeting: In accordance with Section 01 3100.

1. Schedule after approval of submittals and prior to completion of roof deck installation.

2. Attendance: Installer; Owner; Architect; Owner's insurer, if applicable; membrane manufacturer's representative; installers of roof deck, vapor retarder, insulation, roof specialties and accessories, roof-mounted equipment, and other work interfacing with or affecting roofing.

3. Agenda:
   a. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   b. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   c. Review loading limitations of deck during and after roofing.
   d. Review flashings, special roofing details, roofing drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
   e. Review governing regulations and requirements for insurance, certificates, and inspection and testing, if applicable.
   f. Review temporary protection requirements for roofing system during and after installation.
   g. Review roof observation and repair procedures after roofing installation.

1.06 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Store materials, except membrane, between 60 degrees F and 80 degrees F. If exposed to lower temperature, restore to minimum 60 degrees F before using.

B. Store materials, except membrane, in dry area and protect from water and direct sunlight.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. Do not apply roofing system during inclement weather, or to damp or frozen surfaces.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.08 COORDINATION: In accordance with Section 01 3100.

A. Coordinate the work of this section with that of other sections to assure the timely integration of the work into the building construction.

B. Coordinate the work with installation of associated metal flashings as the work of this section proceeds.

C. Schedule the work to prevent using newly constructed roofing for storage, walking surface, or material or equipment movement.

1.09 WARRANTY: In accordance with Section 01 7700.

A. Correct defective Work within a two year period after Date of Substantial Completion for damage resulting from failure to prevent penetration of water.

B. Provide 20 year manufacturer "total system" warranty without dollar amount limitation for roofing assembly including insulation, flashing, roof edge securement, and accessories, covering leaks, failures, and wind damage.

1. Coordinate with Sections 07 2216 and 07 7100, and related sections, to ensure that insulation, roof edge securement, and accessories are included in warranty.

C. Warranty Coverage Requirements:

1. Wind Speed Coverage: 72 mph, measured at 10 meters above ground. Reference to "gale force winds" or similar language without a specific wind speed and elevation will not be accepted.

2. Warranty claims may be excluded only for the following:
   a. Abuse or misuse of roof system by the Owner.
   b. Acts of God and other "natural disasters" except wind as limited above.
   c. Fire (after occupancy).

3. Warranty coverage shall commence on date of inspection and approval by manufacturer's representative. After inspection and approval, warranty exclusions for improper design and installation will not be accepted.

4. Warranty provisions requiring Owner to provide notice of leaks to manufacturer shall allow a minimum time period of 30 days for such notice.

5. For warranty repair work, provide full labor and materials required to restore roof system to weathertight condition without cost to the Owner.

PART 2 PRODUCTS

2.01 MEMBRANE MANUFACTURERS: In accordance with Section 01 6000.

A. Carlisle Syntec Incorporated; Sure-Weld GSD Adhered Roofing System.

B. Genflex Roofing Systems, LLC; GenFlex TPO Fully Adhered Roof System.

C. Holcim Building Envelope; Elevate UltraPly TPO Fully Adhered Roofing System or TPO-SA Self Adhering Roofing System.

D. Johns Manville Roofing Systems; TPO Fully Adhered Membrane System.

E. Versico Incorporated; Versiweld GSD Adhered Roofing System.

2.02 MEMBRANE MATERIALS:

A. TPO (Thermoplastic Polyolefin) Membrane: ASTM D6878; polyester reinforced; white color, non-halogenated formulation; minimum 0.060 inch nominal thickness.

1. Provide fire retardant membrane where required to meet specified fire hazard classification in combination with the membrane type, insulation type, roof slope, and related project conditions.

2. Provide membrane in largest sheet lengths possible as determined by job conditions.
   a. Factory Welded Seams: Minimum sheet width 60 inches.
   b. Field Welded Seams: Minimum sheet width 75 inches. Use half width sheet size at roof perimeter.

3. Performance Requirements: Membrane materials shall conform to the minimum physical properties published in the roofing system manufacturer's product literature where they exceed the following values.
   a. Breaking Strength: ASTM D751; minimum 200 lbf.
   b. Tearing Strength: ASTM D751; minimum 45 lbf.
   c. Thickness Over Reinforcing Scrim: ASTM D6754; minimum 0.016 inch, top and bottom.
   d. Water Absorption: ASTM D471; maximum 2.0 percent.
   e. Linear Dimensional Change: ASTM D1204; maximum 0.5 percent.
   f. Low Temperature Brittleness: ASTM D2136 or D2137; pass at –45 degrees F.
   g. Puncture Resistance: ASTM D5602; minimum 350 lbf.
   h. Elongation at Break: ASTM D751; minimum 25 percent.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Flexible Flashings: Same material as membrane; minimum 0.060 inch thick.

D. Stack Boots: Flexible boot and collar with clamps for pipe stacks through membrane.

2.03 ACCESSORIES:

A. Provide bonding adhesive, splicing cement, cleaner, primer, lap sealant, water cut-off mastic, prefabricated pipe seals, overnight seal, pourable sealer, anchor bars and other related items as recommended and furnished by the membrane manufacturer for conditions of construction and as required for warranty and performance requirements.
   1. Fully Adhered Systems: Adhesive may be factory applied or field applied.

B. Rubber Walkways: 24 x 24 x 1½ inch thick, or membrane manufacturer's nearest standard size, with radius corners; with protection membrane.

C. Temporary Protection: Polyethylene sheet, fiber reinforced plastic sheet, or other materials with equivalent weather resistance; provide weights to retain sheeting in position.

D. Provide additional accessories, such as preservative treated wood blocking, where required by manufacturer's standards, even when not otherwise indicated or specified.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that surfaces and site conditions are ready to receive work and that no conditions exist which may adversely affect installation, permanence, or quality of work.

B. Verify that blocking, curbs, and nailers are installed at required locations and securely anchored.

C. Verify substrate is clean and smooth, free of depressions, waves, or projections, properly sloped as indicated on Drawings.

D. Verify surfaces are dry and free of snow and ice.

E. Verify roof openings, curbs, pipes, sleeves, and vents through roof are solidly set, and required accessories are in place.

F. Apply insulating foam sealant to perimeter voids at roof penetrations (except flues) in accordance with Section 07 2100 to maintain continuity of thermal barrier.

G. Verify that no substances listed in the contamination profile exist on the roofing area which cannot be positively isolated from the membrane.

H. Verify that manufacturer's approval of all roof components has been obtained prior to beginning work.

3.02 PREPARATION:

A. Do not place materials on the roof in a manner which would cause induced loads to exceed the roof deck design load at any point.

B. Clean substrate of dust, debris, and other foreign substances. Remove sharp projections.

C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof drain plugs when no roof work is taking place or when rain is forecast.

3.03 MEMBRANE APPLICATION:

A. Install membrane in accordance with manufacturer's recommended procedures, specifications, approved shop drawings, and observing manufacturer's cautions and as required to meet or exceed specified wind rating.

B. Isolate all materials and substances which may have a detrimental effect on the membrane.

C. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

D. Shingle joints on sloped substrate in direction of drainage.

E. Accurately align sheets and maintain uniform side and end laps of dimensions required by manufacturer, minimum 3 inches. Stagger end laps. Seal permanently waterproof using methods approved by manufacturer. Manually verify entire length of each seam for voids and deficiencies; correct as recommended by manufacturer.
   1. Heat Welding: Use approved automatic heat welding equipment. In areas inaccessible to machine, use hand held heat gun and teflon roller.

F. Securely fasten membrane at terminations and perimeter. Provide base flashing at perimeters and edges of membrane abutting parapets, walls, curbs, or other construction. Provide prefabricated pipe seals for pipe and conduit penetrations, properly cemented to membrane and sealed to pipe or conduit with stainless steel clamp and top bead of sealant.
   1. At parapets adjacent to roof, extend base flashing or membrane up parapet, over top of wall, and terminate approximately 2 inches down the opposite side.
   2. At independent parapets, provide membrane flashing over top of wall and extend down both sides approximately 2 inches.
   3. Counter flash gravel stops, cap flashing and copings with membrane lap flashing.

G. Install rubber walkways at all traffic concentration points (roof hatches, access doors, rooftop HVAC equipment, and similar locations) regardless of traffic frequency. Discontinue walkways over flashing or field seams for inspection purposes. Adhere pads to continuous protective membrane, which is fully adhered to primary roofing membrane.
   1. Provide minimum 2 inch and maximum 6 inch spaces between walkway components for roof drainage.

H. Coordinate installation of roof drains, sumps, and related flashings.

I. Install accessories and related items in accordance with manufacturer's instructions.

J. Seal flashings and flanges of items penetrating membrane.

3.04 DAILY SEAL:

A. Temporarily seal loose edges of membrane with overnight seal. Ensure that water does not flow beneath completed sections of the membrane system.
   1. Mix the two components thoroughly according to the instructions on the label.
   2. Apply the overnight seal in accordance with manufacturer's recommendations. If necessary, use a trowel to spread material to achieve complete seal.
   3. After embedding membrane in overnight seal, check for continuous contact. Weight the edge, providing continuous pressure over the length of the cutoff, with 2½ inch rubber tubing filled with dry sand.
   4. When work is resumed, pull sheet free before continuing installation.

3.05 FIELD QUALITY CONTROL:

A. Inspection: Manufacturer's representative shall inspect installation minimum 3 times during progress of the work or biweekly, whichever is more frequent, and certify compliance with manufacturer's installation requirements.

B. Correct identified defects or irregularities.

3.06 PROTECTION: In accordance with Section 01 7000.

A. Perform progress cleaning daily. Do not burn debris on the site. Dispose of all rubbish and scrap materials off-site in a legal manner.

B. Protect landscaping, lawn areas, walks and drives, and building surfaces.

C. Provide barricades, covered walkways and traffic direction as required to prevent personal injury.

D. Where traffic must continue over finished roof membrane, protect surfaces.

E. Coordinate and pay for repairs to existing components and the work of other sections damaged by performance of the work.

F. Correct deficiencies and perform repairs as necessary to restore roofing system to a condition free of damage and deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 07 6100 – SHEET METAL ROOFING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Standing seam metal roofing.
   2. Metal soffit panels.
   3. Related flashing and accessories.

B. Related Requirements:
   1. Section 05 3123 – Steel Roof Decking.
   2. Section 05 4000 – Cold Formed Metal Framing: Light gauge metal framing and roof trusses.
   3. Section 06 1050 – Miscellaneous Rough Carpentry: Wood blocking.
   4. Section 06 1600 – Sheathing.
   5. Section 07 7100 – Roof Specialties.
   6. Section 07 9200 – Joint Sealants.
   7. Division 22 – Plumbing: Roof penetrations.
   8. Division 26 – Electrical: Grounding and bonding.

1.02 PERFORMANCE REQUIREMENTS:

A. Wind Uplift Rating: ASTM E1592 and UL 580, Class UL 90.

B. Static Air Infiltration: ASTM E283; maximum 0.06 CFM/sq ft with 6.24 psf air pressure differential.

C. Water Penetration: ASTM E331; none, at inward static air pressure differential of minimum 6.24 psf and maximum 12.00 psf.

D. Design panels to support design live loads and roof traffic during construction.

E. Provide for expansion and contraction of roof assembly without detrimental effect on materials when ambient air temperature varies 100 degrees F in 24 hours.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate panel layout, edge details, joints, corners, panel profiles, clip spacings and loads, trim, flashing, and special details. Show details of weatherproofing, terminations, and penetrations of metal work. Distinguish between factory and field assembly work.
   1. Snow Guards: Indicate number of rows and spacing of rows at each location, in accordance with snow guard manufacturer's design.
   2. Provide calculations, sealed by a Professional Engineer experienced in design of this work and licensed at the place where the Project is located, indicating that roof

panel and attachment method resists wind pressures imposed on it in accordance with applicable building code and loads indicated on Drawings.

3. Submit shop drawings to manufacturer for approval. Submit proof of approval to Architect.
4. Field changes to approved shop drawings will not be considered unless accompanied by written approval from manufacturer.

B. Product Data: Indicate underlayment and accessories.

C. Samples:
1. Metal Panels: Submit sample panels 12 inches long by actual width of each type of panel, minimum two panel sections with finished seam. Illustrate gauge, finish, color and texture.
2. Snow Guards: Submit two units for approval.

D. Installer Certificates: Submit evidence of approval, authorization, or license from manufacturer to install specified system. Include list of completed projects with project names and addresses, and architect and owner contact information. Include documentation of specified training.

E. Warranty Form: At time of shop drawing and sample submittal, submit preliminary copy of manufacturer's warranty, including evidence of application for warranty and manufacturer's acceptance of the applicator and warranty conditions.

F. Manufacturer's Field Reports: Submit under provisions of Section 01 4000. Indicate procedures followed, ambient temperatures, humidity, and items requiring corrective action.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this Section with minimum five years documented experience; approved by manufacturer.
1. Provide adequate number of qualified roofers who are experienced and thoroughly trained in the techniques required to properly install the specified roofing system and related work.
2. Installer's Project Superintendent shall have experience installing the specified roofing system with minimum 5 years experience on projects of similar size and scope, shall be familiar with the requirements of this project, and shall provide on-site supervision at all times when roofing system work is in progress. Training shall include completion of manufacturer's in-house training course and on-site training.

B. Preinstallation Meeting: In accordance with Section 01 3100.
1. Schedule after approval of submittals and prior to completion of roof deck installation.
2. Attendance: Installer; Owner; Architect; Owner's insurer, if applicable; manufacturer's representative; installers of substrate, roof specialties and accessories, roof-mounted equipment, and other work interfacing with or affecting roofing.

3. Review methods and procedures related to roofing installation, including approved submittals and manufacturer's written instructions.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review loading limitations of deck during and after roofing.
6. Review flashings, special roofing details, roofing drainage, roof penetrations, and condition of other construction that will affect roofing.
7. Review governing regulations and requirements for insurance, certificates, and inspection and testing, if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review schedule and planned sequence of mockups and roofing installation.
10. Review roof observation and repair procedures after roofing installation.

C. Mock-Ups: Construct full-size mockups, minimum 24 inches in size, of each perimeter, valley, ridge, penetration, and flashing condition. Include all components and accessories.
   1. Construct mockups under the full-time, on site direction of the manufacturer's representative. Provide minimum 72 hours notice to, and allow observation of mockup construction by, the Architect and Owner.
   2. Submit written approval of mockups by manufacturer's representative prior to proceeding with remainder of work. Approved mockups will become the standard of workmanship for the project.
   3. Mockups may not be incorporated into final construction unless specifically approved in advance. Locate mockups to remain as long as possible before removal becomes necessary.

1.05 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Stack prefinished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture run-off.

B. Store materials in a safe, dry, above-ground location.

C. Prevent contact with material that may cause corrosion, discoloration or staining.

D. Protect materials with strippable film from exposure to direct sunlight or extreme heat.

E. Protect materials and installations from damage by other trades.

F. Do not allow material storage or traffic on installed panel surface.

1.06 COORDINATION: In accordance with Section 01 3100.

A. Coordinate the work of this section with that of other sections to assure the timely integration of the work into the building construction.

B. Coordinate the work with installation of associated metal flashings as the work of this section proceeds.

C. Schedule the work to prevent using newly constructed roofing for storage, walking surface, or material or equipment movement.

1.07 WARRANTY: In accordance with Section 01 7700.

A. Manufacturer shall provide a minimum 20 year weathertightness warranty without dollar amount limitation.

1. Warranty coverage shall commence on completion of roofing installation, and shall terminate on the anniversary of the date of final inspection and approval by manufacturer's representative.After inspection and approval, warranty exclusions for improper design and installation will not be accepted. Design and installation exclusions listed in the manufacturer's standard warranty form shall be removed by one of the following methods:
   a. Deletion from the warranty form prior to preliminary submittal.
   b. Acknowledgement in the final inspection report that the design and installation complies with manufacturer's requirements, specifically referencing and nullifying each exclusion. A preliminary copy of this portion of the final inspection report shall be included with the warranty form submittal.

3. Wind Speed Coverage: 72 mph, measured at 10 meters above ground. Reference to "gale force winds" or similar language without a specific wind speed and elevation will not be accepted.

4. Warranty shall not exclude flashings, valleys, penetrations, or any other integral part of the roof system.

5. Warranty provisions requiring Owner to provide notice of leaks to manufacturer shall allow a minimum time period of 30 days for such notice.

6. For warranty repair work, provide full labor and materials required to restore roof system to weathertight condition without cost to the Owner.

B. Manufacturer shall provide a minimum 20 year non-prorated warranty for the paint finish under normal weather and atmospheric conditions against:

1. Crack, check, peel, flake, blister, or loss of adhesion of paint coating.

2. ASTM D4214; chalk of paint coating in excess of an 8 rating.

3. ASTM D2244; fade of paint coating in excess of 5 units of color.

4. For warranty repair work, provide full labor and materials required to restore roof system finish to original appearance without cost to the Owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Dimensional Metals, Inc.; IL20 series.

B. Holcim Building Envelope; Elevate UC-14.

C. MBCI; LokSeam.

2.02 MATERIALS:

A. Aluminum Sheet: ASTM B209.

B. Aluminum Extrusions: ASTM B221.

C. Sheet Steel: ASTM A792, with Class AZ-50 coating, Grade 40; structural quality.

2.03 COMPONENTS:

A. Metal Roof Panels: Prefinished 24 gauge sheet steel, standing seam profile with integral interlocking seams, smooth flat pan profile without stiffening ribs or striations; seam spacing 16 inches o.c.; finished seam height 1½ inch to 1¾ inch; continuous panel lengths without end laps.
   1. Panel seam spacing dimension may vary ±1 inch from specified dimensions to conform to manufacturer's standard configurations.

B. Flush Metal Soffit Panels: Prefinished 24 gauge sheet steel to match roof panels, flush seam profile; seam spacing nominal 12 inches o.c.

C. Flashings and Trim: Same material and finish as roof system; shapes and sizes as indicated and as required.

2.04 ACCESSORIES:

A. Concealed Fastening Clips: Two piece galvanized steel with expansion provisions, profile to correspond to panel profile; spaced maximum 18 inches o.c.

B. Fasteners: Stainless steel; manufacturer's standard concealed type for application. Exposed fasteners including pop rivets are not permitted except where specifically approved by Architect in areas not normally in the public view.

C. Felt Underlayment: ASTM D226, Type II; No. 30 asphalt saturated felt.

D. Membrane Underlayment: ASTM D1970; self-adhering rubberized asphalt; approved by roof panel manufacturer.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Metal roof panel manufacturer.
      b. Carlisle Residential; WIP 300HT.
      c. CertainTeed Corporation; Winter Guard HT.
      d. Owens-Corning Fiberglas Corporation; WeatherLock Specialty Tile & Metal.
   2. Fasteners: Plastic head ring shank nails.
   3. Primer: Water-based polymer modified type; approved by membrane underlayment manufacturer.

E. Slip Sheet: As recommended by roof system manufacturer. Do not use red rosin paper.

F. Sealant and Tape Mastic: Type as specified in Section 07 9200; approved by roof system manufacturer.

G. Cleaning Materials:

1. Metal Cleaner: Isopropyl alcohol or xylene.

2. Sealant Cleaner: Mineral spirits.

H. Snow Guards: Designed for mechanical attachment to vertical ribs without penetration of roof panels. Provide horizontal bars between ribs at indicated locations, at each building entrance located below metal roof eave, and elsewhere per manufacturer's design.

1. Manufacturers: In accordance with Section 01 6000.
   a. Contek, Inc.; Snow Management Systems.
   b. Metal Roof Innovations, Ltd.; S-5! series.
   c. Snobar; Colorbar series.

2. Materials: Manufacturer's standard components of the following types; metallurgically compatible with roof panels:
   a. Galvanized steel of finish and color to match roof panels.
   b. Cast aluminum.
   c. Stainless steel.
   d. Clear polycarbonate.

2.05 FABRICATION:

A. Conform to SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

B. Hem raw edges on all flashings.

2.06 FINISHES:

A. Primer: Manufacturer's standard type; 0.25 mil dry film thickness both sides.

B. Finish Coat: FGIA 621 or FGIA 2605; 70 percent PVDF fluoropolymer, minimum 0.70 mil dry film thickness; color as selected.

C. Strippable Coating: Factory applied to protect finish during fabrication, shipping and field handling.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Take field measurements to verify or supplement dimensions indicated prior to fabrication of panels.

B. Inspect roof supports and verify substrate is even, smooth, sound and free of depressions, waves or projections, and properly sloped.

C. Verify roof openings, pipes, sleeves, ducts, and vents through roof are solidly set.

D. Verify surfaces are dry and free of snow and ice.

3.02 INSTALLATION:

A. Conform to SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

B. Underlayment Installation:
   1. Install membrane underlayment to eaves, from roof edge to minimum 24 inches beyond interior face of exterior wall.
   2. Install membrane underlayment at valleys, extending minimum 4 feet each side of valley line.
   3. In areas where panel installation is delayed following installation of substrate, install membrane underlayment to field of roof.
   4. In other areas, install horizontal layers of felt underlayment parallel to eave.
   5. Membrane Underlayment: Weather lap ends and edges minimum 6 inches. Stagger end laps of each consecutive layer. Secure with fasteners in addition to self adhesive. Adhere minimum 3 inch diameter patch of membrane underlayment over each fastener head.
   6. Felt Underlayment: Shingle rows of felt from eave to ridge with minimum 6 inch overlap; stagger row ends.

C. Install slip sheet over underlayment prior to installing roof panels. Slip sheet may be omitted if recommended in writing by roof system manufacturer.

D. Install starter flashings and edge flashings before panels.

E. Install double male starter panel in center of each roof area.

F. Install panels plumb, level and straight with seams and ribs parallel.

G. Install panels weathertight, without waves, warps, buckles or distortions, and with allowance for expansion and contraction. Exercise care in handling panels and trim to prevent surface damage.

H. Do not install panels or trim in contact with dissimilar materials.

I. Apply sealant and tape mastic to flashing and panel joints where indicated and where required to prevent water penetration. Clean and prime materials with metal cleaner and sealant manufacturer's recommended primer prior to application of sealant and tape mastic.

J. Where exposed fasteners are approved by Architect, locate fasteners with uniform alignment and spacing.

K. Field interlock standing seam panels by snapping panels together. Snap-on seams are not permitted.

L. Metal Soffit Panels: Install in accordance with manufacturer's instructions, level, straight, and parallel; with tight joints, and with all required accessories.

M. Snow Guards: Install in accordance with manufacturer's layout and installation recommendations. Do not penetrate roof panels or vertical ribs.

N. Remove strippable coatings immediately after installation.

O. Coordinate installation of work projecting through roof with weather tight placement of flashings and counter flashings.

P. Coordinate grounding and bonding of metal roof panels with the work of Division 26 to comply with NFPA 70.

Q. Do not allow traffic on completed roof.

3.03 FIELD QUALITY CONTROL:

A. Inspection: Manufacturer's representative shall inspect installation minimum 3 times during progress of the work or biweekly, whichever is greater, and certify compliance with manufacturer's installation requirements.

B. Correct identified defects or irregularities.

3.04 CLEANING: In accordance with Section 01 7000.

A. Dispose of excess materials and debris from job site.

B. Clean sealant from finish surfaces with sealant cleaner.

C. Wash completed roof areas with commercial cleaner and soft bristle brush; flush with water. Leave panels clean and free from finger marks, grease and stains.

D. Clean and touch up minor scratches and fastener heads with manufacturer's recommended touch-up paint. Replace all other damaged material.

END OF SECTION

SECTION 07 7100 – ROOF SPECIALTIES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Coping caps.
   2. Gutters and down pipes.
   3. Down pipe adapters.
   4. Sheet metal flashings.

B. Related Requirements:
   1. Section 06 1050 – Miscellaneous Rough Carpentry.
   2. Section 07 5000 – Membrane Roofing.
   3. Section 07 6100 – Sheet Metal Roofing.
   4. Section 07 9200 – Joint Sealants.
   5. Section 09 9000 – Painting and Coating.
   6. Division 22 – Plumbing: Drainage piping.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

B. Design roof edge securement for low slope membrane roofs, except gutters, in accordance with SPRI ES-1, for wind speeds determined by the applicable building code.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Do not store materials with strippable film in areas exposed to direct sunlight.

B. Prevent contact with substances which may discolor prefinished surfaces.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Provide minimum 10 year manufacturer warranty for prefinished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading.

B. Coordinate with Section 07 5000 to ensure that roof edge securement is included in the roof membrane manufacturer warranty.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Galvanized Sheet Steel: ASTM A755, galvanized to G90 coating class.

B. Aluminum: ASTM B209.

2.02 COMPONENTS:

A. Coping Caps: SPRI ES-1; formed aluminum, 0.050 inch thick, or galvanized sheet steel, 24 gauge; maximum 10 ft lengths; shaped as indicated.

1. Manufacturers: In accordance with Section 01 6000.
   a. Roof membrane manufacturer.
   b. Architectural Products Co.
   c. Hickman Edge Systems, LLC.
   d. Metal-Era, Inc.
2. Anchor Plates: Galvanized sheet steel, 22 gauge, minimum 12 inch lengths; locate at 5 ft o.c. maximum.
3. Backing Plates: Material and profile to match coping, except without hems; minimum 6 inch lengths; locate at each joint.
4. Cleats: Galvanized sheet steel, 22 gauge, maximum 10 ft lengths, spliced at backing plates only; shaped to engage bottom hem of coping.
5. Fasteners: No. 8 screws with neoprene washers; hot dipped galvanized steel.
6. Accessories: Prefabricated soldered and mitered corners; end closures; attachment clips.
7. Finish: 70 percent PVDF fluoropolymer; color as selected.

B. Gutters and Down Pipes: Formed aluminum, 0.040 inch thick, or galvanized sheet steel, 24 gauge; minimum 10 ft lengths except at one end of run.

1. Provide gutter and down pipe sizes as indicated; where not indicated, calculate in accordance with SMACNA Architectural Sheet Metal Manual.
2. Gutters: Shaped as indicated.
3. Down Pipes: Smooth, non-corrugated profile.
4. Gutter Expansion Joints: Lap type; locate at maximum 50 ft o.c.
5. Gutter Outlets: 1/8 inch less than inside dimension of down pipe; minimum 4 inch length.
6. Brackets and Spacers: Minimum 3/16 x 1 inch.

7. Accessories: Prefabricated soldered and mitered corners; end closures; hangers; wire basket strainers.
8. Finish: 70 percent PVDF fluoropolymer; color as selected.

C. Down Pipe Adapters: Stainless steel, minimum 14 gauge thick; rectangular body, size to match down pipes; vertical dimension as detailed; stainless steel cleanout cover; Schedule 40 PVC outlet boot, size to match storm pipe.

1. Manufacturers: In accordance with Section 01 6000.
   a. Mifab, Inc.
   b. Piedmont Pipe Construction, Inc.
2. Fasteners: Stainless steel.
3. Finish: Powder coat paint, color as selected.

D. Flashing and Reglet: Formed aluminum, 0.050 inch thick, or galvanized sheet steel, 24 gauge; maximum 10 ft lengths; shaped as indicated.

1. Counterflashing and Hook Strips: Formed aluminum, 0.024 inch thick, or galvanized sheet steel, 24 gauge; maximum 10 ft lengths; shaped as indicated.
2. Accessories: Secure counterflashing with wedges and fill reglet with sealant in accordance with Section 07 9200.
3. Finish: 70 percent PVDF fluoropolymer; color as selected.

2.03 ACCESSORIES:

A. Fasteners: Concealed; hot dipped galvanized steel or stainless steel; size and type as required to penetrate substrate material minimum 1¼ inch; maximum 24 inch o.c. spacing.
   1. Nails: Roofing nails with annular threads and minimum 3/16 inch diameter heads.
   2. Bolts: Round head, ¼ inch minimum diameter.
   3. Rivets: 1/8 inch minimum diameter; compatible with materials being fastened.

B. Sealant: As specified in Section 07 9200.

C. Solder: 50% block tin and 50% lead.

D. Flux: Muriatic acid, diluted with equal parts of water.

E. Splash Blocks: Precast concrete.

2.04 FABRICATION:

A. Conform to SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

B. Hem exposed edges minimum ½ inch.

C. Make all flat and lap seams in direction of flow.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

C. Storm Piping: Flush with water and verify flow at downstream structure or outlet prior to connecting down pipes.

3.02 INSTALLATION:

A. Install components in accordance with manufacturer's instructions.

B. Conform to SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

C. Install components to provide for expansion and contraction of components and adjacent materials. Provide oversized or slotted holes with gasketed fasteners where necessary to accommodate thermal movement.

D. Coordinate installation of components with installation of roof membrane and base flashings.

E. Install gutters level and properly supported, located to collect rainwater and melting snow and ice runoff; lap joints in direction of flow, riveted and sealed watertight.

F. Install down pipes with mounting brackets spaced within 2 ft of each end, and at maximum 6 ft o.c. Mounting brackets may be omitted at lower end where connected to storm piping.
   1. Connect down pipes to site storm lines with fittings and adapters as required.
   2. Provide splash blocks for each down pipe outlet not connected to storm piping.

G. Coordinate installation of sealants and coatings with work of this section to ensure water tightness.

H. Touch up minor scratches and abrasions in finish work. Replace damaged components.

END OF SECTION

SECTION 07 7233 – ROOF HATCHES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Roof hatches.

B. Related Requirements:
   1. Section 05 5133 – Metal Ladders.
   2. Section 06 1050 – Miscellaneous Rough Carpentry: Blocking.
   3. Section 07 5000 – Membrane Roofing.
   4. Section 09 9000 – Painting and Coating.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate profiles, accessories, locations, adjacent construction interface, and dimensions.

1.03 WARRANTY: In accordance with Section 01 7700.

A. Provide minimum 4 year manufacturer warranty, covering defects in material and workmanship.

PART 2 PRODUCTS

2.01 ROOF HATCHES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Bilco Co.
   2. Milcor.
   3. Nystrom Building Products; Babcock-Davis.

B. Material: Aluminum; mill finish.

C. Scuttle Assembly: Completely assembled with heavy pintle hinges, compression spring operators enclosed in telescopic tubes, positive snap latch with turn handles and padlock hasps inside and outside.

D. Cover: Thermally broken type; 11 gauge; with 3 inch beaded flange and formed welded reinforcing members; gasketed seal; with automatic hold-open arm and vinyl grip release handle.
   1. Live Load: Minimum 40 lb/sq ft with maximum deflection 1/150 of span.
   2. Wind Uplift Load: 20 psf.
   3. Insulation: Polyisocyanurate, minimum 2 inch thickness; 18 gauge aluminum liner.

E. Curb: Thermally broken double wall type; 11 gauge; minimum 12 inch height, minimum 8 inches above high point of surrounding roof surface including crickets and tapered insulation; with 3½ inch flange with holes provided for securing to roof deck;

with integral metal cap flashing of same gauge and material as curb, full welded at corners for weathertightness.

1. Insulation: Polyisocyanurate, minimum 2 inch thickness.

F. Operators: Compression spring type, enclosed in telescopic tubes; arranged to provide smooth, easy and controlled door operation throughout the entire arc of opening and closing.

G. Hardware: Zinc plated and chromate sealed.

H. Safety Railing: Aluminum, galvanized steel, or reinforced fiberglass posts and rails, with self-closing gate; safety yellow color; corrosion resistant hardware; fabricated for attachment to curb without penetration of roofing membrane.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that the work of other trades is complete and properly installed. Coordinate installation with roof insulation and membrane installation.

B. Verify that roof openings are properly sized, with mounting surfaces straight and secure.

3.02 INSTALLATION:

A. Install Products for weathertight installation in accordance with manufacturer's instructions, securely fastened to roof deck.

B. Install safety railing to meet OSHA requirements.

END OF SECTION

SECTION 07 7600 – ROOF PAVERS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Concrete pavers.
   2. Adjustable pedestals.

B. Related Requirements:
   1. Section 07 2216 – Roof Insulation.
   2. Section 07 5000 – Membrane Roofing.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate pedestal and paver layout, relationship of components, and installation requirements.

B. Samples: Submit samples of each type of paver.

1.03 EXTRA MATERIALS: In accordance with Section 01 7700.

A. Provide 1 percent of extra paver materials to Owner; in new, unopened, packaging.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Minimum 3 years experience in installing paver tile work similar to that required for this project.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Provide 3 year Contractor warranty against defective material and workmanship.

B. Provide 10 year manufacturer warranty against defective paver and pedestal materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Hanover Architectural Products.

2.02 COMPONENTS:

A. Concrete Pavers:
   1. Size: Nominal 24 x 24 inch; 1½ inch thick; beveled edges.
   2. Color: Limestone Gray.
   3. Finish: Tudor.
   4. Sealer: Hanover Natural Sealer.

B. Pedestals: High density polyethyleine; threaded for adjustable height. (Hanover Elevator series)
   1. Leveling Pads: 7¾ inch diameter, ½ inch thick; sized for roof slope.
   2. Bases: 4 inch diameter; with buffer pad for membrane protection and load distribution.
   3. Couplers: Height extension with flange and eyelets.
   4. Caps: 4 inch diameter; with spacer tabs and cushion pads.
   5. Bracing: Connector bar sized to fit between bases; 18 gauge stainless steel wire.
   6. Shims: ABS plastic; 1/16 and 1/8 inch thick, for fine leveling of individual pavers.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify adequacy of supporting structure and compressive strength of insulation.

B. Verify roof membrane is installed, flashings are complete, and system has been inspected by membrane manufacturer's representative.

C. Verify surfaces to receive work are broom clean, properly sloped, and free of dirt, oil, frost, debris, projections, or foreign matter.

D. Verify perimeter restraints are complete and will prevent system movement in excess of 1/8 inch.

E. Verify elevations, dimensions, and required pedestal heights.

3.02 INSTALLATION:

A. Assemble and install pedestals in accordance with manufacturer's instructions. Adjust top of each pedestal to required elevation.

B. Provide bracing for pedestal heights of 16 inches and higher.

C. Place pavers in accordance with manufacturer's instructions; level, non-rocking, with uniform joints. Use pedestal inserts and shims to adjust and level finished surface as each row of pavers is installed.

D. Apply sealer to installed pavers.

END OF SECTION

SECTION 07 8400 – FIRESTOPPING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Firestop systems for penetrations through fire resistance rated assemblies.

B. Related Requirements:
   1. Division 21 – Fire Suppression.
   2. Division 22 – Plumbing.
   3. Division 23 – Heating, Ventilating, and Air Conditioning.
   4. Division 26 – Electrical.
   5. Division 27 – Communications.
   6. Division 28 – Electronic Safety and Security.

1.02 PERFORMANCE REQUIREMENTS:

A. Provide systems in accordance with UL Fire Resistance Directory that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire resistance rating of assembly penetrated.

B. F-Rated Systems: ASTM E814 or UL 1479; F-rating equal to or exceeding fire resistance rating of construction penetrated.

C. T-Rated Systems: ASTM E814 or UL 1479; provide for systems protecting penetrating items exposed to potential contact with adjacent materials in occupiable floor areas as follows:
   1. Penetrations located outside wall cavities.
   2. Penetrations located outside fire resistive shaft enclosures.
   3. Penetrations located in construction containing fire protection rated openings.
   4. Penetrating items larger than 4 inch diameter nominal pipe size or 16 square inch overall cross-sectional area.

D. For systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
   1. Piping Penetrations for Plumbing and Wet-Pipe Sprinkler Systems: Moisture resistant.
   2. Penetrations Involving Insulated Piping: Provide systems not requiring removal of insulation.
   3. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide systems capable of supporting floor loads involved either by installing floor plates or by other means.

E. For systems exposed to view, provide products with flame spread ratings of less than 25 and smoke developed ratings of less than 450, as determined per ASTM E84.

F. Compatibility: Provide systems compatible with each other, with substrates forming openings, and with penetrating items, under conditions of service and application.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Upon request, submit 3 copies in addition to the number required by Section 01 3300, or as required for distribution to governing authorities.

B. Shop Drawings: Where project conditions require modification of qualified testing agency's illustration to suit a particular condition, submit illustration, with modifications marked, approved by manufacturer's fire protection engineer.

C. Product Data: Documentation, including certified test reports and illustrations from qualified testing agency acceptable to authorities having jurisdiction, applicable to each system configuration for construction and penetrating items.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Trained and approved by manufacturer; specializing in installation of work similar to that required for this project.

1.05 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Prevent deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.06 ENVIRONMENTAL REQUIREMENTS:

A. Do not install systems when ambient or substrate temperatures are outside limits recommended by manufacturer, or when substrates are wet.

B. Ventilate systems per manufacturer's instructions, by natural or mechanical means as required.

1.07 COORDINATION:

A. Coordinate construction of openings and penetrating items to ensure that systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core drilled holes, or cut openings to accommodate systems.

C. Do not cover up system installations that will become concealed by subsequent construction until required inspections have been performed.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Intumescent Sealants: Single component latex formulations that after cure do not re-emulsify during exposure to moisture.

1. Manufacturers: In accordance with Section 01 6000.
   a. Hilti Construction Chemicals, Inc.; CP606.
   b. Johns Manville.
   c. Nelson Firestop Products.
   d. Pecora Corporation.
   e. Specified Technologies, Inc.; SpecSeal.
   f. 3M Fire Protection Products.

B. Packing Material: Mineral wool insulation, minimum 4 pcf density.

1. Manufacturers: In accordance with Section 01 6000.
   a. Hilti Construction Chemicals, Inc.
   b. Owens-Corning; Thermafiber Safing Insulation.
   c. Rock Wool Manufacturing Co.; Delta Safing Board.

C. Wall Head Insulation: Precut fiberglass or mineral wool plugs and strips to fill deck flutes.

1. Manufacturers: In accordance with Section 01 6000.
   a. Manufacturer of packing material, or in accordance with rated assembly.
   b. Hilti Construction Chemicals, Inc.; CP777 Speed Plugs.
   c. Rock Wool Manufacturing Co.; Linear and Trapezoidal Firestop.

2.02 ACCESSORIES:

A. Provide accessories as required to install materials and to comply with performance requirements. Use only components approved by manufacturer and qualified testing agency.

B. Permanent Forming, Damming and Backing Materials:
   1. Sealants used in combination with other materials to prevent leakage of fill materials in liquid state.
   2. Fire rated form board.
   3. Fillers for sealants.

C. Other Accessories: Temporary forming materials, substrate primers, retaining angles, support plates, collars and steel sleeves.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify substrate conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.

3.02 PREPARATION:

A. Surface Cleaning: Clean out openings immediately before installation.
   1. Remove from surfaces of opening substrates, and from penetrating items, foreign materials that could interfere with adhesion.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with system materials. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form release agents from concrete.

B. Priming: Prime substrates where recommended by manufacturer, using recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking: Use masking tape to prevent system materials from contacting adjoining surfaces that will remain exposed and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to removed smears from firestop system materials. Remove tape as soon as possible without disturbing seal of system to substrates.

3.03 INSTALLATION:

A. Install systems in accordance with performance requirements and manufacturer's instructions.

B. Install systems to comply with listed fire rated assemblies in accordance with ASTM and UL requirements.

C. Install forming, damming and backing materials and other accessories of types required to support fill materials during application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

D. Install fill materials for firestop systems by proven techniques to produce the following results:
   1. Fill voids and cavities as required to achieve fire ratings indicated.
   2. Apply materials to contact and adhere to substrates formed by openings and penetrating items.
   3. Finish fill materials that will remain exposed, to produce smooth, uniform surfaces flush with adjoining finishes.

3.04 IDENTIFICATION:

A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive vinyl labels. Attach labels permanently to both sides of penetrated construction where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
   1. Preprinted Copy: "Warning – Through-Penetration Firestop System – Do Not Disturb. Notify Building Management if Damaged.
   2. Contractor's name, address and phone number.
   3. Testing agency's system designation.
   4. Manufacturer's name.
   5. Installer's name and date of installation.

3.05 CLEANING AND PROTECTION:

A. Clean excess fill materials adjacent to openings as work progresses using methods and cleaning materials approved by manufacturer and that do not damage materials in which openings occur.

B. Protect installed products from damage during construction operations until final completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated materials and install new materials to produce systems complying with specified requirements.

3.06 SCHEDULES:

A. For each location where a fire rated assembly is penetrated, provide a UL listed through-penetration firestop system as scheduled below or as appropriate for project conditions, complying with specified requirements and suitable for penetration conditions indicated.

B. Metallic Pipe, Conduit or Tubing:
   1. Masonry Walls (Single Penetration): UL C-AJ-1226, C-AJ-1259, C-AJ-1281, or C-AJ-5091.
   2. Masonry Walls (Multiple Penetrations): UL C-AJ-1284.
   3. Concrete Floor on Metal Deck: UL F-A-1012.
   4. Stud Walls (Single Penetration): UL W-L-1149, W-L-1344, or W-L-5029.
   5. Stud Walls (Multiple Penetration): UL W-L-1249.

C. Nonmetallic Pipe, Conduit or Tubing:
   1. Masonry Walls: UL C-AJ-2223.
   2. Concrete Floor on Metal Deck: UL F-A-2036 or F-A-2213.
   3. Stud Walls (Through Penetrations): UL W-L-2078 or W-L-2169.
   4. Stud Walls (Tee Penetrations Connected to Vertical Piping): UL W-L-2179.

D. Insulated Pipes: Refer to Section 22 0700 and Section 23 0700 for insulation requirements.
   1. Masonry Walls: UL C-AJ-5123.

2. Stud Walls: UL W-L-5088.

E. HVAC Ducts:
1. Masonry Walls (Round Ducts): C-AJ-7040.
2. Masonry Walls (Rectangular Ducts): UL C-AJ-7041.
3. Stud Walls (Round Ducts): UL W-L-7031.
4. Stud Walls (Rectangular Ducts): UL W-L-7030.
5. Penetrations Through Non-Rated Floor-Ceiling Assemblies: Mineral wool safing insulation or other approved noncombustible material.

F. Electrical Cables Not in Conduit:
1. Masonry Walls: UL C-AJ-3140.
2. Concrete Floor on Metal Deck: UL F-A-3003.
3. Stud Walls: UL W-L-3121 or W-L-3210.

G. Wall Head Joints: UL 2079.
1. Metal Stud Wall Head at Metal Floor or Roof Deck: UL HW-D-0047.
2. Masonry Wall Head at Metal Floor or Roof Deck: UL HW-D-0064.

H. Openings Without Penetrating Items:
1. Without Support Plates: UL C-AJ-0062.
2. With Support Plates: UL C-AJ-0063.

END OF SECTION

SECTION 07 9200 – JOINT SEALANTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Sealing of interior and exterior joints.
   2. Sealing of glazing joints.

B. Related Requirements:
   1. Caulking and sealant work performed under other Sections shall be performed in accordance with the provisions of this Section.
   2. Section 03 3000 – Cast-in-Place Concrete: Joint fillers and sealants for floors, sidewalks and pavements.
   3. Section 07 2100 – Thermal Insulation: Insulating foam sealants.
   4. Section 08 8000 – Glazing.
   5. Section 09 3013 – Ceramic Tiling: Sealant for tile grout.
   6. Section 09 8100 – Acoustic Insulation: Acoustical sealants.
   7. Division 22 – Plumbing: Caulking around plumbing fixtures.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Provide manufacturer's standard details and installation instructions; identify substrates requiring primers, type of primer recommended by manufacturer, and surface preparation required.

B. Samples: Submit full range of colors for selection.

1.03 QUALITY ASSURANCE:

A. Installer Qualifications: Firm regularly engaged in installation of sealers of the type specified for not less than 5 years; all work performed by workers thoroughly skilled and specially trained in the techniques required.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials between 40 and 90 degrees F, and under conditions and for a period of time not longer than that recommended by manufacturer.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Install sealants when air and substrate temperatures are over 40 degrees F and rising, but less than 100 degrees F, unless specific installation instructions are obtained from manufacturer.

1.06 WARRANTY: In accordance with Section 01 7700.

A. Exterior Joints: Correct defective Work within a 5 year period after Date of Substantial Completion for damage resulting from adhesive or cohesive failure, and failure to prevent infiltration of water or air through the sealed joint.

PART 2 PRODUCTS

2.01 JOINT SEALERS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Tremco, Inc.
   2. Dow Chemical Co.
   3. Master Builders Solutions.
   4. Momentive Performance Materials, Inc.
   5. Pecora Corporation.
   6. Schnee-Morehead, Inc.
   7. Sherwin-Williams Co.
   8. Sika Corporation.

B. Polyurethane Sealants: ASTM C920.
   1. One-Part Polyurethane: Type S, Grade NS, Class 100/50, Use NT, T, M, A, O, and I; paintable. (Sikaflex 15 LM)
   2. One-Part Modified Polyurethane: Type S, Grade NS, Class 35, Use NT, M, A, and O; paintable. (Tremco Dymonic FC; Sikaflex 1A; MasterSeal NP1)
   3. Multi-Component Polyurethane: Type M, Grade NS, Class 50, Use T, I, M, A, and O. (Tremco Dymeric 240FC; Sikaflex 2c NS)

C. Silicone Sealants: ASTM C920.
   1. Exterior Type: Type S, Grade NS, Class 100/50, Use NT, M, G, A, and O. (Tremco Spectrem 1; Dowsil 790)
   2. Sanitary Type: Type S, Grade NS, Class 25. (Momentive GE SCS1700 series; Dowsil 786; Tremco Tremsil 200)
   3. Glazing Type: Type S, Grade NS, Class 25, Use NT, G, A, and O. (Tremco Proglaze; Tremco Tremsil 600; Dowsil 795)

D. Acrylic Latex Caulk: ASTM C834; paintable. (Tremco Tremflex 834; Sherwin-Williams Magnum XL; Pecora AC-20)

E. Butyl Caulk: ASTM C1311; non-skinning isobutylene-isoprene copolymer. (SikaLastomer 511; Tremco Butyl Sealant)
   1. Tape Mastic: FGIA 800; isobutylene-isoprene copolymer tape. (SikaLastomer 65; Schnee-Morehead SM5227)

F. Colors: As selected.
   1. Vertical Joints in Masonry: Match masonry unit color, or slightly darker.
   2. Horizontal Joints in Masonry: Match mortar color.
   3. Joints Around Windows, Doors and Other Openings: Match color of frame material.

4. Other Locations: As selected from manufacturer's standard colors.

2.02 ACCESSORIES:

A. Primers: As recommended by sealant and glazing system manufacturers. Provide primers where indicated, where recommended by manufacturer, and also where preconstruction tests indicate the need for primers to obtain optimum adhesion.

B. Backer Rod: ASTM C1330; round, flexible, closed cell polyethylene, or as recommended by sealant manufacturer; chemically inert, solvent resistant.
   1. Size: Diameter 15% greater than joint width, continuous lengths.

C. Glazing Tape: As specified in Section 08 8000.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that dimensions are correct and substrate is in proper condition for installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Do not begin installation until substrates are clean, dry, and free of loose aggregate, laitance, paint, corrosion, oil, grease, tar, asphalt, mastic compounds, wax, waterproofing agents, release agents, and other deleterious substances.

3.02 PREPARATION:

A. Preconstruction Field Adhesion Testing: ASTM C1193.
   1. Conduct field tests for adhesion of joint sealants to actual substrates using proposed joint preparation methods, for each type of sealant and substrate, prior to general installation.
   2. Use manufacturer's standard field adhesion test methods and joint preparation methods to verify proper priming and preparation techniques required to obtain optimum adhesion of sealants to substrate.
   3. Repeat testing until satisfactory adhesion is achieved. Evaluate and report results.
   4. Approved results shall become the standard of acceptability for the project.

B. Remove foreign substances from substrate. Clean substrate in accordance with manufacturer's instructions and the following general methods:
   1. Porous Surfaces:
      a. Remove laitance by acid washing, grinding or mechanical abrading.
      b. Remove form oils by sandblasting.
      c. Vacuum or blow out joints with oil-free compressed air to remove loose particles.

2. Non-Porous Surfaces:
   a. Remove protective coatings using solvent recommended by sealant manufacturer.
   b. If surface has been treated or coated with a special coating, contact sealant manufacturer for recommendations.

C. Mask adjacent finished surfaces and adjacent porous surfaces that would be damaged by primer, sealant, or cleaning agents.

D. Prime surfaces to receive sealant in accordance with manufacturer's instructions, and allow to dry before installing sealant. Do not apply primer to surfaces outside of joint. Prime surfaces prior to installing backer rod or bond-breaker tape.

E. Install joint backing. Do not puncture, twist, compress less than 25 percent or more than 50 percent, or stretch backer during installation.

1. Install joint backing to control joint depth as indicated and to prevent 3-sided bond.

2. Install to control depth at midpoint of sealant as follows, unless otherwise indicated. Do not exceed sealant manufacturer's recommended maximum width.
   a. Joint Width ¼ to ½ Inch: Depth equal to width.
   b. Joint Width Greater Than ½ Inch: ½ inch depth.

3.03 APPLICATION:

A. Install sealants in accordance with manufacturer's instructions and ASTM C1193.

B. Gun Grade Sealants: Extrude sealant to completely fill joint using proper gun and nozzle. Tool to compress sealant against sides of joint and eliminate air bubbles. Leave a neat, slightly recessed concave surface, unless otherwise indicated.

C. Self Leveling Sealants: Pour sealant to fill joint, slightly recessed below adjacent surfaces.

D. Curing:
1. Cure sealants in compliance with manufacturer's instructions to obtain high early bond strength, internal cohesive strength, and surface durability.
2. Where joints are scheduled to be painted, allow sealant to cure before painting over joint.
3. Advise the Contractor of procedures required for curing and protection during the construction period, to prevent deterioration or damage (other than normal wear and weathering) at Substantial Completion.

3.04 CLEANING:

A. Clean primer and sealant from adjacent surfaces. Wipe fresh sealant immediately from adjacent surfaces. Do not use cleaning agents which may damage finishes.

B. Remove masking tape from completed joints.

3.05 SCHEDULE:

A. General Purpose Interior and Exterior Applications: Multi-component polyurethane.
   1. Joints and recesses between adjacent construction and frames, sills, and subsills of windows, doors, curtain wall, storefront, and similar items.
   2. Around both exterior and interior surfaces of penetrations in exterior walls.
   3. Under door thresholds, and at bottom of door frames.
   4. Wherever necessary to prevent infiltration of water or air into or through exterior building enclosure.

B. Expansion and Control Joints: Silicone sealant, exterior type.
   1. Joints in cast stone.
   2. Joints in concrete masonry.
      a. At locations scheduled for paint, use one-part polyurethane.

C. Concealed Exterior Locations: Butyl caulk and tape mastic.
   1. Metal to metal joints within sheet metal roofing and flashing assemblies.

D. Other Exterior Applications: One-part modified polyurethane.
   1. Between adjacent construction and copings, fascias, and flashings.
   2. Metal flashing inserted into reglet.
   3. Top edge of surface mounted counterflashing.
   4. Exposed locations at metal roofing.
   5. Joints in fiber-cement siding.

E. Interior Wet Areas: Silicone sealant, sanitary type.
   1. Between adjacent construction and plumbing fixtures, counter tops, plumbing cut-outs, window stools, and similar applications subject to contact with water.

F. Other Interior Applications: Acrylic latex caulk.
   1. Small voids between walls or partitions and adjacent casework, door frames, built-in or surface-mounted equipment and fixtures, and similar items.
   2. Joints of interior walls and partitions which adjoin columns.
   3. Interior locations not otherwise indicated or specified, where small voids exist between materials specified to be painted.
   4. Tile joints between nonplanar tile surfaces, between tile floors and tile cove base, between tile and dissimilar materials, and joints occurring where substrates change.
   5. Other exposed and concealed locations within partitions to seal against passage of air.

G. Glazing:
   1. Sealer: Silicone sealant, glazing type.
   2. Tape: Glazing tape.
   3. Applications: As scheduled in Section 08 8000.

END OF SECTION

SECTION 08 1213 – HOLLOW METAL FRAMES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Steel door frames.
   1. Non-rated.
   2. Fire rated.

B. Related Requirements:
   1. Section 07 9200 – Joint Sealants.
   2. Section 08 1400 – Wood Doors.
   3. Section 08 7100 – Door Hardware.
   4. Section 08 8000 – Glazing.
   5. Section 09 9000 – Painting and Coating.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate elevations, internal reinforcement, closure method, anchor types and spacings, finishes, and cut-outs for hardware and glazing.

1.03 QUALITY ASSURANCE:

A. Conform to requirements of ANSI A250.8 and ADA.

B. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum three years documented experience.

1.04 REGULATORY REQUIREMENTS:

A. Fire Rated Door and Frame Construction: Conform to UL 10C and applicable building code.

B. Installed Door and Frame Assembly: Conform to NFPA 80 for fire rated class as indicated.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, protect, and handle products to site under provisions of Section 01 6000 and HMMA 840.

B. Accept Products on site in manufacturer's packaging. Inspect for damage.

C. Break seal on site to permit ventilation.

D. Provide ¼ inch spaces between stored materials to promote air circulation.

1.06 PROJECT CONDITIONS: In accordance with Section 01 3100.

A. Coordinate frame installation with size, location, and installation of service utilities.

B. Coordinate the work with door opening construction and hardware installation.

C. Sequence installation to ensure wiring connections for electric hardware components are achieved in an orderly and expeditious manner.

PART 2 PRODUCTS

2.01 FRAMES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Ceco Door Products.
   2. Curries Company.
   3. Core Industries, Inc.; Pioneer Industries Division.
   4. Republic Doors and Frames.
   5. Steelcraft Manufacturing Company.

B. Interior Frames: 16 gauge thick cold rolled steel.

2.02 ACCESSORIES:

A. Glass: In accordance with Section 08 8000.

B. Anchorages: Galvanized steel, minimum 18 gauge.

C. Fasteners: Concealed type where possible. Where exposed screws and bolts are required, provide only countersunk, flat Phillips head fasteners.

D. Removable Stops: Rolled steel, channel shape, mitered corners; prepared for countersunk style screws. Locate removable stops on secure side of frame.

E. Primer: Rust inhibitive, suitable to receive finish coatings specified.

F. Silencers: Resilient rubber or vinyl, fitted into drilled hole.

2.03 FABRICATION:

A. Fabricate frames as welded unit, mitered and ground smooth.
   1. Knock down slip on type frames may be used at non-rated interior openings maximum 36 inches wide in gypsum board construction, at Contractor's option.

B. Fabricate doors and frames for hardware installation in accordance with approved hardware shop drawings and ANSI A115. Provide hardware reinforcement plates welded in place. Provide mortar guard boxes and dust covers. When not otherwise scheduled, provide reinforcement for the following hardware:
   1. Hinges: 4½ x 4½ inch, full mortise, template type.
      a. Doors Without Closers: Regular weight.
      b. Doors With Closers: Extra heavy weight.
      c. Doors up to 88 Inches High: 1½ pair.
   2. Lockset: Mortise type, 2¾ inch backset.

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 silencers for single doors. Provide two single silencers on frame head at double doors without mullions.

E. Permanently affix fire rating identification label of approved testing agency to each fire rated assembly.

F. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.

G. Sill Bars for Glazed Lights: Fixed type, flush with both faces of adjacent jambs; profile coordinated with jamb.

2.04 FINISH:

A. Cold Rolled Steel Sheet: ASTM A1008, matte finish exposed, oiled.

B. Primer: Clean by degreasing process; phosphatize; apply one coat primer, baked on, capable of passing a 70 hour salt spray test in accordance with ASTM B117. Prime all surfaces, including under and inside removable stops.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

3.02 INSTALLATION:

A. Install frames in accordance with ANSI A250.8, HMMA 840, and DHI.

B. Coordinate with wall construction for anchor placement. Install frames in stud walls with 8 anchors.

C. Brace frames placed prior to constructing walls; maintain plumb and planar. Remove braces after anchorages are permanently installed.

D. Coordinate installation of glass and glazing.

E. Coordinate installation of door hardware.

F. Touch-up abrasions with primer. Touch-up minor rust areas; sand smooth; apply primer.

3.03 ERECTION TOLERANCES:

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

END OF SECTION

SECTION 08 1400 – WOOD DOORS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Wood doors; flush design.
   1. Non-rated.
   2. Fire rated.

B. Related Requirements:
   1. Section 08 1213 – Hollow Metal Frames.
   2. Section 08 7100 – Door Hardware.
   3. Section 08 8000 – Glazing.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining and finishing, and cut-outs and trim for hardware and glazing.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

1.03 QUALITY ASSURANCE:

A. Perform work in accordance with WDMA IS-1A, Custom grade; Extra Heavy Duty performance duty level.

B. Finish doors in accordance with AWI 0400 and WDMA.

C. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum three years documented experience.

1.04 REGULATORY REQUIREMENTS:

A. Fire Rated Door and Panel Construction: Conform to UL 10C, NFPA 252 and applicable building code.

B. Installed Door and Frame Assembly: Conform to NFPA 80 for fire rated class as indicated.

1.05 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Accept Products on site in manufacturer's packaging. Inspect for damage.

B. Do not store in damp or wet areas, areas with uncured concrete, or in areas exposed to direct sunlight. Seal top and bottom edges if stored more than one week. Break packaging seal on site to permit ventilation.

C. Store flat on a level surface, minimum 3½ inches off the floor. Provide ¼ inch spaces between stacked doors to promote air circulation.

D. Maintain relative humidity in storage area, and in building following installation, between 30% and 50%. Maintain temperature between 50 degrees F and 90 degrees F.

E. Handle with clean hands or gloves; do not drag doors across one another or across other surfaces.

1.06 PROJECT CONDITIONS: In accordance with Section 01 3100.

A. Coordinate the work with door opening construction, door frame and hardware installation.

PART 2 PRODUCTS

2.01 FLUSH WOOD INTERIOR DOORS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Forte Opening Solutions.
   2. Oshkosh Door Co.
   3. VT Industries, Inc.

B. Construction: 1¾ inches thick; 5-ply hot pressed, fire rated where indicated.
   1. Solid Core, Non-Rated: WDMA SLC-5 or SCLC-5; stave lumber core or structural composite lumber core.
   2. Solid Core, Fire Rated: WDMA FD-5; mineral core; neutral pressure, with fire rating as indicated.

C. Veneer Facing for Paint Finish: Medium density overlay over standard thickness hardwood face veneers.

2.02 ACCESSORIES:

A. Glass: In accordance with Section 08 8000.

B. Glazing Stops: Wood, of same species as door facing with metal clips for rated doors; recessed or flush molding, beveled profile with mitered corners; prepared for countersunk style screws.

2.03 FABRICATION:

A. Fabricate doors in accordance with AWI Architectural Woodwork Standards and WDMA requirements.
   1. Fabricate fire rated doors in accordance with UL requirements. Attach fire rating label to door.

B. Vertical Exposed Door Edge: Hardwood for type of finish to match door. Bond edge banding to cores.

C. Factory machine doors for finish hardware in accordance with approved hardware shop drawings and ANSI A115. Provide blocking for lockset, closer, and other finish hardware items scheduled. Do not machine for surface hardware. When not otherwise scheduled, provide for the following hardware:

1. Hinges: 4½ x 4½ inch, full mortise, template type.
   a. Doors Without Closers: Regular weight.
   b. Doors With Closers: Extra heavy weight.
   c. Doors up to 88 Inches High: 1½ pair.
2. Lockset: Mortise type, 2¾ inch backset.

D. Factory fit doors for frame opening dimensions identified on shop drawings.

E. Provide edge clearances in accordance with AWI 0641.

F. Factory prime doors.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that 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.

3.02 INSTALLATION:

A. Install doors in accordance with AWI Architectural Woodwork Standards and WDMA requirements.
   1. Install fire rated doors in accordance with NFPA 80.

B. Trim non-rated door width by cutting equally on both jamb edges.

C. Trim door height by cutting bottom edge only a maximum of ¾ inch, and in accordance with fire rating requirements. Allow for installation of finish flooring materials as scheduled.

D. Coordinate installation of doors with installation of frames and hardware.

E. Prior to installation, finish bottom edge of doors scheduled to be field finished.

F. Coordinate installation of glass and glazing. Site finish glazing stops to match door facing.

G. Site finish doors as specified in Section 09 9000.

3.03 INSTALLATION TOLERANCES:

A. Maximum Diagonal Distortion (Warp): 1/8 inch measured with straight edge or taut string, corner to corner, over an imaginary 36 x 84 inch surface area.

B. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over an imaginary 36 x 84 inch surface area.

C. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 x 84 inch surface area.

3.04 ADJUSTING: In accordance with Section 01 7000.

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 08 3613 – SECTIONAL DOORS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Sectional overhead doors and accessories.

B. Related Requirements:
   1. Section 05 5000 – Metal Fabrications: Steel jambs.
   2. Section 09 9000 – Painting and Coating: Field painting.
   3. Division 26 – Electrical: Power wiring to electric door operators.

1.02 SYSTEM DESCRIPTION:

A. Provide each sectional overhead door, hardware, and accessories as a complete unit produced by one manufacturer to suit openings and available head room.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate special components and installations which are not fully dimensioned or detailed in manufacturer's data.

B. Product Data: Indicate roughing-in diagrams and installation instructions. Include manufacturer's operating instructions and maintenance data. Indicate summary of forces and loads on walls and jambs.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section, with minimum three years documented experience; authorized by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Overhead Door Corporation.

B. Clopay Building Products Co.

C. Crawford Door Products, Inc.

D. Haas Door Co.

E. Northwest Door.

F. Porvene McKee, Inc.

G. Raynor Garage Doors.

H. Wayne-Dalton Corporation.

2.02 MATERIALS:

A. Steel Sheet: ASTM A653, commercial quality, with G90 galvanized coating; chemically treated for paint adherence.
   1. Yield Strength: 33,000 psi.

2.03 SECTIONAL OVERHEAD DOORS:

A. Door Construction: Insulated metal sandwich panels with thermal break and shiplap joints. (Overhead Door 595 series)
   1. Performance Requirements:
      a. Air Infiltration: FGIA 101; maximum 0.20 cfm/sq ft, at 1.57 psf static air pressure differential.
      b. Thermal Transmittance: FGIA 1503; maximum U-value 0.22 Btu/sq. ft.
      c. Wind Load Design Criteria: In accordance with applicable building code; minimum 25 psf.
   2. Panel Thickness: 1-5/8 inch to 2 inch.
   3. Exterior Face: Galvanized steel, minimum 20 gauge; flush, smooth surface.
   4. Interior Face: Galvanized steel, minimum 26 gauge; flush surface with stiffening ribs.
   5. Insulation: Fully encapsulated polyurethane.

B. Intermediate and end stiles shall be minimum 18 gauge steel, formed and welded as integral structures with the rolled-section panels. Space intermediate stiles at maximum 48 inches o.c.

C. Reinforce sections with continuous horizontal and diagonal reinforcement, as required to stiffen door and for wind loading, and for hardware attachment. Provide galvanized steel bars, struts, trusses or strip steel, formed to depth or welded in place.
   1. Provide additional reinforcement where necessary to maintain weather seal and prevent thermal bow at temperature differential up to 80 degrees F.

D. Fabricate sections so finished door assembly is rigid and aligned, with tight hairline joints, and free of warp, twist and deformation.

E. Finish: Factory applied baked-on polyester coating; color as selected.
   1. If factory finishes are available in less than 5 colors, Architect reserves the right to require field painting of door exterior in accordance with Section 09 9000.

2.04 TRACKS, SUPPORTS AND ACCESSORIES:

A. Tracks: Manufacturer's standard galvanized steel track system, sized for door size and weight, designed for high-lift operation and maximum lift clearance for the structural conditions, with adequate clearance for hardware and accessories.

B. Support and attach tracks to opening jambs with continuous angle welded to tracks and attached to wall. Support horizontal tracks with continuous angle welded to track and supported by laterally braced attachments to overhead structural members at curve and end of tracks; with leaf type bumper to prevent over travel of door.

C. Supports: Galvanized steel track reinforcement and support members.

D. Weather Seals: Replaceable, adjustable, continuous, compressible gaskets.
   1. Bottom Weather Seal: Flexible PVC, held in place by a retainer.
   2. Jamb Weather Seal: Full length, flexible PVC bulb seal affixed to jamb, held in place by the jamb seal retainer.

2.05 HARDWARE:

A. General: Provide heavy-duty, corrosion-resistant hardware with galvanized or cadmium-plated or stainless steel fasteners to suit door type.

B. Hinges: Provide heavy-duty galvanized steel hinges at each end stile and at each intermediate stile per manufacturer's recommendations for size of door. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is not possible.

C. Rollers: Provide heavy-duty rollers with steel ball bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Provide roller tires to match track size.

2.06 COUNTERBALANCING MECHANISM:

A. Counterbalancing Torsion Spring: Hang door assembly for operation by torsion bar counterbalance mechanism consisting of adjustable tension tempered, 25,000 cycle heavy duty steel torsion springs mounted on a case-hardened steel shaft, and connected to door with galvanized steel utility cable with cable safety factor of minimum 5 to 1.

B. Cable Drums: Cast aluminum or gray iron, grooved to receive cable.

C. Mount counterbalance mechanism with manufacturer's standard ball bearing brackets at each end of shaft and at midpoint of shaft, unless closer spacing is recommended by manufacturer.

D. Cable Safety Device: Spring loaded steel or bronze cam mounted to bottom door roller assembly on each side, designed to automatically stop door if either cable breaks.

2.07 ELECTRIC DOOR OPERATORS:

A. Door Operators: Heavy duty commercial type. (Overhead Door Corp., Model L)

B. Motor: UL listed, 1/3 hp, 208V three phase, totally enclosed, instant reversing with automatic reset thermal overload. Reversing contactor shall be heavy duty, electrically and mechanically interlocked. Limit switches shall be adjustable rotary type synchronized with door.

C. Reduction Gearing: Primary reduction with worm gear in oil; secondary reduction with chain and sprockets. Provide ball bearing type power train with adjustable disc type clutch and solenoid actuated drum type brake.

D. Mounting: Center mounted jackshaft type with chain hoist or trolley type with drawbar, as required by headroom, clearances, and project conditions.

E. Safety Switch: Electric contact strip full width of bottom section, to automatically reverse door direction when obstruction is encountered.

F. Interior Controls: Surface mounted 24 volt control station in NEMA type 4 enclosure; three-button OPEN/CLOSE/STOP controls with key operated ON/OFF switch. (Overhead Door #76782)
   1. Deliver 4 keys to Owner at Substantial Completion.

G. Wireless Remote Controls: One receiver and one transmitter.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Examine wall and overhead areas, including opening framing, for compliance with requirements for installation tolerances, clearances, and other conditions affecting the work of this Section.

B. Verify exposed steel frames are painted prior to door installation.

3.02 INSTALLATION:

A. Install door, track, and operating equipment complete with necessary hardware, jamb and head mold stops, anchors, inserts, hangers, and equipment supports in accordance with shop drawings and manufacturer's instructions.

B. Fasten vertical track assembly to framing at maximum 24 inches o.c. Hang horizontal track from structural overhead framing with angle or channel hangers, welded and bolted in place. Provide sway bracing, diagonal bracing, and reinforcing as required for rigid installation of track and door operating equipment.

3.03 ADJUSTING:

A. Adjust clearance between track and door, and end play in rollers, to conform to manufacturer's recommendations.

B. Lubricate bearings and sliding parts, adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

END OF SECTION

SECTION 08 4113 – ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Aluminum entrance and storefront framing.
   2. Aluminum doors and frames.
   3. Door hardware.

B. Related Requirements:
   1. Section 07 2100 – Thermal Insulation.
   2. Section 07 9200 – Joint Sealants.
   3. Section 08 7100 – Door Hardware.
   4. Section 08 8000 – Glazing.

1.02 DESIGN REQUIREMENTS:

A. Aluminum entrance and storefront system includes tubular aluminum sections with supplementary internal support framing, shop fabricated, factory finished, with related flashings, accessories, anchorage and attachment devices.

B. 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, calculated in accordance with applicable building code.

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 and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

E. Thermal Movement: Provide for expansion and contraction within system components caused by a cycling temperature range of 170 degrees F without causing detrimental effect to system components, sealants, and anchorage.

F. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.03 PERFORMANCE REQUIREMENTS:

A. Air Infiltration: ASTM E283; maximum 0.06 cfm/ft, at 6.24 psf static air pressure differential.

B. Water Leakage: ASTM E331; none, at 8.0 psf static air pressure differential.

C. Deflection: In accordance with FGIA TIR-A11.

D. Thermal Transmittance: FGIA 1503; maximum assembly U-value 0.45 Btu/sq. ft. with specified glazing.

E. Condensation Resistance: FGIA 1503; minimum CRF 45.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate dimensions, framed opening requirements and tolerances, project-specific interface details with adjacent construction including flashing materials, anchorage, insulation, and expansion and contraction joint locations and details.

B. Product Data: Provide component dimensions, installation instructions, description of components within assembly, anchorage and fasteners, door hardware, internal drainage details, and accessories.

C. Design Data: Provide framing member structural and physical characteristics, calculations, and dimensional limitations.

1.05 QUALITY ASSURANCE:

A. Perform Work in accordance with FGIA CWM-1 and FGIA SFM-1.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum three years documented experience.

C. Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in the design of this Work and licensed at the place where the Project is located.

1.06 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Handle Products of this section in accordance with FGIA CW-10.

B. 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.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. Do not install sealants when ambient temperature is less than 40 degrees F during and 48 hours after installation.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Extruded Aluminum: ASTM B221, alloy G.S. 10A-T5.

B. Sheet Aluminum: ASTM B209.

C. Sheet Steel: ASTM A653, galvanized in accordance with ASTM A123.

D. Steel Sections: ASTM A36; shaped to suit mullion sections.

E. Fasteners: Aluminum or stainless steel.

F. Glass and Glazing Materials: As specified in Section 08 8000 of types described below:
   1. Glass in Exterior Doors and Lights: 1 inch thick Low E insulating glass units.
   2. Glass in Interior Doors and Lights: ¼ inch thick.

G. Sealant and Backing Materials: As specified in Section 07 9200.

2.02 COMPONENTS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Capitol Aluminum and Glass Corp.
   2. Efco, LLC.
   3. Oldcastle BuildingEnvelope.
   4. Tubelite, Inc.

B. Interior Framing Members: 1¾ x 4½ inch nominal dimension; center plane glazing; flush glazing stops; drainage holes; internal weep drainage system. (Capitol 145; Tubelite 4500; Oldcastle FG-2000)

C. Exterior Thermal Break Framing Members: 2 x 4½ inch nominal dimension; thermally broken with interior tubular section insulated from exterior; center plane glazing; flush glazing stops; drainage holes; internal weep drainage system. (Capitol 245T; Oldcastle 3000 Thermal; Tubelite T14000)

D. Reinforced Framing Members: Nominal dimension to match adjacent framing; profile of extruded aluminum with internal reinforcement of shaped steel structural section.

E. Curtain Wall Framing Members: 2½ x 7½ inch nominal dimension; thermally broken with interior tubular section insulated from exterior; flush glazing stops; drainage holes; internal weep drainage system. (Capitol 2500 Wall; Tubelite 400 Series)

F. Doors: 1¾ inches thick; 4½ inch to 5½ inch top rail and vertical stiles, 10 inch bottom rail.

G. Framing Accessories: Fillers, corner posts, receptors, expansion mullions; to coordinate with framing members; as indicated.

H. Flashings: 0.050 inch thick aluminum, finish to match mullion sections where exposed.

2.03 DOOR HARDWARE:

A. Manufacturers: As listed in Section 08 7100.

B. General Requirements: Entrance system manufacturer's standard type to suit application; factory installed where applicable. Refer to Section 08 7100 for additional hardware.

C. Provide the following hardware for all doors:
   1. Weatherstripping: Thermoplastic elastomer with semi-rigid polymeric backing.
   2. Astragal at Meeting Stiles: Adjustable type with stainless steel backing, with weatherstripping.
   3. Hinges: Continuous geared hinge, surface applied to door and frame.

D. Provide the following hardware at locations scheduled in Section 08 7100:
   1. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; mill finish.
   2. Sill Sweep Strip: Resilient EPDM blade gasket in aluminum extrusion, applied to interior exposed surface of bottom rail with concealed fasteners.
   3. Closer: Surface mounted, parallel arm; with back-check. (LCN P4041)
   4. Closer With Stop: Surface mounted, parallel arm; with back-check. (LCN P4041-3077CNS)

2.04 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. Secure door corners with mechanical clips, sigma deep penetration welds and sigma fillet welds.

D. Prepare components to receive anchor devices. Fabricate anchors.

E. Arrange fasteners and attachments to conceal from view.

F. Prepare components with internal reinforcement for door hardware.

G. Reinforce framing members for imposed loads and to receive threaded fasteners.

H. Provide for isolation of incompatible metals to prevent galvanic deterioration.

2.05 FINISH:

A. Exposed Aluminum Surfaces: Color anodized; FGIA 611, Class I; dark bronze color; AA M12C22A44.

B. Concealed Steel Items: Galvanized in accordance with ASTM A123 to 2.0 oz/sq ft.

C. Hardware: Refer to Section 08 7100.

D. Apply one coat of bituminous paint to concealed surfaces in contact with cementitious or dissimilar materials.

E. Touch-Up Primer for Steel Components: SSPC 25, red oxide.

F. Touch-Up Primer for Galvanized Steel Surfaces: SSPC 20, zinc rich.

G. Extent of Finish:
   1. Apply factory coating to all surfaces exposed at completed assemblies.
   2. Apply finish to surfaces cut during fabrication so that 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

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify dimensions, tolerances, and method of attachment with other work.

C. Verify that wall openings and adjoining materials are ready to receive work of this Section.

3.02 INSTALLATION:

A. Install wall system in accordance with manufacturer's instructions and FGIA CWM-1.

B. Install assembly plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Exterior Locations: Apply insulating foam sealant to perimeter voids in accordance with Section 07 2100 to maintain continuity of thermal barrier. Coordinate attachment and seal of perimeter air barrier and vapor retarder materials.

G. Install flashings where scheduled. Turn up ends and edges; seal to adjacent work to form water tight dam.

H. Set thresholds and sill members in bed of mastic and secure.

I. Install hardware using templates provided.

J. Install perimeter sealant; type, backing materials, and installation criteria in accordance with Section 07 9200.

K. Install glass in accordance with Section 08 8000.

3.03 ERECTION TOLERANCES:

A. Maximum Variation from Plumb: 0.06 inch every 3 ft non-cumulative or 1/16 inch per 10 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING: In accordance with Section 01 7000.

A. Adjust operating hardware for smooth operation.

3.05 CLEANING: In accordance with Section 01 7700.

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

D. Protect finished Work from damage.

END OF SECTION

SECTION 08 7100 – DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Hardware for wood and aluminum doors.
   2. Keying.
   3. Low voltage control wiring.

B. Related Requirements:
   1. Section 01 1117 – Owner-Supplied Products: Access control systems.
   2. Section 08 1213 – Hollow Metal Frames.
   3. Section 08 1400 – Wood Doors.
   4. Section 08 4113 – Aluminum Entrances and Storefronts.
   5. Section 10 1402 – Interior Signage.
   6. Section 12 3000 – Casework: Cabinet hardware.
   7. Division 26 – Electrical: Power supply to electric hardware devices; installation of low voltage wiring.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate locations and mounting dimensions of each type of hardware, schedules, and catalog cuts.
   1. Keying: Include minutes of keying meeting, keying schedule with Owner review comments incorporated, and number of keys.
   2. Wiring Diagrams: Provide for each opening containing electrically operated hardware. Indicate electrical characteristics and connection requirements; wire and conduit type, size, and location; point-to-point wiring requirements; power supplies and accessories. Identify interfaces to the work of other trades, and requirements affecting their work.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Record actual locations of installed cylinders and their key code.

B. Fire Door Assembly Inspection Reports: In accordance with NFPA 80.

C. Maintenance Data: Include data on operating hardware, adjustment procedures, lubrication requirements, and inspection procedures related to preventative maintenance.

D. Maintenance Products: Provide special wrenches and tools applicable to each different or special hardware component. Provide maintenance tools and accessories supplied by hardware component manufacturer.

E. Keys: Deliver to Owner by security shipment direct from hardware supplier. Tag master keys with project name and geographical location. Tag change keys with door number and location in building. Include schematic drawing of keying and explanation of lock operating features, including method of rendering construction master keys inoperative.

1.04 QUALITY ASSURANCE:

A. Perform Work in accordance with applicable requirements of ADA, AWI, BHMA, DHI, NFPA, and UL.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Hardware Supplier Qualifications: Company specializing in supplying commercial and institutional door hardware with minimum three years documented experience; approved by manufacturers.

D. Hardware Supplier Personnel: Employ a Door and Hardware Consultant (DHC) and Access Control System Consultant (ACSC) or personnel with similar qualifications to assist in the work of this section.

1.05 REGULATORY REQUIREMENTS:

A. Hardware for Fire Rated Openings: Conform to NFPA 80, UL 10B, and applicable building code. Provide closers, exit devices and all other hardware required for fire rating classification indicated, whether or not specifically scheduled.

1.06 DELIVERY, STORAGE AND PROTECTION: In accordance with Section 01 6000.

A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.07 PROJECT CONDITIONS: In accordance with Section 01 3100.

A. Furnish hardware of proper design and function for the door and frame conditions, dimensions, profile, swing, and performance requirements indicated.

B. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.

C. Sequence installation of surface applied hardware items with painting and finishing of the substrates involved.

D. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

PART 2 PRODUCTS

2.01 COMPONENTS:

A. Butt Hinges: ANSI A156.1; 5 knuckle full mortise type; 4½ x 4½ inch.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Ives.
   b. Assa Abloy Architectural Door Accessories; McKinney.
   c. Bommer Industries, Inc.
   d. Hager Hinge Co.
   e. Stanley Security Solutions.
2. Interior Type: ANSI A8112; steel. (McKinney TA2714, Bommer BB5000, Hager BB1279, Ives 5BB1, Stanley FBB179)
3. Heavy Duty Interior Type: ANSI A8111; steel. (McKinney T4A3786, Bommer BB5004, Hager BB1168, Ives 5BB1 HW, Stanley FBB168)

B. Exit Devices: UL 305 panic hardware; ANSI A156.3, Grade 1; free egress from push side.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Von Duprin.
   b. Assa Abloy Electronic Security Hardware; Securitron.
   c. Dorma USA, Inc.
   d. Sargent Manufacturing Co.
   e. Stanley Security Solutions; Precision.
2. Lever Trim: Sargent ETL; Von Duprin 996L06; Dorma YR; Precision 4900A.
3. Rim Exit Devices:
   a. Passage Exit, Fire Rated Openings: ANSI 14 passage function with lever, UL listed. (Sargent 12-8815, Von Duprin 99L-BE-F, Dorma F9300-23, Precision FL2114)
   b. Locking Exit: ANSI 08 function with lever, interchangeable core cylinder, and interchangeable core dogging cylinder. (Sargent 16-8813, Von Duprin CD99L, Dorma 9300CD-08, Precision 2108CD)
   c. Locking Exit with Alarm: ANSI 08 function with lever; battery powered alarm in push rail, armed and disarmed by key; LED status indicators; automatic reset after 3 to 4 minutes; warning label. (Sargent AL-8813, Von Duprin SD99L-ALK-AR3, Dorma 9300CD-08-BPAR, Precision 2108ALK)
   d. Electrically Actuated Exit: Electric latch retraction and dogging, with latch monitor switch; with power supply, controller, and power transfer.
      (1) Exit Only: Interchangeable core dogging cylinder; exterior pull specified separately. (Sargent 16-55-56-8810, Von Duprin LX-SD-QEL99EO, Dorma 9300CD-MLR-LM, Precision ELR-LS2101CD)

(2) Power Supply: Voltage, amperage, and control circuits as required for application. (Sargent 3500 series, Von Duprin PS900 series, Dorma PS500 series, Precision ELR150 series, Securitron BPS series)

(3) Power Transfer: Raceway and wiring for concealed power from frame to door. (Von Duprin EPT-2, Dorma ES105, Securitron CEPT series, Precision EPT-12C, or concealed circuit hinge by hinge supplier)

4. Concealed Vertical Latch Exit Devices: Cables may be used in lieu of rods where available. Bottom latch may be omitted from interior doors unless required by UL listing.
   a. Exit Only: ANSI 01 function; exterior pull specified separately. (Sargent 8610, Von Duprin LD9947EO, Dorma LD9100-01, Precision 2801)
   b. Electrically Actuated Exit: Electric latch retraction and dogging, with latch monitor switch; with power supply, controller, and power transfer.
      (1) Exit Only: Interchangeable core dogging cylinder; exterior pull specified separately. (Sargent 16-55-56-8610, Von Duprin LX-SD-QEL9947EO, Dorma 9100CD-MLR-LM, Precision ELR-LS2801CD)
      (2) Dummy Lever Trim: Interchangeable core dogging cylinder; lever pull. (Sargent 16-55-56-8610, Von Duprin LX-SD-QEL9947L-DT, Dorma 9100CD-MLR-LM, Precision ELR-LS2802CD)
      (3) Power Supply: Voltage, amperage, and control circuits as required for application. (Sargent 3500 series, Von Duprin PS900 series, Dorma PS500 series, Precision ELR150 series, Securitron BPS series)
      (4) Power Transfer: Raceway and wiring for concealed power from frame to door. (Von Duprin EPT-2, Dorma ES105, Securitron CEPT series, Precision EPT-12C, or concealed circuit hinge by hinge supplier)
5. Coordinate exit device width with door size; housing shall extend full width of door.

C. Vertical Rod Locks: Concealed top rod, less bottom rod; free egress from pull side.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Sargent Manufacturing Co.
   2. Lever Trim: Sargent ETL.
   3. Classroom Type: Push side locked and unlocked by key. (Sargent NB-WD701513)
   4. Storeroom Type: Push side unlocked by key; relocks when key is removed. (Sargent NB-AL701506)
   5. Electrically Unlocked Type: Push side lever electrically unlocked, fail secure; with power supply, controller, and power transfer. (Sargent NB-AL711574)
      a. Power Supply: Voltage, amperage, and control circuits as required for application. (Sargent 3500 series, Securitron BPS series)
      b. Power Transfer: Raceway and wiring for concealed power from frame to door. (Securitron CEPT series, or concealed circuit hinge by hinge supplier)

D. Mortise Locks: ANSI A156.13, Series 1000, Grade 1.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Schlage.
   b. Assa Abloy Electronic Security Hardware; Securitron.
   c. Dorma USA, Inc.
   d. Sargent Manufacturing Co.
   e. Stanley Security Solutions; Best Access Systems.
2. Lever Trim: Sargent LNL; Schlage 06; Dorma LRA; Best 15H.
3. Passage Type: ANSI F01 function. (Sargent 8215, Schlage L9010, Dorma M9010, Best 45H-0N)
4. Office Type: ANSI F04 function. (Sargent 8205, Schlage L9050, Dorma M9050, Best 45H-7AB)
5. Classroom Type: ANSI F05 function. (Sargent 8237, Schlage L9070, Dorma M9070, Best 45H-7R)
6. Storeroom Type: ANSI F07 function. (Sargent 8204, Schlage L9080, Dorma M9080, Best 45H-7D)
7. Privacy Type: ANSI F19 function with emergency exterior release; color coded "occupied" indicator. (Sargent 49-8266, Schlage L9496, Best 45H-0L-VIN)
8. Electrically Unlocked Type: ANSI EU function; fail secure. (Sargent 8271, Schlage L9092EU, Dorma M9080EU, Best 45HW-7DEU)
   a. Power Supply: Voltage and amperage as required for application. (Sargent 3500 series, Schlage PS900 series, Dorma ES100, Precision PS160 series, Securitron BPS series)
   b. Power Transfer: Raceway and wiring for concealed power from frame to door. (Von Duprin EPT-10, Dorma ES105, Securitron CEPT series, Precision EPT-12C, or concealed circuit hinge by hinge supplier)
9. Padlocks: Interchangeable core type. (Sargent 758-HS; Schlage KS43D2300 with cylinder; Best 41B722T)

E. Closers: ANSI A156.4, Grade 1; rated for 10 million cycles.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; LCN Closers.
   b. Dorma USA, Inc.
   c. Sargent Manufacturing Co.
   d. Stanley Security Solutions.
2. Standard Type: Pull side mounting. (Sargent 351-O, LCN 4011, Dorma 8916-AF89, Stanley D-4551)
3. Parallel Type: Push side mounting. (Sargent 351-P9, LCN 4111, Dorma 8916-AF89P, Stanley D-4550)

4. Parallel Stop Type: Push side mounting. (Sargent 351-CPS, LCN 4111-3077CNS, Dorma 8916-DS, Stanley D-4550S)
5. Increase sizes in accordance with manufacturer's requirements for door widths larger than 36 inches.

F. Overhead Stops and Holder/Stops: Extruded track, slide, arm, and frame bracket.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Glynn-Johnson.
   b. Dorma USA, Inc.
   c. Norton Rixson.
   d. Sargent Manufacturing Co.
2. Concealed Stop: Sargent 698S; Glynn-Johnson 104S; Rixson 1-336; Dorma 912S.
3. Concealed Stop/Holder: Sargent 698H; Glynn-Johnson 104H; Rixson 1-326; Dorma 912H.
4. Increase sizes in accordance with manufacturer's requirements for door widths larger than 36 inches.

G. Plates and Trim:

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Ives.
   b. Assa Abloy Architectural Door Accessories; Rockwood.
   c. Baldwin Hardware Manufacturing Corp.
   d. Hiawatha, Inc.
   e. Sargent Manufacturing Co.
2. Kickplates: Stainless steel, 0.050 inch thick, 10 inch height; 2 inches less than single door width; 1 inch less than leaf width for pairs without mullions. (Rockwood K1050, Ives 8400)
3. Push Bars for Aluminum Doors: 1 inch diameter, 2½ inch projection; door width less one stile width. (Rockwood 47, Ives 9100HD)
4. Pulls for Aluminum Doors: 1 inch diameter, 3½ inch projection, with 90 degree offset; minimum 9 inch mounting spacing. (Rockwood BF157A, Sargent 862, Ives 8190EZHD-0)
5. Wall Stops: Metal body with resilient bumper; 2½ inch diameter plate with concealed mounting; concave bumper; ¾ inch projection. (Rockwood 409, Ives WS406CCV)
6. Wall Holder/Stops: Door mounted hook with wall mounted spring loaded roller catch; adjustable strike angle. (Ives WS45)

H. Contact Switches: Low voltage SPDT switch.

1. Manufacturers: In accordance with Section 01 6000.
   a. Allegion PLC; Schlage.
   b. Assa Abloy Electronic Security Hardware; Securitron.
   c. Folger Adam Security, Inc.
   d. George Risk Industries, Inc.
   e. Sargent Manufacturing Co.
2. Swing Doors: Concealed mounting. (Sargent 3287, Schlage 679-05 series, Securitron DPS series)
3. Overhead Doors and Roof Hatches: Surface mounting. (Sargent 3285, Schlage 7766)
4. Conduit: In accordance with Division 26.

I. Control Wiring: Furnish low voltage wiring for electrically operated components; in accordance with manufacturer's recommendations.

2.02 KEYING:

A. Door Locks: Grand master keyed.

B. Include control keying with interchangeable core cylinders.
   1. Provide temporary construction cores, keyed alike, for all doors which must be locked during construction. Provide temporary plastic covers for locks not equipped with construction cores.

C. Keying Meeting: Convene after award of contract and before preparation of hardware submittals. Require attendance of Owner, Architect, Contractor, and Hardware Supplier. Review preliminary keying schedule and number of each key to be supplied; revise as necessary to meet Owner's requirements.

D. Keying System: Patented key control with side or bottom pins in addition to conventional pin tumbler keyway. (Sargent Signature Series, Schlage Primus XP, Best Cormax)
   1. Access Control Openings: Provide security cylinders with side or bottom pins.
   2. Openings Without Access Control: Provide conventional pin tumbler cylinders without side or bottom pins.

E. Supply keys in the following quantities:
   1. 4 grand master keys.
   2. Construction master keys as required by Contractor, plus 4 keys for Owner and Architect.
   3. 4 keys for each master key and change key, except as otherwise noted.
      a. Provide minimum 2 keys per keyed cylinder.
   4. 5 control keys and 10 extra cylinder cores.
   5. 100 spare key blanks.

F. Key dogging cylinders cylinders alike to other cylinders at each door, unless noted otherwise.

2.03 ACCESSORIES:

A. Security Key Box: Recessed mount with hinged door.
   1. Manufacturer: Knox Company; Knox-Box 3200 Series. Obtain order form from local fire department.
   2. Backbox: Steel mounting box for recessed installation in masonry.
   3. Case: ¼ inch thick steel; all welded construction; with mounting flange.
   4. Door: ½ inch thick steel with interior gasket seal.
   5. Lock: UL listed; double-action rotating tumblers and hardened steel pins accessed by biased cut key, keyed to fire department master key; stainless steel dust cover with mounting provisions for tamper seal.
   6. Finish: Zinc-phosphate pre-treatment; weather resistant interior and exterior polyester powder coat, aluminum color to match storefront.

B. Key Cabinet:
   1. Cabinet Construction: Sheet steel or aluminum; piano hinged door with lock masterkeyed to building system.
   2. Cabinet Size: Size for project keys plus 10 percent growth.
   3. Horizontal metal strips for key hook labeling with clear plastic strip cover over labels.
   4. Finish: Baked enamel or brushed aluminum.

2.04 FINISHES:

A. Geared Hinges: Finish to match storefront framing.

B. Butt Hinges, Exit Devices, Mortise Locks, Cylinders, and Pulls:
   1. Wood Doors: US 26D; BHMA 626.
   2. Aluminum Doors: Finish to match storefront framing.

C. Closers: Painted enamel finish.
   1. Wood Doors: Aluminum powder coat; BHMA 689.
   2. Aluminum Doors: Finish to match storefront framing.

D. Plates and Stops: US 32D; BHMA 630.

E. Thresholds: Clear anodized aluminum.

F. Weatherstrips and Sweeps:
   1. Wood Doors: Clear anodized aluminum.
   2. Aluminum Doors: Finish to match storefront framing.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that doors and frames are prepared to receive scheduled hardware and dimensions are as indicated on shop drawings and as instructed by manufacturer.

C. Verify that electric power is available to power operated devices and is of the correct characteristics.

3.02 INSTALLATION:

A. Install hardware in accordance with manufacturer's instructions.

B. Use templates provided by hardware item manufacturer.

C. Hardware Mounting Heights: In accordance with DHI.

D. Closers: Coordinate configuration of closers and arms to allow interior doors to swing 180 degrees or to nearest adjacent wall.

E. Kickplates: Mount on push side of door, flush with bottom of door, unless specifically indicated. Center between frame stops, or between frame stop and edge of door at pairs of doors without mullions.

F. Stops: Coordinate location and installation with levers, pulls, and other hardware for proper clearance and function. Provide shims, blocking, or other components as necessary; coordinate finishes with Architect where exposed.
   1. Provide wall stop, overhead stop, or closer with stop for all doors. At locations where type of stop scheduled does not suit field conditions, contact Architect for resolution. Upon request by Architect, change type of stop for up to 5 percent of openings without additional charge.

G. Contact Switches: Coordinate location and installation with security system installer. Maintain gap distance between switch and magnet as recommended by manufacturer for proper operation.

H. Security Key Box: Coordinate location and installation with local fire department and security system installer, approximately 6 feet above grade.

I. Low Voltage Control Wiring: Install in accordance with manufacturer's recommendations.

J. Coordinate with Section 28 1000 for access control system interconnection of electrified hardware. Wiring, final connections, programming, and accessories shall be by access control system installer.
   1. All doors shall have free egress at all times.

3.03 ADJUSTING:

A. Adjust hardware for smooth operation.

B. Adjust hardware to provide operating and door opening forces in accordance with ADA and NFPA, maximum 5 lbf for non-rated interior doors.

C. Adjust closers for proper closing speed and latching speed after HVAC balancing is complete.

3.04 PROTECTION OF FINISHED WORK:

A. Do not permit adjacent work to damage hardware or finish.

3.05 SCHEDULE:

A. Set No. 1: Door 100A.
   1. Exit Device (RHR Leaf): Electrically actuated concealed vertical latch type; exit only.
   2. Exit Device (LHR Leaf): Exit only concealed vertical latch type.
   3. Pulls (2).
   4. Contact switches (2).
   5. Security key box; locate as directed by fire department.
   6. Balance of hardware by aluminum door supplier, including threshold, sweeps, and closers with stops.
   7. Sequence of Operation: Proximity reader shall shunt door contact and retract exit device latch.

B. Set No. 2: Doors 149B, S21B.
   1. Exit Device: Electrically actuated rim type; exit only.
   2. Pull.
   3. Contact switch.
   4. Balance of hardware by aluminum door supplier, including threshold, sweep, and closer with stop.
   5. Sequence of Operation: Proximity reader shall shunt door contact and retract exit device latch.

C. Set No. 3: Door 119A.
   1. Vertical Rod Lock (RH leaf): Electrically unlocked type.
   2. Vertical Rod Lock (LH leaf): Storeroom type.
   3. Wall holder/stop (RH leaf).
   4. Overhead holder/stop (LH leaf).
   5. Contact switches (2).
   6. Balance of hardware by aluminum door supplier, including closers.
   7. Sequence of Operation: Proximity reader shall shunt door contact and unlock lever.

D. Set No. 4: Doors 208A, 208B.
   1. Electrically unlocked mortise lock.
   2. Wall stop.
   3. Contact switch.
   4. Balance of hardware by aluminum door supplier, including closer.
   5. Sequence of Operation: Proximity reader shall shunt door contact and unlock lever.

E. Set No. 5: Door 100B.
   1. Push bars (2).

2. Pulls (2).
3. Balance of hardware by aluminum door supplier, including closers with stops.

F. Set No. 6: Door 152.
1. Butts (6): Heavy duty interior type.
2. Exit Device (RHR Leaf): Electrically actuated concealed vertical latch type; dummy lever.
3. Exit Device (LHR Leaf): Concealed vertical latch type; exit only.
4. Closers (2): Parallel type.
5. Wall stops (2).
6. Kickplates (2).
7. Contact switches (2).
8. Sequence of Operation: Switch at reception desk shall unlock lever.

G. Set No. 7: Doors S21A, S22.
1. Butts (3): Heavy duty interior type.
2. Fire Exit Device: Passage type.
3. Closer: Standard type.
4. Wall stop.
5. Kickplate.

H. Set No. 8: Door 149A.
1. Butts (3): Heavy duty interior type.
2. Exit Device: Locking type with alarm.
3. Closer: Parallel type.
4. Wall stop/holder.
5. Kickplate.

I. Set No. 9: Doors 150, 151A, 151B.
1. Butts (3): Heavy duty interior type.
2. Exit Device: Locking type.
3. Closer: Parallel type.
4. Wall stop/holder.

J. Set No. 10: Doors 117, 120, 143.
1. Butts (3): Heavy duty interior type.
2. Exit Device: Locking type.
3. Closer: Parallel type.
4. Wall stop.
5. Kickplate.

K. Set No. 11: Doors 111, 112, 113, 114, 115, 116, 220.
1. Butts (3): Heavy duty interior type.
2. Electrically unlocked mortise lock.
3. Closer: Standard type.
4. Wall stop.
5. Contact switch.

6. Sequence of Operation:
   a. Door 111:
      (1) Switch at reception desk shall unlock lever.
      (2) Proximity reader shall unlock lever.
   b. Doors 112, 113, 114, 115, 116, 220: Proximity reader shall unlock lever.

L. Set No. 12: Door 213.
   1. Butts (3): Heavy duty interior type.
   2. Electrically unlocked mortise lock.
   3. Closer: Standard type.
   4. Overhead stop.
   5. Contact switch.
   6. Sequence of Operation: Proximity reader shall unlock lever.

M. Set No. 13: Door 248.
   1. Butts (3): Heavy duty interior type.
   2. Electrically unlocked mortise lock.
   3. Closer: Parallel stop type.
   4. Contact switch.
   5. Sequence of Operation: Proximity reader shall unlock lever.

N. Set No. 14: Door 145A.
   1. Butts (6): Heavy duty interior type.
   2. Vertical Rod Locks (2): Classroom type.
   3. Closers (2): Standard type.
   4. Wall stop/holder (LH leaf).
   5. Overhead stop/holder (RH leaf).
   6. Kickplates (2).

O. Set No. 15: Door 145B.
   1. Butts (6): Heavy duty interior type.
   2. Vertical Rod Locks (2): Classroom type.
   3. Closers (2): Standard type.
   4. Overhead stop/holders (2).
   5. Kickplates (2).

P. Set No. 16: Door 157.
   1. Butts (3): Heavy duty interior type.
   2. Mortise classroom lock.
   3. Closer: Standard type.
   4. Wall stop/holder.

Q. Set No. 17: Doors 221, 222, 223, 258, 259.
   1. Butts (3): Interior type.
   2. Mortise classroom lock.
   3. Wall stop.

R. Set No. 18: Door 138.
   1. Butts (3): Heavy duty interior type.
   2. Mortise passage latch.
   3. Closer: Standard type.
   4. Wall stop.

S. Set No. 19: Doors 141, 261.
   1. Butts (3): Heavy duty interior type.
   2. Mortise passage latch.
   3. Closer: Standard type.
   4. Wall stop/holder.

T. Set No. 20: Door 140.
   1. Butts (3): Heavy duty interior type.
   2. Mortise passage latch.
   3. Closer: Standard type.
   4. Overhead stop.

U. Set No. 21: Doors 102, 156.
   1. Butts (3): Interior type.
   2. Mortise passage latch.
   3. Wall stop.

V. Set No. 22: Doors 125, 136, 146, 224.
   1. Butts (3): Heavy duty interior type.
   2. Mortise storeroom lock.
   3. Closer: Standard type.
   4. Wall stop.

W. Set No. 23: Door 142.
   1. Butts (3): Heavy duty interior type.
   2. Mortise storeroom lock.
   3. Closer: Standard type.
   4. Wall stop/holder.
   5. Kickplate.

X. Set No. 24: Door 260.
   1. Butts (3): Heavy duty interior type.
   2. Mortise storeroom lock.
   3. Closer: Parallel type.
   4. Wall stop.

Y. Set No. 25: Doors 124, 236.
   1. Butts (3): Interior type.
   2. Mortise storeroom lock.
   3. Wall stop.

Z. Set No. 26: Door 134.
   1. Butts (3): Heavy duty interior type.
   2. Mortise office lock.
   3. Closer: Standard type.
   4. Wall stop.

AA. Set No. 27: Doors 104, 105, 106, 107, 108, 109, 110, 126, 127, 132, 153, 154, 203, 204, 205, 206, 207, 210, 211, 216, 217, 218, 219, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 240, 245, 246, 254, 255, 256.
   1. Butts (3): Interior type.
   2. Mortise office lock.
   3. Wall stop.

BB. Set No. 28: Doors 121, 122, 123, 128, 129, 130, 131, 135, 147, 148, 155, 237, 238, 239, 241, 242, 243.
   1. Butts (3): Heavy duty interior type.
   2. Mortise privacy lock.
   3. Closer: Standard type.
   4. Wall stop.

CC. Set No. 29: Doors 137, 247.
   1. Butts (3): Interior type.
   2. Mortise privacy lock.
   3. Wall stop.

DD. Exterior Overhead Doors:
   1. Contact switch.

EE. Roof Hatches:
   1. Contact switch.

END OF SECTION

SECTION 08 8000 – GLAZING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Annealed glass.
   2. Laminated glass.
   3. Insulating glass units.
   4. Safety glazing.
   5. Glazing accessories.

B. Related Requirements:
   1. Section 07 9200 – Joint Sealants.
   2. Section 08 1213 – Hollow Metal Frames.
   3. Section 08 1400 – Wood Doors.
   4. Section 08 4113 – Aluminum Entrances and Storefronts.

1.02 DESIGN REQUIREMENTS:

A. Size glazing in accordance with ASTM E1300 to withstand dead loads and positive and negative live loads acting normal to the plane of glazing in accordance with applicable building code.

B. Limit glazing deflection to ¾ inch or flexure limit of glazing with full recovery, whichever is less.

C. Performance Requirements for Glass Guard Assembly:
   1. Fabricate assembly to resist a concentrated load of 200 lbs applied in any direction at any point, and a uniform load of 50 lb/ft applied in any direction. Concentrated loads and uniform loads are not applied simultaneously.
   2. Fabricate assembly to resist a point load of 50 lbs on one square foot applied perpendicular to guard at any location.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate installation layouts.

B. Glass Guards: Provide calculations and details.

1.04 QUALITY ASSURANCE:

A. Each glass lite shall bear the manufacturer's label designating the type and thickness of glass.
   1. Permanently identify each lite of tempered glass with identification etched or ceramic-fired on the glass and visible when the unit is installed.

B. Provide safety glazing in accordance with ANSI Z97.1.

1.05 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver glazing with manufacturer's labels intact. Do not remove label until glazing has been installed.

1.06 WARRANTY: In accordance with Section 01 7700.

A. Each lite of glass and each sealed glass unit shall have a 10 year manufacturer warranty against defects, including but not limited to seal failure, interpane dusting or misting.

B. Laminated Glass: Provide 10 year warranty against delamination.

PART 2 PRODUCTS

2.01 GLASS:

A. Manufacturers and Fabricators: In accordance with Section 01 6000.
   1. Vitro Architectural Glass.
   2. AGC, Inc.
   3. Cardinal Glass Industries, Inc.
   4. Guardian Industries Corp.
   5. Kuraray America, Inc.
   6. Oldcastle BuildingEnvelope.
   7. Pilkington North America, Inc.
   8. Viracon, Inc.

B. Annealed Glass: ASTM C1036, Type I, Class 1, Quality q3; clear.

C. Low-Emissivity Coated Glass: ASTM C1036, Type I, Class 1, Quality q3; clear annealed float glass with pyrolitic coating. (Vitro Solarban 60; Guardian SN68; AGC Energy Select 40)

D. Laminated Glass for Glass Guards: 9/16 inch thick or as required for loading conditions; two equal layers with ionoplast polymer interlayer. (Kuraray SentryGlas)

2.02 FRAMING ACCESSORIES:

A. Manufacturers: In accordance with Section 01 6000.
   1. C. R. Laurence Co., Inc.

B. Glass Guard Standoff Fittings: Stainless steel with satin finish; 4 x 9¼ inch backplate predrilled for mounting; two standoffs with domed caps and threaded stainless steel rods for attachment to backplate. (CRL RS0B25BS)
   1. Glass Guard: Laminated tempered glass, with two ¾ inch holes per standoff fitting and minimum two fittings per glass panel at 24 inch maximum spacing; 48 inch maximum glass panel width with ½ inch spacing between panels; eased edges.

2.03 GLAZING ACCESSORIES:

A. Setting Blocks: ASTM C864, neoprene, 80 to 90 Shore A durometer hardness; compatible with sealant materials; length 4 inches, width of glazing rabbet space less 1/16 inch, height required for glazing method, pane weight, and pane area.

B. Spacer Shims: ASTM C864, neoprene, 50 to 60 Shore A durometer hardness; compatible with sealant materials; length 3 inches, one half height of glazing stop, thickness required for application, one face self-adhesive.

C. Glazing Tape: Butyl compound tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation.

D. Glazing Splines and Glazing Gaskets: ASTM C864 and ASTM D2287, resilient polyvinyl chloride, extruded shape to fit glazing channel retaining slot; black color.

E. Glazing Clips: Manufacturer's standard type.

F. Sealants: As specified in Section 07 9200.

2.04 FABRICATION:

A. Tempered Glass:
   1. Cut float glass materials to indicated sizes and provide cut-outs and holes, if indicated, before heat strengthening.
   2. Grind and polish exposed edges, where indicated, prior to tempering.
   3. Fully temper float glass materials in accordance with ASTM C1048, Kind FT.

B. Laminated Glass:
   1. Cut float glass materials to indicated sizes and provide cut-outs and holes, if indicated, before heat strengthening.
   2. Heat strengthen float glass materials in accordance with ASTM C1048, Kind HS.
   3. Laminate plastic interlayer between glass panes in accordance with ASTM C1172.
   4. Fabricate laminated glass to conform to Glass Association of North America (GANA) Laminated Glass Design Guide and ANSI Z97.1, Class A.

C. Sealed Insulating Glass Units: Provide unit edge seals meeting requirements of ASTM E773, with aluminum spacers having mitered corners, and silicone sealant for glass-to-spacer seals. Where tempered glass is indicated, both outer and inner panes shall be tempered.
   1. Outer Pane: ¼ inch thick; low-emissivity coated glass.
   2. Air Space: ½ inch thick; dehydrated, hermetically sealed.
   3. Inner Pane: ¼ inch thick; clear annealed glass.
   4. Solar Heat Gain Coefficient (SHGC): NFRC 200; maximum 0.38.
   5. Visible Light Transmittance: NFRC 200; minimum 68%.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Inspect openings prior to commencing work to verify that conditions do not interfere with proper glazing installation.

B. Verify glazing sizes in comparison with opening size to confirm that adequate clearances in accordance with Flat Glass Marketing Association (FGMA) standards are maintained on all four edges at perimeter, and that stops are of proper size.

C. Verify that glazing channels and recesses are clean and free of obstructions, that weeps are clear, and that channels and recesses are ready for glazing.

3.02 PREPARATION:

A. Clean contact surfaces to receive sealant with solvent; wipe dry.

B. Seal porous glazing channels and recesses with primer or sealer compatible with substrate.

C. Prime surfaces to receive sealant in accordance with sealant manufacturer's instructions.

3.03 INSTALLATION:

A. Perform glazing work in accordance with FGMA standards and glazing manufacturer's recommendations.

B. Exercise care in cutting and handling of glass to have clean cut edges, free of any defects or damage which would interfere with the installation.

C. Replace all glass broken or damaged in the process of the work. Replace glass which is cracked or broken by others at the expense of the party causing damage.

D. Installation Methods: As scheduled at the end of this Section, and in accordance with recommendations of manufacturers of doors, windows and framing systems.

1. Exterior Dry Method (Tape and Gasket Spline):
   a. Apply glazing tape or spline to glass; butt-joint tape edges; seal joints with sealant.
   b. Locate setting blocks in accordance with FGIA TM-3000.
   c. Set glass unit on setting blocks; apply pressure against fixed stop for full contact.
   d. Install removable stops without displacing glazing tape or spline; apply pressure for full continuous contact.
   e. Trim sight-exposed tape flush with stop.

2. Interior Dry Method (Tape and Tape):
   a. Apply glazing tape to permanent stops, allowing tape edge to project 1/16 inch above stop; butt-joint tape edges; seal joints with sealant.

b. Place setting blocks with edge blocks maximum 6 inches from glass edges and intermediate blocks at ¼ points of glass panel length.
c. Set glass unit on setting blocks; apply pressure against fixed stop for full contact.
d. Apply glazing tape on free perimeter of glazing as described above.
e. Install removable stops without displacing glazing tape; apply pressure for full continuous contact.
f. Trim sight-exposed tape flush with stop.

3. Interior Wet Method (Compound and Compound):
   a. Place setting blocks at ¼ points; install glazing unit.
   b. Install applied stops; center glass unit in space by inserting spacer shims both sides at intervals of 24 inches; set spacer shims ¼ inch below sight line.
   c. Locate and secure glazing pane using glazer's clips.
   d. Fill gaps between glazing and stops with glazing compound flush with sight line; tool surface to straight line.

3.04 CLEANING: In accordance with Section 01 7700.

A. Remove excess glazing materials and sealants immediately after glazing operation is completed.

B. Remove labels from glass immediately after Substantial Completion.

3.05 SCHEDULE:

A. Safety Glazing: Provide tempered glass at the following locations, at locations required by applicable building code, and where indicated:
   1. In ingress and egress doors.
   2. In fixed panels having a glazed area in excess of 9 square feet with the lowest edge less than 18 inches above the finish floor level or walking surface within 36 inches of such glazing.
      a. Safety glazing is not required when glazed panels have a horizontal mullion located between 24 and 36 inches above the walking surfaces.
   3. In fixed or operable panels adjacent to a door and within the same plane as the door whose nearest vertical edge is within 24 inches of the door in a closed position and whose bottom edge is less than 60 inches above the floor or walking surface.

B. Installation Methods:
   1. Hollow Metal Borrowed Lites: Dry method.
   2. Wood Doors: Wet method.
   3. Aluminum Entrances and Storefronts: Dry method.

END OF SECTION

SECTION 09 2210 – METAL SUPPORT SYSTEMS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Non-load bearing metal framing.
   2. Metal furring.
   3. Suspension systems for gypsum board ceilings.

B. Related Requirements:
   1. Section 05 4000 – Cold Formed Metal Framing: Load bearing metal framing.
   2. Section 05 5000 – Metal Fabrications: Supplemental support framing.
   3. Section 07 2100 – Thermal Insulation.
   4. Section 09 2900 – Gypsum Board.
   5. Section 09 5100 – Acoustical Ceilings.
   6. Section 09 8100 – Acoustic Insulation.

1.02 PERFORMANCE REQUIREMENTS:

A. Maximum Allowable Deflection: 1/360 of span.

1.03 REGULATORY REQUIREMENTS:

A. Conform to applicable building code and ASTM E119 for fire rated assemblies in conjunction with Section 09 2900.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. ClarkDietrich Building Systems.

B. Jaimes Industries, Inc.

C. J. N. Linrose Manufacturing.

D. MRI Steel Framing, LLC.

E. State Building Products.

F. Steel Structural Products LLC.

G. Ware Industries, Inc.; Marino Ware.

2.02 MATERIALS:

A. Materials: ASTM C645; fabricated from ASTM A653 sheet steel with minimum G40 galvanized coating, roll formed.

B. Interior Components: Minimum 20 gauge; 0.0312 inch minimum base metal thickness, or embossed pattern with equivalent structural properties documented by third party testing acceptable to authorities having jurisdiction.

C. Exterior Components: Minimum 18 gauge; 0.043 inch minimum base metal thickness.

2.03 NON-LOAD BEARING METAL FRAMING:

A. Studs and Framing Components: Channel shape, punched web; sizes as indicated.

B. Shaft Wall Studs: C-H shape; sizes as indicated.

C. Runners: Unhemmed channel shape, unpunched web; sizes as indicated on the Drawings, and as required to accommodate framing and furring members.

D. Headers and Jambs: Factory fabricated from unpunched components, with stiffened flanges.

E. Lateral Bridging:
   1. Unhemmed channel shape, ¾ inch with ½ inch flanges; 16 gauge; 0.054 inch minimum base metal thickness.
   2. Angle shape with prenotched slots to engage cutouts in framing member webs, 7/8 inch x 7/8 inch; 20 gauge; 0.0312 inch minimum base metal thickness.

F. Backing: Flat stock, minimum 6 inch width, minimum 20 gauge thickness.
   1. Where point loads may exceed 250 lbs., including grab bars and shower curtain rods, provide minimum 5 inch wide backing bar with 1¼ inch flanges.

2.04 METAL FURRING:

A. Hat Shaped Furring Channels: Minimum 25 gauge; 0.018 inch minimum base metal thickness; 7/8 inch depth or as indicated.

2.05 SUSPENDED CEILING FRAMING:

A. Grid System: ASTM C635, heavy duty; 1½ inch flange width; commercial quality cold rolled steel; components die cut and interlocking; unpainted.
   1. Manufacturers: In accordance with Section 01 6000.
      a. Armstrong World Industries, Inc.; Drywall Grid System.
      b. CertainTeed Corporation.
      c. Chicago Metallic Corporation; 670-C Drywall Furring System.
      d. USG Corp.; Drywall Suspension System.
   2. Interior Locations: G40 hot dipped galvanized coating.
   3. Exterior Locations: G90 hot dipped galvanized coating.
   4. Hanger Wire: Steel, minimum 12 gauge.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install metal support system products in accordance with standard construction practices and manufacturer's recommended methods. Install members plumb, straight, true, and level to the lines indicated on the drawings. Connect members using welds, screws, or bolts.

3.02 FRAMING AND FURRING:

A. Install metal framing and furring in accordance with ASTM C754.

B. Handle and lift prefabricated panels in a manner to prevent distortion.

C. Securely anchor runners to supporting structure at maximum 24 inches o.c. and 2 inches from each end.

D. At butt joints of runners, securely anchor abutting pieces of runner to a common structural element, or butt-weld or splice components together.

E. Securely attach studs to the flanges or webs of both upper and lower runners, plumb and aligned, with open side of studs facing in same direction. Space framing and furring 16 inches o.c., except where indicated otherwise.
   1. Install double studs at jambs of openings.
   2. Install one stud at each side of expansion and control joints.
   3. Install jack studs or cripples below sills, above opening heads, at stair rails, and elsewhere to furnish support. Securely attach to supporting members.
   4. Position closed side of studs to be in direct contact with door frame jambs, abutting partitions, and partition corners.

F. Where partition extends to underside of structure above, accommodate structural deflection by one of the following methods as approved by framing manufacturer:
   1. Double deep leg head runner with studs secured to lower runner only.
   2. Single deep leg head runner with studs secured to horizontal bridging within 12 inches of track.
   3. Head runner with pre-attached UL classified galvanized steel clips and slotted holes for stud attachment with mechanical fasteners.

G. Where partition does not extend to underside of structure above, provide bracing at approximate 45 degree angle from top of partition to structure, using studs of same size as partition at maximum 32 inches o.c. on alternating sides of partition.

H. At bottom of bulkheads, provide bracing at approximate 45 degree angle from bottom of bulkhead to structure, using framing of same size as bulkhead framing at maximum 32 inches o.c. on alternating sides of bulkhead, or on one side of bulkhead where required by configuration of ceiling and structure.

I. Install bridging, blocking, and anchoring as required to secure the frame rigidly in place and to support the edges of all boards and panels.

J. Install backing required to support and anchor items installed by other trades. Coordinate locations and requirements.

K. Where indicated on the Drawings, install draftstops horizontally and secure to adjacent studs. Cut draftstops from continuous sections of metal framing members without holes or penetrations.

L. Install all lateral bridging required, including the following locations. Bridging may be omitted where spans do not exceed manufacturer's table of limiting heights.
   1. Walls up to 10 ft high: One row at mid-span.
   2. Walls from 10 to 14 ft high: Two rows equally spaced.
   3. Walls above 14 ft high: One row every 4 ft o.c.
   4. At hinge and strike plate locations of doors.
   5. At mid-span locations of bulkheads.

3.03 SUSPENDED CEILING FRAMING:

A. Install suspension system in accordance with ASTM C636 and manufacturer's instructions.

B. Locate system on room axis to a balanced grid design to minimize gypsum board joints. Coordinate layout with HVAC, lighting, and other ceiling mounted components indicated.

C. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

D. Install main runners at 48 inches o.c. at right angles to structural framing, with cross tees at 24 inches o.c. spanning between main runners.

E. Hang suspension system from building structure independent of metal deck, walls, columns, ducts, pipes, and conduit. Install hangers at maximum 48 inches o.c. Provide supplemental steel framing in accordance with Section 05 5000, sized to carry imposed loads, where required to maintain specified hanger spacing.

F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

END OF SECTION

SECTION 09 2900 – GYPSUM BOARD

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Interior gypsum wall and ceiling board.
   2. Backing boards.
   3. Gypsum board finishing.

B. Related Requirements:
   1. Section 05 4000 – Cold Formed Metal Framing: Load bearing metal framing.
   2. Section 09 2210 – Metal Support Systems: Non-load bearing metal framing.
   3. Section 09 3013 – Ceramic Tiling.
   4. Section 09 8100 – Acoustic Insulation.
   5. Section 09 9000 – Painting and Coating.

1.02 QUALITY ASSURANCE:

A. Perform Work in accordance with ANSI A97.1.

1.03 REGULATORY REQUIREMENTS:

A. Conform to applicable building code, GA 600, and ASTM E119 for fire rated assemblies in conjunction with Sections 05 4000 and 09 2210.

1.04 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials in enclosed areas, protected from damage, moisture, and exposure to the elements. Protect ready-mixed joint compounds from freezing.

B. Store panels in a flat, horizontal position. Prevent damage to edges, ends and surfaces of panels. Do not allow panel storage area to exceed 70 percent relative humidity.

C. Do not install panels damaged by moisture or mold, including those with surface contamination, discoloration, swelling, or warping.

D. Exercise caution to prevent damage to windows, doors, floors, and other finished work.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Provide temporary heat, ventilation, and dehumidification in accordance with Section 01 5000 and GA 236 upon beginning gypsum board installation and continuously until finishing is complete and joint compound is fully cured. Maintain ambient temperature between 60 degrees F and 80 degrees F. Maintain relative humidity below 50 percent at 60 degrees F and 70 percent at 80 degrees F.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. CertainTeed Corp.

B. Continental Building Products.

C. Georgia-Pacific Corp.

D. National Gypsum Company, Gold Bond Building Products.

E. USG Corp.

2.02 GYPSUM BOARD:

A. Interior Gypsum Panels: ASTM C1396; tapered edge; 48 inch width, 5/8 inch typical thickness, lengths as long as practical to minimize number of joints.
   1. Fire-Rated Panels: Type X; 5/8 inch typical thickness. Install fire-rated panels at all fire rated assemblies.

B. Glass Mat Faced Gypsum Panels: ASTM C1658; tapered edge; 48 inch width, ½ inch typical thickness, lengths as long as practical to minimize number of joints.
   1. Mold Resistance: ASTM D3273; minimum 8.
   2. Water Absorption: ASTM C473; maximum 10 percent.
   3. Fire-Rated Panels: Type X; 5/8 inch typical thickness. Install fire-rated panels at all fire rated assemblies.

C. Gypsum Shaft Liner Panels: ASTM C1396, Type X; 24 inch width, 1 inch thick; beveled edges; lengths as long as practical to minimize number of joints.

2.03 BACKING BOARDS:

A. Cement Backer Board: ANSI A118.9; Portland cement with polymer-coated, glass fiber mesh; formed edge; 48 inch width, lengths as long as practical to minimize number of joints; ½ inch thick.

2.04 FASTENERS:

A. Fasteners: ASTM C954 or C1002, Type S bugle head screws; minimum length in accordance with GA 216.

B. Fasteners for Backer Board: Manufacturer's standard type for application.

2.05 FINISHING MATERIALS:

A. Sealer for Cement Backer Board: ANSI A136.1, Type I organic adhesive, or as recommended by board manufacturer.

B. Joint Tape: Cross-fibered paper or self-adhesive fiberglass mesh.
   1. Joint Tape for Backer Board: Alkali-resistant fiberglass mesh.

C. Joint Compound: ASTM C475; mix in accordance with manufacturer's recommendations.

1. Use only setting-type joint compounds for Level 1 and Level 2 finish applications, for backer board, and for adhesive application of panels.

D. Corner Bead and Trim: ASTM C1047; galvanized steel with paper facing.

E. Reveal Moldings: Rigid vinyl or extruded aluminum bead; profile as indicated.

1. Manufacturers: In accordance with Section 01 6000.
   a. Trim-Tex, Inc.
   b. ClarkDietrich Building Systems.
   c. Fry Reglet Corp.

F. Control Joint: Roll-formed zinc or extruded PVC.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that framing members are plumb and aligned to permit panel installation in a true surface plane.

B. Verify that all work of other trades which will be concealed or covered by this work has been completed and approved. Such work may include, but not be limited to, blocking, insulation, piping and ductwork, and electrical and communications boxes, conduit, raceway and cable.

3.02 PANEL APPLICATION:

A. Apply panels in accordance with ASTM C840, GA 216, and manufacturer's recommendations.

B. Position panel ends and edges over framing members, except when joints are at right angles to framing members or when end joints are back-blocked.

C. Apply ceiling panels before wall panels. Extend ceiling board into corners and make firm contact with top plate.

D. Apply wall panels perpendicular to studs with end joints positioned over studs. Use maximum practical lengths to minimize end joints.

E. At assemblies with acoustic insulation, apply acoustical sealant to perimeter and penetrations in accordance with Section 09 8100.

F. Fit ends and edges closely, but not forced together. Stagger end joints in successive courses, with joints on opposite sides of a partition placed on different studs.

G. Attach panels to framing members with power-driven screws; draw panels tight to framing. Space fasteners not less than 3/8 inch from edges and ends of panels, and 12 inches o.c. along each framing member in field of panels, or as required by fire rated assembly criteria. Drive fasteners in field of panels first, working toward ends and

edges. Drive fastener heads slightly below surface of panels in a uniform dimple without breaking face paper.

1. Maximum Fastener Spacing at Backer Board: 8 inches o.c.
2. Do not fasten ceiling boards to roof trusses within 16 inches of stud walls parallel or perpendicular to trusses.

H. Adhesive Application: Adhere panels to substrate with 4 beads of joint compound, 3/8 inch wide by ½ inch high and spaced 1½ to 2 inches o.c., at center and near each panel edge. Position panels vertically over wall surface, press into place and provide temporary support until adhesive is hardened.

I. Cut ends, edges, scribe or make cutouts within field of panels with knife and straight edge; square and true to required dimension.

1. Cement Backer Board: Cut panels with carbide-tipped knife and straight edge, or with power saw equipped with dust collection device.

J. Install trim at internal and external angles formed by the intersection of panels with adjacent panels or other surfaces. Apply corner bead to external corners in accordance with manufacturer's directions.

K. Control Joints: Provide separate framing members on each side of joint.

1. Locations: Position to intersect door and window openings where possible. Coordinate with items indicated to be applied to wall surface.
   a. Aligned with control joints and expansion joints in building structure.
   b. Where dissimilar substrates meet without change in surface plane.
   c. Where board surface forms L, U or T shape.
   d. Gypsum Board: Maximum 30 feet o.c. in all directions.
   e. Backer Board: Maximum 16 feet o.c. in all directions.
2. Where control joints occur in fire rated construction or acoustically insulated assemblies, follow GA 234 and manufacturer's instructions to maintain required fire and sound separation.

3.03 FINISHING:

A. Provide surfaces with finishes as scheduled, in accordance with the GA 214 definitions of finishes.

B. Level 0: No finishing required.

C. Level 1: One coat fire-tape application.
1. Cement Backer Board: Apply one coat of sealer to areas to receive joint compound.
2. Board Joints and Interior Angles: Pre-fill abutting tapered panel V-grooves flush with joint compound; wipe off excess. Apply compound in thin uniform layer. Apply joint tape centered over joint and embedded in compound, with sufficient compound remaining under tape to provide proper bond. Fold and embed tape in interior angles to provide true angle.

3. Fasteners: Cover fastener heads with one coat of joint compound; wipe off excess.

D. Level 2: One coat application.
   1. Board Joints and Interior Angles: Finish as specified for Level 1. Follow immediately with thin skim coat to embed tape.
   2. Fasteners: Finish as specified for Level 1.
   3. Bead and Trim: Apply one coat of joint compound over flanges; wipe off excess and apply a thin coat of joint compound over flanges.

E. Level 3: Two coat application.
   1. Finish as specified for Level 2. When first coat is thoroughly dry, apply second coat of compound, extending slightly beyond first coat into face of board. Do not allow finish coat to protrude beyond plane of surface.
   2. Board Joints and Interior Angles: Fill panel taper flush with surface; cover tape and feather out at least two inches beyond first coat. On joints with no taper, cover the tape and feather out at least four inches on each side of tape.

F. Level 4: Three coat application.
   1. Apply final coat of joint compound feathered out over the dry second coat.

G. Level 5: Three coat application with skim coat.
   1. Apply a thin coat of joint compound over entire finished board surface. Wipe down immediately, leaving a tight smooth film of joint compound.

H. Final Finishing (Not Required for Levels 0, 1 and 2):
   1. Sand between coats where necessary and following final coat, to provide flat, smooth surface ready for priming and decoration; free of ridges, tool marks and sanding grooves. Do not abrade adjacent face-paper surfaces.
   2. Inspect finished surfaces and repair all defects, ridges, cracks, blisters, pits, checks, discolorations, and damaged spots.
   3. Ridges: Sand ridges to reinforcing tape without cutting through tape. Fill concave areas on both sides of ridge with topping compound. After fill is dry, blend in topping compound over repaired area.
   4. Cracks: Fill cracks with compound and finish smooth and flush.

3.04 CLEANING:

A. At completion of the work of this section, remove all debris and excess materials. Remove all joint compound from floor and leave all areas broom clean.

3.05 SCHEDULE OF BOARD LOCATIONS:

A. Walls Behind Ceramic Wall Tile: Cement backer board.

B. Locations Within 4 Feet of Lavatories, Sinks, Drinking Fountains, Mop Basins, Clothes Washers, Water Heaters, Water Service Entrances, Sprinkler Risers, and Other Water Sources: Glass mat faced gypsum panels.

C. Other Locations: Gypsum panels.

D. Fire Rated Assemblies: Board as scheduled for location; Type X, 5/8 inch thick.

3.06 SCHEDULE OF FINISHES:

A. Surfaces Indicated as Unfinished (Except Fire Rated Assemblies): Level 0.

B. Surfaces Indicated as Unfinished (Fire Rated Assemblies): Level 1.

C. Surfaces Above Suspended Ceilings: Level 1.

D. Wall Surfaces Indicated to Receive Permanent Wall Paneling: Level 0.

E. Gypsum Board Indicated to Receive Paint: Level 4.

F. Backer Board Indicated to Receive Ceramic Tile: Level 2.

G. Backer Board Indicated to Receive Paint: Level 5.

H. Surfaces Not Otherwise Scheduled: Level 3.

END OF SECTION

SECTION 09 3013 – CERAMIC TILING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Ceramic wall tile.
   2. Ceramic floor tile.

B. Related Requirements:
   1. Section 03 3000 – Cast-in-Place Concrete: Concrete floor slabs.
   2. Section 09 2900 – Gypsum Board: Backer board substrate.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate physical and performance characteristics, and installation instructions.

B. Samples: Submit sample panel of each color, pattern and type of tile scheduled. Provide grout color samples for selection.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Operation and Maintenance Data: Indicate recommendations of tile and grout manufacturers for cleaning products and methods.

1.04 EXTRA MATERIALS: In accordance with Section 01 7700.

A. Provide 2 percent of extra materials to Owner, for each type of tile; in new, unopened, packaging with protective covering for storage, identified with appropriate labels.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Maintain temperature at minimum 50 degrees F during tile work and for 7 days after completion.

B. Where portable heaters are used for temporary heat, vent to outside to avoid carbon dioxide damage to tile work.

PART 2 PRODUCTS

2.01 TILE MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.

   1. Crossville Ceramics Co.

B. Tile Materials: ANSI A137.1; standard grade porcelain tile.

1. CT-1: Crossville "Java Joint" series.
   a. Size: 12 x 24 inch; 3/8 inch thick.
   b. Color: As scheduled.

2. CT-2: Crossville "Color By Numbers" series.
   a. Size: 4 x 8 inch; ¼ inch thick.
   b. Color: As scheduled.

C. Trim Shapes: Size as scheduled; color and finish to match field tile.
   1. Wainscot Cap: Bullnose.
   2. Base: Minimum 4 inch height.
   3. Outside Corners: Bullnose.

2.02 SETTING AND GROUTING MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Bostik Findley; Durabond, Hydroment.
   2. Custom Building Products.
   3. H. B. Fuller Construction Products, Inc.; TEC.
   4. Laticrete International, Inc.
   5. Mapei.
   6. Schlüter Systems, Inc.
   7. W. R. Bonsal Co.

B. Setting Materials:
   1. Wall Tile on Backer Board: ANSI A118.4, latex portland cement mortar.
   2. Floor Tile: ANSI A118.4, latex portland cement mortar.
   3. Sheet Membrane Waterproofing: ANSI A118.10.
   4. Wet-Set Method Mortar Bed, Reinforcing and Cleavage Membrane: ANSI A108.1A.
   5. Crack Isolation Membrane: ANSI A118.12; semi-rigid fabric reinforced sheet, 0.040 inch thick; self-adhering; with compatible primer.

C. Grouting Materials: ANSI A118.6, latex portland cement grout; color as selected.
   1. ANSI A118.19, organic premixed grout may be used where approved by tile manufacturer.

D. Sealer: Clear, water based, penetrating type; water, oil and stain repellent. (Custom Aqua Mix Sealer's Choice Gold)

E. Edge Transition: Extruded aluminum with clear anodized finish and perforated anchoring leg; angled transition from tile thickness to 4 mm. (Schlüter Reno AEU100 for CT-1; AEU80 for CT-2)

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify substrate surfaces are smooth and sound, free of curing membranes, oil, grease, wax, dust and other foreign substances, and within the following tolerances:
   1. Walls: 1/8 inch in 8 ft.
   2. Floors: 1/8 inch in 10 ft.

3.02 PREPARATION:

A. Install waterproof membrane at scheduled locations in accordance with ANSI A108.13.

B. Install crack isolation membrane at scheduled locations in accordance with ANSI A108.17.

3.03 INSTALLATION:

A. Installation Methods:
   1. Wall Tile on Cement Backer Board: ANSI A108.4, TCNA Method W244C.
   2. CT-1 Floor Tile on Concrete Slabs on Grade: ANSI A108.5, TCNA Method F113. Install primer and crack isolation membrane at cracks in floor slab substrate.
   3. CT-2 Floor Tile on Concrete Slabs on Grade: ANSI A108.1A, TCNA Method F121 with sheet membrane waterproofing below mortar bed.
   4. Floor Tile on Elevated Concrete Slabs: ANSI A108.1A, TCNA Method F111 with cleavage membrane.
      a. ANSI A108.5, TCNA Method F113A may be used at Contractor's option provided the mortar and grout products are specifically recommended by the manufacturer for the application. Install primer and full coverage crack isolation membrane to floor slab substrate.

B. Layout:
   1. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each area. Adjust to minimize tile cutting. Provide uniform joint widths.
   2. Extend tile work into recesses and under or behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignment.
   3. Lay out tile work to minimize cuts less than one-half tile in size. Locate tile cuts to be least conspicuous.
   4. Lay out tile wainscots to next full tile, if dimensions shown would require cutting tiles.
   5. Align wall joints to give straight uniform grout lines, plumb and level.
   6. Align floor joints to give straight uniform grout lines, parallel with walls.

C. Patterns: Refer to Drawings for ceramic tile locations and patterns.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, escutcheons, or covers overlap tile.

E. Smooth exposed cut tile edges.

F. Expansion and Control Joints: Provide openings for joints where shown and to comply with details, or, if not shown and detailed, to comply with recommendations in TCNA Handbook. Align joints with joints in substrate, where present.
   1. Provide expansion joints in mortar bed installations, aligned with expansion joints in finished tile work.

G. Apply one coat of sealer at manufacturer's recommended rate, prior to grouting.

H. Grouting:
   1. Grouting Method: ANSI A108.10.
      a. Premixed Grout: ANSI A108.22.
   2. Follow grout manufacturer's recommendations for grouting procedures and precautions.
   3. Remove grout film, observing both tile and grout manufacturers' recommendations as to use of acid and chemical cleaners.
   4. Rinse tile work thoroughly with clean water before and after chemical cleaners.
   5. Polish surface of tile work with soft cloth.

I. Install trim with anchoring leg adhered to substrate. Grout joint between trim and adjacent tile.

3.04 CLEANING:

A. Upon completion of installation and grouting, clean ceramic tile surfaces so they are free of foreign matter.

B. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturers' printed instructions, but not sooner than 14 days after installation.

C. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning.

D. Flush surface with clean water before and after cleaning.

3.05 PROTECTION:

A. Prohibit traffic from newly tiled floors for minimum 3 days, preferably 7 days.

B. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile surfaces.

C. Protect installed tile work with plywood or similar durable covering during construction period to prevent damage and wear.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

E. Apply final coat of sealer after Owner occupancy. Coordinate scheduling to minimize disruption to Owner activities.

F. Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.

END OF SECTION

SECTION 09 5100 – ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Suspended metal grid ceiling system and perimeter trim.
   2. Acoustic panels.

B. Related Requirements:
   1. Section 09 8100 – Acoustic Insulation: Sound control insulation over ceiling panels.
   2. Division 21 – Fire Suppression: Sprinkler heads in ceiling system.
   3. Division 23 – HVAC: Air outlets and inlets in ceiling system.
   4. Division 26 – Electrical: Power outlets and light fixtures in ceiling system.

1.02 SYSTEM DESCRIPTION:

A. Design Requirements for Suspension System: Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1/240 of span.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other work or ceiling finishes, and interrelation of mechanical and electrical items related to system.

B. Product Data: Provide data on metal grid system components, acoustic units, and accessories.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Indicate recommendations for cleaning and refinishing acoustic units, including precautions against materials and methods which may be detrimental to finishes and acoustical performance.

1.05 EXTRA MATERIALS: In accordance with Section 01 7700.

A. Provide 1 percent of total area of extra panels to Owner, for each type of acoustic ceiling panel; in new, unopened, packaging with protective covering for storage, identified with appropriate labels.

1.06 QUALITY ASSURANCE:

A. Conform to CISCA Acoustical Ceilings: Use and Practice.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in installing the Products specified in this section with minimum three years documented experience.

D. Regulatory Requirements: Conform to applicable building code for combustibility requirements for materials.

1.07 PROJECT CONDITIONS:

A. Sequence work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, interior wet work is dry, and overhead work is completed, tested, and approved.

B. Maintain uniform temperature of minimum 55 degrees F and maximum 70 degrees F, and maximum humidity of 75 percent, for minimum 25 hours prior to, during, and 25 hours after acoustic unit installation.

1.08 WARRANTY: In accordance with Section 01 7700.

A. Provide manufacturer's warranty that humidity resistant ceiling panels will be free from sagging or warping for a period of 10 years from Substantial Completion.

PART 2 PRODUCTS

2.01 SUSPENSION SYSTEM MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Armstrong World Industries, Inc.
   2. CertainTeed Corporation.
   3. Rockfon; Chicago Metallic.
   4. USG Interiors, Inc.

B. Exposed Non-fire Rated Steel Grid: ASTM C635, intermediate duty; exposed T; commercial quality cold rolled steel with G30 hot dipped galvanized coating; components die cut and interlocking. (Armstrong Prelude XL; Chicago Metallic 200 Snap Grid System; USG Donn DX)
   1. Exposed Grid Surface Width: 15/16 inch.
   2. Grid Finish: White steel cap.

C. Exposed Non-fire Rated Aluminum Grid: ASTM C635, light duty; exposed T; cold rolled aluminum; components die cut and interlocking. (Armstrong AL Prelude Plus XL; Chicago Metallic 830 System; USG Donn AX)
   1. Exposed Grid Surface Width: 15/16 inch.
   2. Grid Finish: White aluminum cap.

D. Perimeter Trim System: Extruded aluminum; 4 inch flush face profile; factory welded and finished corners; baked enamel finish, white color; with splice plates, T-bar

connection clips and hanging clips as indicated and as required. (Armstrong Axiom; Chicago Metallic Infinity; USG Compässo)

E. Accessories: Stabilizer bars, clips, splices, perimeter moldings, and other accessories required for suspended grid system.

F. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

2.02 ACOUSTIC UNIT MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Armstrong World Industries, Inc.
   2. CertainTeed Corporation.
   3. USG Interiors, Inc.

B. General Requirements: ASTM E1264, Type A, Form 2.2, Pattern G; mineral fiber panels, 1 inch thick; white color, smooth texture; square tegular reveal lay-in edge.
   1. Fire Hazard Classification: ASTM E84, Class A.
      a. Flame Spread Rating: Maximum 25.
      b. Smoke Developed Rating: Maximum 10.
   2. Humidity Resistance: Designed to withstand temperature of 104 degrees F and 90% relative humidity without visible sag.
   3. Durability: Soil resistant; impact and scratch resistant; mold and mildew resistant.

C. Standard Ceiling Panels:
   1. Sizes: As scheduled.
      a. 24 x 24 Inch: Armstrong Calla 2822.
      b. 24 x 48 Inch: Armstrong Calla 2823.
   2. Noise Reduction Coefficient (NRC): ASTM E1264; minimum 0.85.
   3. Suspension System: Exposed non-fire rated steel grid.

D. Scrubbable Ceiling Panels: 24 x 24 inch with acoustically transparent membrane; water repellent; resistant to odor- and stain-producing bacteria. (Armstrong Calla Health Zone 2231)
   1. Noise Reduction Coefficient (NRC): ASTM E1264; minimum 0.80.
   2. Suspension System: Exposed non-fire rated aluminum grid.

2.03 ACCESSORIES:

A. Touch-up Paint: Type and color to match acoustic and grid units.

B. Concealed Hold-Down Clips: Armstrong Universal Hold Down Clip or equal by suspension system manufacturer.

C. Hanger Wire: Steel, minimum 12 gauge.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION OF LAY-IN GRID SUSPENSION SYSTEM:

A. Install suspension system in accordance with ASTM C636 and manufacturer's instructions.

B. Locate system on room axis according to reflected ceiling plan.

C. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

D. Install main runners at 48 inches o.c. at right angles to structural framing, with cross tees at 24 inches o.c. spanning between main runners.

E. Hang suspension system from building structure independent of metal deck, walls, columns, ducts, pipes, and conduit. Install hangers at maximum 48 inches o.c. Provide supplemental steel framing, sized to carry imposed loads, where required to maintain specified hanger spacing.

F. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

I. Do not eccentrically load system, or produce rotation of runners.

J. Perimeter Molding:
   1. Install edge molding at intersection of ceiling and vertical surfaces.
   2. Secure edge molding to substrate with screw anchors through holes provided in vertical leg, at maximum 3 inches from each end and maximum 16 inches o.c.
   3. Use longest practical lengths.
   4. Miter corners to provide hairline joints. Cope exposed flanges of intersecting members, so that faces will be flush.
   5. Provide at junctions with other interruptions.

3.03 INSTALLATION OF ACOUSTIC CEILING PANELS:

A. Install units in accordance with manufacturer's instructions.

B. Fit units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Install units after work above ceiling is complete.

D. Install units level, in uniform plane, and free from twist, warp, and dents.

E. Cut units to fit irregular grid and perimeter edge trim. Cut edges to match factory edge treatment. Field paint exposed edges to match factory edges.

F. Where round or radiused obstructions occur, provide preformed closures to match perimeter molding.

G. Install concealed hold-down clips to retain panels tight to grid system at the following locations:
   1. Within 48 inches of HVAC supply diffusers.
   2. Within 8 feet of vestibule and exterior doors.
   3. Panels containing receptacles and outlets (heavy duty clip required).

3.04 ERECTION TOLERANCES:

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6500 – RESILIENT FLOORING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Luxury vinyl flooring.
   2. Vinyl sheet flooring.
   3. Resilient base.
   4. Resilient stair trim.

B. Related Requirements:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary dehumidification.
   2. Section 03 3000 – Cast-in-place Concrete.
   3. Section 09 3013 – Ceramic Tiling.
   4. Section 09 6800 – Carpeting.
   5. Section 12 3000 – Casework.
   6. Section 14 2023 – Passenger Elevators.

1.02 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Attendance: Flooring Installer, Contractor, Owner, and Architect.

B. Review methods and procedures related to flooring work, including approved submittals, samples, substrate conditions, perimeter transitions, and manufacturer's written instructions.

C. Review schedule and planned sequence of installation; availability of materials and labor; equipment, facilities, and temporary protection.

1.03 SEQUENCING AND SCHEDULING:

A. Install resilient flooring and accessories after other finishing operations (including painting) have been completed.

B. After installation, close areas to traffic and to other work for minimum 72 hours and until flooring is firmly set.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate physical and performance characteristics, and installation instructions.

B. Samples: Submit samples for each product scheduled, showing full range of standard colors and patterns.

1.05 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Maintenance Instructions: Include manufacturer's recommendations for each type of flooring.

B. Extra Tile Materials: Provide one box of each type, color, pattern, and size of tile installed, from same lot as installed materials; in new, unopened, packaging with protective covering for storage, identified with appropriate labels.

1.06 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing the Products specified in this section with minimum three years documented experience; approved by manufacturer.

C. Fire Performance Characteristics: Provide materials whose properties have been determined in accordance with the test methods indicated below, by testing organizations acceptable to regulatory agencies having jurisdiction.
   1. Radiant Panel Test: ASTM E648; Class I.
   2. Smoke Density: ASTM E662; maximum 450 specific optical density.

1.07 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials in original containers, at temperatures between 65 degrees F and 100 degrees F.

B. Protect roll materials from damage by storing on end.

1.08 ENVIRONMENTAL REQUIREMENTS:

A. Maintain the temperature of the space and the materials to be installed at a minimum 65 degrees F and maximum 100 degrees F for minimum 48 hours prior to, during, and 48 hours after installation.

B. Provide temporary ventilation in accordance with Section 01 5000 where required. Where solvent-based adhesives are used, provide safety sparkproof fans; prohibit smoking.

C. After installation, maintain minimum temperature of 55 degrees F in areas where work is complete.

1.09 WARRANTY: In accordance with Section 01 7700.

A. Luxury Vinyl Flooring: Provide manufacturer warranty against wear; minimum 15 years.

B. Sheet Vinyl: Provide manufacturer warranty against wear; minimum 20 years.

PART 2 PRODUCTS

2.01 LUXURY VINYL FLOORING:

A. Manufacturers: In accordance with Section 01 6000.
   1. Interface, Inc.

B. Luxury Vinyl Flooring: ASTM F1700, Class III; 25 x 100 cm, 4.5 mm thick; 0.022 inch wear layer; factory applied polyurethane finish.
   1. Colors and Patterns: As scheduled.

2.02 VINYL SHEET FLOORING:

A. Manufacturers: In accordance with Section 01 6000.
   1. Tarkett North America.

B. Homogeneous Vinyl Sheet: ASTM F1913; nonbacked, nonlayered; 0.080 inch overall nominal thickness.
   1. Nominal Roll Width: 6.5 feet.
   2. Color: As scheduled.

C. Accessories: As recommended by flooring manufacturer.
   1. Vinyl Welding Rod: Solid vinyl bead for heat welding seams; color to match field color.
   2. Concrete Primer: Non-staining type.
   3. Patching Compound: Non-shrink, water resistant Portland cement compound.
   4. Sealer: Compatible with floor finish; verify with Owner.

2.03 RESILIENT BASE AND STAIR TRIM:

A. Manufacturers: In accordance with Section 01 6000.
   1. Nora Systems, Inc.
   2. Tarkett North America; Johnsonite.

B. Vinyl Wall Base: ASTM F1861, Type TV; cove profile; 1/8 inch thick; lengths as long as practicable to minimize joints.
   1. Height: 4 inch.
   2. Colors: As scheduled.

C. Profiled Wall Base: ASTM F1861, Type TP; ¼ inch thick, 4¼ inch height; lengths as long as practicable to minimize joints.
   1. Color and Profile: As scheduled.

D. Stair Trim: ASTM F1344, Type IB, Grade 2; homogeneous rubber with textured surface and patterned color.
   1. Stair Treads: Integral nosing.
   2. Stair Risers: Cove profile.
   3. Landings: 50 x 100 cm tile, 3.5 mm thick.
   4. Color: As selected.

2.04 ACCESSORIES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Flooring or base manufacturer.
   2. Schlüter Systems, Inc.
   3. Tarkett North America; Johnsonite.

B. Floor Transitions and Edge Protection: As recommended by resilient flooring manufacturer.
   1. Resilient Flooring to Exposed Concrete: Rubber for glue down installation; butting gauge as required for flooring material.
   2. Resilient Flooring to Ceramic Tile: As specified in Section 09 3013.
   3. Resilient Flooring to Carpet: Rubber for glue down installation; butting gauge as required to accept approved carpet.

C. Movement Joint for Luxury Vinyl Flooring: Stainless steel with perforated anchoring legs and ¼ inch wide rubber connector, color as selected; height to match flooring. (Schlüter Dilex-EKSB series)

D. Adhesive: Waterproof mastic, as recommended by resilient flooring manufacturer for application and substrate conditions; spray-on adhesives are not permitted.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Test concrete substrate for moisture emission in accordance with ASTM F1869; maximum 3.0 pounds of water per 1000 square feet of slab in a 24 hour period, unless manufacturer recommends more stringent criteria.

B. Verify that substrates are dry, clean, smooth and flat and meet the requirements of ASTM F710. Correct unsatisfactory conditions prior to beginning installation. Proceeding with installation indicates acceptance of substrate conditions.

3.02 PREPARATION:

A. It shall be the full responsibility of the flooring installer to assure a level floor prior to installation of new finish flooring. Install patching compound to fill cracks, holes and depressions and to correct uneven areas in the floor or grind off high spots prior to installation of flooring.
   1. Where thickness greater than 1/8 inch is required, apply patching compound in two or more applications.

B. Remove paints, oils, release agents, waxes, and sealers. Remove curing and hardening compounds not compatible with adhesives.

C. Broom or vacuum clean subfloor prior to installing flooring material.

D. Remove debris, sand, and other materials which would result in lack of adhesion or promote cracking. If these or any other defects occur within 1 year after Substantial Completion, remove the entire flooring at these areas and install new.

3.03 INSTALLATION:

A. Install products in accordance with manufacturer's recommendations.

B. Scribe, cut, and fit resilient flooring to permanent fixtures, built-in furniture and cabinets, pipes, outlets, permanent columns, and walls and partitions.
   1. Scribe, cut, and fit resilient flooring to perimeter of electrical and plumbing items which penetrate through the finish floor, including but not limited to electrical floor outlets, conduit, communications outlets, floor drains, plumbing and gas lines, and related items.

C. Extend resilient flooring into toe spaces, door reveals, and into closets and similar openings.

D. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.

E. Flooring Layout:
   1. Lay units from center marks established with principal walls, discounting minor offsets, so that units at opposite edges of room area are of equal width. Adjust as necessary to avoid use of cut widths less than ½ size at room perimeters. Lay units square to room axis, unless otherwise indicated.
   2. Match units for color and pattern by using units from cartons in same sequence as manufactured and packaged, if so numbered. Cut neatly around fixtures. Broken, cracked, chipped, or deformed units are not acceptable. Lay units with grain running parallel in adjacent units unless otherwise indicated.
   3. Unless specifically indicated, joints need not align at doorways.

F. Sheet Flooring Layout: Lay out flooring to minimize seams. Where seams are required, use the heat welded method in accordance with ASTM F1516 and flooring manufacturer's recommendations. Prepare, weld and finish seams to permanently fuse adjacent sections and produce flush surfaces.

G. Adhesive Application: Apply adhesives following manufacturer's instructions, observing the recommended trowel notching, spread rates and open times. Do not permit the use of reground trowels.
   1. Tightly adhere resilient flooring to substrate without open cracks, voids, raising and puckering at joints, telegraphing of adhesive, spreader marks, or other surface imperfections. Hand roll resilient flooring with minimum 100 pound floor roller to assure adhesion.
   2. Sheet Vinyl: Roll entire sheet area in both directions within one hour after installation.

H. Resilient Base: Apply base to walls, columns, pilasters, casework, and permanent fixtures in rooms or areas where base is scheduled or required. Install base in lengths as long as practicable, with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces. Locate joints minimum 3 feet from corners.

I. Place edge and transition strips where dissimilar flooring materials meet. Butt tightly to flooring and secure with adhesive.

3.04 CLEANING: In accordance with Section 01 7700.

A. Sweep or vacuum floor thoroughly immediately upon completion.

B. Remove excess adhesives from flooring and adjacent surfaces using appropriate cleaner recommended by manufacturer.

C. Do not wash floor until time period recommended by manufacturer has elapsed, to allow resilient flooring to become well sealed in adhesive.

D. Damp mop floor, being careful to remove black marks and excessive soil.

3.05 PROTECTION:

A. Protect flooring against damage during construction period in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09 6800 – CARPETING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Modular carpet.

B. Related Requirements:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary dehumidification.
   2. Section 09 3013 – Ceramic Tiling: Edge trim.
   3. Section 09 6500 – Resilient Flooring: Rubber base, edge and transition strips.
   4. Division 22 – Plumbing: Cover plates recessed for carpet.

1.02 PERFORMANCE REQUIREMENTS:

A. Modular Tile Dimensional Stability: Maximum 0.10 percent.

B. Colorfastness to Crocking: American Association of Textile Chemists and Colorists (AATCC) 165; minimum Class 4 color transfer, wet and dry.

C. Colorfastness to Light: AATCC 16E; minimum Grade 4 color change after exposure of 40 AFU.

D. Electrostatic Propensity: AATCC 134 Step Method; maximum 3.0 Kv.

E. Antimicrobial Activity: AATCC 174; 90% reduction in bacterial growth after 24 hours; no visible fungal activity after 3 days.

F. Flammability:
   1. Methenamine Pill Test: ASTM D2859; pass.
   2. Radiant Panel Test: ASTM E648; Class I.
   3. Smoke Density: ASTM E662; maximum 450 corrected optical density (flaming mode).

G. Indoor Air Quality: Carpet and Rug Institute (CRI) Green Label Plus.

H. Static Coefficient of Friction: Minimum 0.60.

1.03 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Attendance: Flooring Installer, Contractor, Owner, and Architect.

B. Review methods and procedures related to flooring work, including approved submittals, samples, substrate conditions, perimeter transitions, and manufacturer's written instructions.

C. Review schedule and planned sequence of installation; availability of materials and labor; equipment, facilities, and temporary protection.

1.04 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: CRI 104 Section 6; indicate layout, seaming plan, method of joining seams, direction of pile and pattern, and location of edge moldings.

B. Product Data: Indicate physical and performance characteristics, sizes, and method of installation.

C. Samples: Submit complete sets of color swatches for the proposed style and pattern.

D. Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

1.05 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Maintenance Instructions: Include manufacturer's cleaning and spot removal recommendations for each type of carpet.

B. Extra Materials: Provide minimum one case of each style and color, with protective covering for storage, identified with appropriate labels.

1.06 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in installing the Products specified in this section with minimum three years documented experience; manufacturer's authorized dealer or distributor.

1.07 ENVIRONMENTAL REQUIREMENTS:

A. In areas to receive flooring, maintain room temperatures at minimum 70 degrees F for 48 hours prior to, during, and 48 hours following application. Materials shall be conditioned at application temperature and humidity at least 24 hours prior to, during and 48 hours following application.

B. Ventilate installation area during installation and for 3 days after installation.

1.08 WARRANTY: In accordance with Section 01 7700.

A. Provide manufacturer's standard commercial wear warranty, minimum 15 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Interface Americas, Inc.

2.02 MODULAR CARPET:

A. General Requirements:
   1. Yarn: 100% recycled nylon, solution-dyed.
      a. Soil Retardant Treatment: AATCC 189; minimum 350 ppm fluorine on pile fiber of 3 separate tests.

2. Backing: Polymer modified carbon composite. (Interface GlasBac)
3. Color: As scheduled.

B. Style CPT-1: Interface Open Air 402.
1. Construction: Tufted textured loop.
2. Size: 25 x 100 cm.
3. Pile Density: 8143 oz/cu yd.
4. Pile Thickness: ASTM D418; 0.084 inch.
5. Yarn Weight: ASTM D5848; 19 oz/sq yd.
6. Gauge: 1/12.
7. Stitches per Inch: 8.1.

C. Style CPT-2: Interface Open Air 403.
1. Construction: Tufted textured loop.
2. Size: 50 x 50 cm.
3. Pile Density: 8241 oz/cu yd.
4. Pile Thickness: ASTM D418; 0.083 inch.
5. Yarn Weight: ASTM D5848; 19 oz/sq yd.
6. Gauge: 1/12.
7. Stitches per Inch: 8.5.

D. Style CPT-3: Interface Open Air 403 Transitions.
1. Construction: Tufted textured loop.
2. Size: 50 x 50 cm.
3. Pile Density: 6980 oz/cu yd.
4. Pile Thickness: ASTM D418; 0.098 inch.
5. Yarn Weight: ASTM D5848; 19 oz/sq yd.
6. Gauge: 1/12.
7. Stitches per Inch: 9.0.

E. Style CPT-4: Interface Open Air 403 Accent.
1. Construction: Tufted textured loop.
2. Size: 50 x 50 cm.
3. Pile Density: 7600 oz/cu yd.
4. Pile Thickness: ASTM D418; 0.090 inch.
5. Yarn Weight: ASTM D5848; 19 oz/sq yd.
6. Gauge: 1/12.
7. Stitches per Inch: 8.3.

F. Style CPT-5: Interface Third Space 301.
1. Construction: Engaged tufted pattern loop.
2. Size: 50 x 50 cm.
3. Pile Density: 7886 oz/cu yd.
4. Pile Thickness: ASTM D418; 0.105 inch.
5. Yarn Weight: ASTM D5848; 23 oz/sq yd.
6. Gauge: 1/10.
7. Stitches per Inch: 8.0.

G. Style WOF: Interface SR899.
   1. Construction: Tufted textured loop.
   2. Size: 50 x 50 cm.
   3. Pile Density: 6545 oz/cu yd.
   4. Pile Thickness: ASTM D418; 0.143 inch.
   5. Yarn Weight: ASTM D5848; 26 oz/sq yd.
   6. Gauge: 1/12.
   7. Stitches per Inch: 10.0.

2.03 ACCESSORIES:

A. Installation Adhesives and Seam Sealers: As recommended by carpet manufacturer for substrate type; CRI Green Label Plus.

B. Reducer Strips: Refer to Section 09 6500.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Field verify room dimensions at building site before ordering or cutting material.

B. Verify that floor surfaces are smooth and flat, within specified surface tolerances, free from grease or foreign matter, free from concrete dust or powder, and ready to receive work.

C. Verify that concrete floors are aged minimum 60 days and are ready for flooring installation by testing for alkalinity and moisture emission rate in accordance with ASTM F1869. Obtain instructions if test results are not within specified limits.
   1. Moisture Emission Rate: Maximum 3.0 pounds of water per 1000 square feet of slab in a 24 hour period, unless manufacturer recommends more stringent criteria.
   2. Alkalinity: pH range of 5 to 9.

D. Installation of flooring indicates acceptance of substrate conditions including responsibility for defects after installation.

3.02 PREPARATION:

A. Remove subfloor ridges, bumps and high spots. Fill minor or local low spots, cracks, joints, holes and other defects with latex filler.

B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

C. Remove wax or silicone-type curing compounds prior to application of adhesive.

D. Vacuum clean substrate.

3.03 MODULAR CARPET INSTALLATION:

A. Install carpet by experienced carpet layers in an approved manner in accordance with carpet manufacturer's written instructions and CRI 104 Section 14.

B. Verify carpet match to ensure minimal variation between dye lots.

C. Install carpet tight and flat on subfloor, with uniform appearance, using the installation pattern scheduled.

D. Secure anchor rows, and perimeter tiles not adjacent to a wall, with adhesive. Apply pressure sensitive adhesive to substrate uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive. Roll with appropriate roller for complete contact of adhesive to carpet backing.

E. Place adhesive connector tab at each corner of each tile. Align and adhere tiles to tabs.

F. Cut edges straight and true, and seal in accordance with manufacturer's instructions to form permanently non-raveling joints and seams.

G. Trim carpet neatly at walls and around interruptions. Make cuts straight, true, and unfrayed.

H. Install reducer strips at door openings, where floor covering material changes, where carpet edges do not abut a vertical surface, and where indicated on the Drawings.

I. Installer is responsible for the accuracy of measurement and fit.

3.04 CLEANING:

A. Package and label remnants and usable scrap in appropriate wrappings; leave at job site where directed. Remove scraps smaller than 10 square feet and dispose of in a legal manner.

B. Remove excess adhesive without damage from floor, base and wall surfaces.

C. Perform final cleaning in accordance with Section 01 7700. Vacuum flooring thoroughly and leave in clean and acceptable condition, free from spots, dirt or soil, and without tears, frayed or pulled tufts.

3.05 PROTECTION:

A. Protect installed flooring in accordance with Section 01 7000 and CRI 104 Section 16.

B. Do not permit traffic over unprotected floor surface.

C. Apply appropriate protective non-staining building paper covering over finished flooring areas during construction. Immediately prior to Substantial Completion, remove protective coverings and all debris from the site and dispose of in a legal manner.

END OF SECTION

SECTION 09 8100 – ACOUSTIC INSULATION

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Sound control wall and ceiling insulation.
   2. Acoustical sealants.

B. Related Requirements:
   1. Section 07 2100 – Thermal Insulation.
   2. Section 07 8400 – Firestopping.
   3. Section 09 2210 – Metal Support Systems.
   4. Section 09 5100 – Acoustical Ceilings.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Submit product data for each type of insulation product specified, indicating compliance with specified performance characteristics and physical properties.

1.03 QUALITY ASSURANCE:

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

B. Fire Performance Characteristics: Provide insulation materials whose fire performance characteristics have been determined in accordance with the test methods indicated below, by testing organizations acceptable to regulatory agencies having jurisdiction.
   1. Surface Burning Characteristics: ASTM E84.
   2. Fire Resistance Ratings: ASTM E119.
   3. Combustion Characteristics: ASTM E136.

1.04 DELIVERY, STORAGE, AND HANDLING: In accordance with Section 01 6000.

A. Deliver materials in manufacturer's original, unopened, undamaged packaging with identification labels intact. Store materials protected from exposure to harmful conditions.

PART 2 PRODUCTS

2.01 INSULATION MATERIALS:

A. Sprayed Fiber Insulation: ASTM C764, Type I, Category 1, glass fiber, or ASTM C1149, cellulose fiber.

   1. Manufacturers: In accordance with Section 01 6000.
      a. CertainTeed Corporation; Insul-Safe SP.

b. Ark-Seal International, Inc.; Blow-In-Blanket System.
c. International Cellulose Corp.; Celbar.

2. Binder and Adhesive: Manufacturer's standard.

B. Batt Insulation: ASTM C665, Type I, glass fiber batts; unfaced.

1. Manufacturers: In accordance with Section 01 6000.
a. CertainTeed Corporation; NoiseReducer Sound Attenuation Batts.
b. Johns Manville Building Insulation; Formaldehyde-Free Fiberglass Insulation.
c. Knauf Insulation GmbH; EcoBatt.
d. Owens-Corning; Sound Attenuation Batts.

2. Size: 3 to 3½ inch thickness; width as required by framing member spacing; manufacturer's standard lengths.

3. Provide batt insulation where sprayed fiber insulation cannot be installed or where fireblocking is required.

C. Ceiling Grid Insulation: ASTM C665, Type II, Class C; glass fiber batts.

1. Manufacturers: In accordance with Section 01 6000.
a. CertainTeed Corporation; Acoustical Ceiling Batts.
b. Johns Manville Building Insulation; Grid-Shield.
c. Owens-Corning; Sonobatts.

2. Size: 24 x 48 inches to match ceiling panels.

3. Thickness: As indicated on the Drawings.

D. Wall Head Insulation at Metal Deck: As specified in Section 07 8400.

2.02 ACOUSTICAL SEALANT:

A. Manufacturers: In accordance with Section 01 6000.
1. Franklin International; Titebond Professional Acoustical Smoke & Sound Sealant.
2. Hilti, Inc.; CP 506 Smoke and Acoustic Sealant.
3. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
4. USG Corp.; Sheetrock Acoustical Sealant.

B. Acoustical Sealant for Exposed and Concealed Joints: ASTM C834; nonsag, paintable, nonstaining latex sealant intended for sealing interior joints to reduce airborne sound transmission.

PART 3 EXECUTION

3.01 INSTALLATION:

A. General:
1. Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions.

2. Install insulation to comply with thermal and acoustical requirements. Fit insulation to areas and conditions required, without voids.
3. Fit insulation to form a complete insulation barrier around indicated areas. Fit snugly around penetrations.
4. Extend ceiling insulation minimum 48 inches beyond partitions at perimeter of insulated area.
5. Coordinate insulation installation over or within three inches of lighting fixtures, fans, or other heat-generating electrical devices with manufacturer's recommendations and regulations of authorities having jurisdiction.

B. Sprayed Fiber Insulation:
1. Perform installation with pneumatic equipment in accordance with manufacturer's recommendations. Distribute insulation material evenly.
2. Spray-force material into cracks, holes, and seams; seal around electrical boxes, ducts, and plumbing.
3. Provide natural or mechanical ventilation continuously until materials are properly cured.

C. Batt Insulation:
1. Friction fit batts between framing members, installed neatly around and behind electrical boxes, vent piping, duct work, and other obstructions. Butt insulation tight, covering the entire area without voids.
2. Loose lay insulation above suspended ceiling system. Butt pieces together tightly to avoid thermal and acoustical short circuit. Consult ceiling panel manufacturer for information on time-design assemblies and maximum backloading recommendations.
3. Pack loose insulation in narrow spaces where fasteners cannot be installed, to ensure complete insulation coverage.

D. Wall Heads: Friction fit batts or precut strips to fill space between top of wall framing and deck flutes, flush with face of wall. At rated assemblies, coordinate materials and installation with Section 07 8400.

E. Acoustical Sealant: Install acoustical sealant in accordance with ASTM C919; continuous around perimeter of acoustical assembly, between gypsum wall board and floor and ceiling substrate and adjacent wall construction, and between gypsum wall and ceiling boards.

3.02 PROTECTION:

A. Protect installed insulation from harmful weather exposure and physical abuse, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazard.

END OF SECTION

SECTION 09 9000 – PAINTING AND COATING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Exterior and interior painting.

B. Related Requirements:
1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under other sections.
2. Section 05 1200 – Structural Steel Framing.
3. Section 05 2100 – Steel Joist Framing.
4. Section 05 3113 – Steel Floor Decking.
5. Section 05 3123 – Steel Roof Decking.
6. Section 05 5000 – Metal Fabrications.
7. Section 05 5100 – Metal Stairs.
8. Section 05 5133 – Metal Ladders.
9. Section 05 5200 – Metal Railings.
10. Section 06 2000 – Finish Carpentry.
11. Section 07 4646 – Fiber-Cement Siding.
12. Section 07 7233 – Roof Hatches.
13. Section 07 9200 – Joint Sealants.
14. Section 08 1213 – Hollow Metal Frames.
15. Section 08 1400 – Wood Doors.
16. Section 09 2900 – Gypsum Board.
17. Section 09 9623 – Graffiti-Resistant Coatings.
18. Section 10 1453 – Traffic Signage: Sign posts.
19. Divisions 21 to 28: Facility services piping and equipment.
20. Examine the above sections and all other sections of this specification and become familiar with their provisions regarding painting. All surfaces left unfinished by the requirements of other sections shall be painted or finished as part of this work, except as specifically indicated.

1.02 SYSTEM DESCRIPTION:

A. Paint all primed surfaces, and all surfaces not prefinished. The following categories of work are not included as part of field-applied finish work unless specifically indicated:
1. Prefinished and factory finished items, or where installer finishing is specified.
2. Concealed surfaces in generally inaccessible areas.
3. Materials or areas scheduled or indicated as unfinished.
4. Finished metal surfaces, including anodized and fluoropolymer finishes, and non-ferrous metals unless otherwise indicated.
5. Operating parts.
6. Glass.

7. Acoustic ceiling panels and grid.
8. Concrete flatwork.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Do not begin work or deliver products to project site prior to approval of submittals.

B. Product Data: Indicate product characteristics, surface preparation, compatible primers and topcoats, recommended wet and dry film thickness, storage and handling requirements and recommendations, application methods, and cautions. Do not submit Safety Data Sheets.

C. Color Selections: Obtain color schedule from Architect. If proposed manufacturer is different from that identified on color schedule, prepare and submit two samples 6 inches square of each color and sheen required on properly prepared and identified paint-out cards or hardboard.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Include schedule of each product, sheen, color, and location.

1.05 EXTRA MATERIALS: In accordance with Section 01 7700.

A. Provide 1 gallon of each type and color of paint and stain to Owner, in new, unopened, packaging, identified with appropriate labels.

1.06 QUALITY ASSURANCE:

A. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats.

B. Material Quality: Provide best quality grade of specified types of coatings as regularly produced by approved manufacturers. Claims relating to unsuitability of specified products, or inability to produce first-class work with specified products, must be submitted to Architect in writing.

C. Mockup: Prepare job site mockup of each substrate and each paint system specified, using approved products and manufacturer recommended application methods.
1. Obtain Owner's and Architect's acceptance of finish color, texture and pattern and workmanship standard prior to proceeding with remainder of work.
2. Maintain mockup during construction for workmanship comparison. Mockup may be incorporated into final construction upon Owner's approval.

1.07 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Deliver products to the project site in original, unopened containers with all labels intact and legible at time of use.

B. Store materials at minimum ambient temperature of 45 degrees F in well ventilated area. Follow manufacturer's requirements for maximum temperatures.

1.08 ENVIRONMENTAL REQUIREMENTS:

A. VOC Content: ASTM D3960; comply with the most restrictive of the following requirements:
   1. Ozone Transport Commission (OTC) Model Rule.
   2. Applicable federal, state, and local regulations.

B. Protect materials from freezing before, during, and after application.

C. Apply water-based paints only when temperatures of surfaces to be painted and ambient temperatures are between 50 degrees F and 90 degrees F.

D. Apply solvent-thinned paints only when temperature of surfaces to be painted and ambient temperatures are between 45 degrees F and 95 degrees F.

E. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 80%, or to damp or wet surfaces.

F. Apply interior finish painting only when ambient temperature is above 60 degrees F; after painting, maintain ambient temperature above 60 degrees F to prevent condensation.

G. Provide adequate continuous ventilation to maintain humidity below dew point of coldest surface.

PART 2 PRODUCTS

2.01 PAINT AND STAIN MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Sherwin-Williams Co. (abbreviated S-W).
   2. ICI Paints.
   3. Benjamin Moore & Co.
   4. PPG Architectural Finishes, Inc.
   5. Pratt & Lambert.
   6. Tnemec Co., Inc.
   7. Valspar.

B. Provide primers and compatible finish coats by the same manufacturer.

C. Color Pigments: Pure, non-fading, applicable types to suit substrates and applications indicated.

D. Primers:
   1. Industrial Primer:
      a. S-W Pro Industrial DTM Acrylic Primer/Finish (B66W00011).
      b. PPG Pitt-Tech Plus EP Acrylic Primer-Finish (90-1908).

2. Metal Primer:
   a. Aluminum and Galvanized (Gloss Finishes):
      (1) S-W DTM Wash Primer (B71Y00001).
      (2) PPG TrueFinish Commercial Performance Coatings Wash Primer (PLC-900/901).
   b. Aluminum and Galvanized (Other Finishes) and Non-Galvanized Ferrous Metals:
      (1) S-W Pro Industrial Pro-Cryl Universal Primer (B66-1300).
      (2) PPG Pitt-Tech Plus EP Red Primer (90-1908).
3. Wall Primer:
   a. S-W ProMar 200 Interior Latex Primer (B28W8200) or ProMar 200 Zero VOC Interior Latex Primer (B28W02600).
   b. PPG Speedhide Zero Interior Zero VOC Latex Sealer (6-4900XI).
4. Wood Primer:
   a. S-W Premium Wall & Wood Interior Latex Primer (B28W08111).
   b. PPG Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer (17-921).

E. Finish Coats:

1. Acrylic Coatings:
   a. Acrylic Flat Dry Fall Coating:
      (1) S-W Pro Industrial Waterborne Acrylic Dryfall (B42).
      (2) PPG Speedhide Super Tech WB Interior Dry Fog Flat Latex (6-725XI).
   b. Acrylic Latex Semi-Gloss Coating:
      (1) S-W Pro Industrial Acrylic Semi-Gloss (B66-650).
      (2) PPG Pure Performance Interior Semi-Gloss (9-510XI).
   c. Acrylic Gloss Coating:
      (1) S-W Pro Industrial DTM Acrylic Gloss (B66-1050).
      (2) PPG Pitt-Tech Plus EP DTM Acrylic Gloss (90-1510).

2. Alkyd Gloss Enamel:
   a. S-W Waterbased Industrial Enamel (B53-300).
   b. PPG Speedhide Interior/Exterior WB Alkyd Gloss (6-1610XI).

3. Semi-Gloss Epoxy Enamel:
   a. S-W Water Based Catalyzed Epoxy (B70/B60V25).
   b. PPG Pitt-Glaze WB Water-Borne Acrylic Epoxy (16-551).

4. Latex Coatings:
   a. Latex Flat:
      (1) ProMar 200 Zero VOC Interior Latex Flat (B30-2600).
      (2) PPG Speedhide Zero Interior Flat (6-5110).
   b. Latex Eggshell Enamel:
      (1) ProMar 200 Zero VOC Interior Latex Eg-Shel (B20-2600).
      (2) PPG Speedhide Zero Interior Zero VOC Latex Eggshell (6-4310).
   c. Latex Semi-Gloss (Exterior):
      (1) S-W Metalatex Semi-Gloss Coating (B42-100).

(2) PPG Speedhide Exterior 100% Acrylic Latex Semi-Gloss (6-900XI).

d. Latex Semi-Gloss Enamel (Interior):

(1) ProMar 200 Zero VOC Interior Latex Semi-Gloss (B31-2600).

(2) PPG Speedhide Zero Interior Zero VOC Latex Semi-Gloss (6-4510).

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that the work of all other trades is correct and complete so that paint application may properly commence.

B. Verify substrate conditions are acceptable for product application in accordance with manufacturer's instructions.

C. Painting of surface indicates Contractor's acceptance of surface and responsibility for paint failure.

3.02 PREPARATION:

A. Protection:

1. Remove electrical plates, hardware, light fixture trim, fittings, and similar items not scheduled to receive paint, prior to surface preparation or finishing. Mask in place items that cannot be removed.

2. Spot prime exposed metals such as bolts, nails, and welds which are to receive paint. Clean all metal work, smooth and prime if necessary where rusting or scaling occurs.

3. Remove dirt, dust, grease, mildew and other contaminants from all surfaces scheduled to be painted or finished.

B. Surface Preparation: In addition to the following general requirements, follow specific recommendations of the manufacturer for each finish system and substrate application.

1. Interior Wood (Opaque Finish): Repair damaged spots, fill voids and holes with wood putty, and sand completely.

2. Exterior Wood: Finish as soon as possible. Countersink nail heads. Caulk nail heads and joints or cracks with latex caulk. Seal knots and sap streaks. Sand rough areas and wipe clean.

3. Concrete and Masonry: Allow cast-in-place concrete to cure minimum 60 days. Remove laitance by acid etching; apply acid liberally, then rinse thoroughly by scrubbing with fresh water and allow to dry. Sandblast where required to remove form release oil or bond breaker. Remove stains, dirt, loose mortar, scale, salt or alkali powder and other contaminants. Repair cracks, voids, and large voids by repointing, caulking or other approved methods.

4. Steel: Remove mill scale, rust, grease, dirt and dust, by hand scraping, wire brushing, power tool scraping, or sandblasting.
5. Shop Primed Steel: Sand and scrape to remove loose primer and rust. Sand and feather edges to smooth surface. Clean areas with solvent; spot prime bare metal areas.
6. Galvanized Surfaces: Acid etch or clean thoroughly with a grease cutting solvent such as mineral spirits.
7. Aluminum: Remove surface contamination by steam, high pressure detergent wash or solvent washing. Apply acid primer or acid etch. Apply paint immediately following cleaning and etching.
8. Gypsum Board: Verify that surfaces are free of sanding dust, and that joint compound is thoroughly dry. Prime metal corner beads with metal primer before applying latex coatings. Fill minor defects with finishing compound; spot prime.

3.03 PAINT APPLICATION:

A. Apply paint using spray, roller or brush unless otherwise specified or restricted. Method selected must be in accordance with manufacturer's recommendations, suitable for intended surface and finish.

B. Do not open containers until required for use. Stir materials thoroughly and keep at uniform consistency during application.
   1. Mix multiple-component products in accordance with manufacturer's instructions.

C. Apply minimum two finish coats, unless otherwise indicated, in addition to field or shop applied prime coat.
   1. Allow sufficient drying time between coats in accordance with manufacturer's recommendations.
   2. Thinning: In accordance with the manufacturer's recommendations; adhere strictly to manufacturer's recommended spreading rate and dry or wet mil thickness per coat.
   3. Apply each coat to uniform finish without runs, sags, brush or roller marks, skips, ropiness or other defects.
   4. Tint primer and undercoats of paint approximately ½ to ¾ depth of final color.
   5. Sand and dust lightly between coats to achieve smooth finish.
   6. Clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
   7. Back prime concealed wood surfaces with primer prior to installation.
   8. Touch-up suction spots between coats.
   9. Refinish surfaces affected by refitting work.
   10. Apply additional coat wherever there are voids, imperfections or lap marks.

D. Paint exposed steel lintels prior to installation of door, window, storefront, or louver.

E. Seal, prime and finish coat top, bottom and edges of doors prior to door installation, same as door face.
   1. Finish glazing stops to match door face.

F. Exposed Facility Services Equipment: Paint same color as used on walls or ceilings of room. Do not paint equipment or materials in unfinished areas.
   1. Remove and paint separately from adjacent surfaces all unfinished grilles, louvers, access panels, and covers.
   2. Prime and paint exposed pipes, ducts, covers, conduit, boxes, hangers, brackets and collars, including insulated items, except where items are plated or prefinished.
   3. Paint front, back and edges of plywood backboards for electrical and communications equipment before installing equipment.
   4. Paint dampers and baffles behind grilles or in convectors to match face panels. Paint visible surfaces of ducts behind air outlets and inlets flat black.
   5. Do not paint over name plates or joints in moving parts of equipment.

G. Where walls with fire or smoke requirements are indicated on Drawings, apply the legend "LIFE SAFETY ASSEMBLY – PROTECT ALL OPENINGS" at maximum 15 foot horizontal spacing on both sides of the wall approximately one foot above finish ceiling, using 3 inch high red stenciled letters or preprinted decals. Verify location, spacing, size, wording, color, and method of application with authorities having jurisdiction.

3.04 TOUCH-UP:

A. Do all touch-up work that may be required throughout the project.

B. Apply materials in accordance with manufacturer's recommendations for adequate coverage, waterproofing, and weather resistance. If the specified number of coats do not achieve adequate coverage, waterproofing, and weather resistance, apply additional coats at no additional cost until acceptable performance and finish are obtained.

3.05 CLEANING:

A. Perform progress cleaning in accordance with Section 01 7000. Remove discarded paint materials, rubbish, cans, and soiled or used rags from the project site at the end of each work day. Use every precaution to avoid the danger of fire.

B. At completion of painting work, remove surplus paint materials and debris from the project site, and leave work areas in a clean and finished condition.

C. Perform final cleaning in accordance with Section 01 7700. Clean window glass and other paint-spattered surfaces. Remove spattered paint by approved methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.06 PROTECTION:

A. Protect surfaces and objects inside and outside the building, including lawns, shrubbery, and adjacent properties against damage; repair damage to adjacent surfaces.

B. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct damage by cleaning, repairing, or replacing as required to match existing.

C. Exercise care and provide protection for adjacent prefinished or unfinished items, moving parts or assemblies, sprinkler heads, valves, motors, machinery, and related items. Provide all required covering, masking tape, and other protective materials.

D. Provide "wet paint" signs as required to protect newly painted finishes.

E. Following completion of painting in each area, promptly reinstall all items removed for protection.

F. After completion of painting operations, remove temporary protective materials, including those provided by others for protection of their work.

3.07 SCHEDULE:

A. Items scheduled herein to be painted are not intended to be all inclusive and are listed only as a guide to material type and exposure. Additional items indicated on the Drawings or in the Specifications shall receive applicable finishes, unless otherwise noted.

B. Exterior Metals: Exposed structural and miscellaneous galvanized and non-galvanized ferrous metal and aluminum items; lintels, guard posts, roof hatches, hollow metal doors and frames, facility services piping including exposed gas piping, vents, flues, stacks, conduit, electrical boxes, and related items.

1. Factory Primed Surfaces: Clean, sand, and touch-up with compatible primer wherever necessary before applying finish coats.

2. Unprimed Non-Galvanized Ferrous Metal Surfaces: Apply one coat industrial primer (6.0 mils wet, 3.0 mils dry).

3. Apply two finish coats acrylic gloss coating (8.0 mils wet, 3.0 mils dry per coat).

C. Exterior Fiber-Cement Siding: Apply two finish coats latex semi-gloss coating (6.0 mils wet, 2.2 mils dry per coat).

D. Interior Metals: Clean, sand, and touch-up factory primed surfaces with compatible primer wherever necessary before applying finish coats.

1. Structural Components: Metal deck, structural framing, joists, and related items.
   a. Apply one coat industrial primer (5.0 mils wet, 2.5 mils dry).
   b. Apply two finish coats latex flat wall paint (4.0 mils wet, 1.4 mils dry per coat) or acrylic flat dry fall coating (7.0 mils wet, 3.0 mils dry per coat).

2. General Building Components: Lintels, railings, columns, hollow metal doors and frames including removable mullions, and related items.
   a. Apply one coat metal primer (5.0 mils wet, 2.0 mils dry).

b. Apply two finish coats acrylic latex semi-gloss coating (6.0 mils wet, 2.1 mils dry per coat).

3. Facility Services Components: Sheet metal duct work, exposed piping, electrical panel covers, and related items.
   a. Apply one coat metal primer (7.5 mils wet, 3.0 mils dry).
   b. Apply two finish coats alkyd gloss enamel (4.5 mils wet, 1.6 mils dry per coat).

E. Interior Wood (Opaque Finish):

1. Apply one coat wood primer (4.0 mils wet, 1.8 mils dry).
2. After thoroughly drying, sand lightly before applying finish coats.
3. Apply two finish coats latex semi-gloss enamel (4.0 mils wet, 1.3 mils dry per coat).

F. Interior Gypsum Board and Cement Board:

1. Toilet Rooms and Shower Rooms:
   a. Apply one coat wall primer (4.0 mils wet, 1.2 mils dry).
   b. Apply two finish coats semi-gloss epoxy enamel (6.5 mils wet, 2.5 mils dry per coat).
2. Other Locations:
   a. Apply one coat wall primer (4.0 mils wet, 1.1 mils dry).
   b. Apply two finish coats latex eggshell enamel (4.0 mils wet, 1.6 mils dry per coat).

END OF SECTION

SECTION 09 9623 – GRAFFITI-RESISTANT COATINGS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Water repellent and graffiti-resistant treatment for exterior masonry.

B. Related Requirements:
   1. Section 04 7200 – Cast Stone Masonry.

1.01 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Include application procedures.

1.02 QUALITY ASSURANCE:

A. Applicator Qualifications: Company specializing in performing the Work of this section with minimum 5 years documented experience.

B. Mockup: Apply coating to 4 x 4 ft panel of wall; locate as directed. Allow panel to dry three to seven days before inspection.
   1. Verify compatibility of coating with substrate.
   2. Test for water resistance and graffiti resistance.
   3. Acceptable panels will become the standard for work of this Section. Protect panels in undisturbed condition until completion of the work.

1.02 DELIVERY, STORAGE AND HANDLING: In accordance with Section 01 6000.

A. Store materials between 45 and 100 degrees F, and under conditions and for a period of time not longer than that recommended by manufacturer.

1.03 FIELD CONDITIONS:

A. Apply coatings when surface and air temperatures are between 40 and 90 degrees F for eight hours. Protect from freezing and evaporation.

1.04 WARRANTY: In accordance with Section 01 7700.

A. Provide manufacturer warranty that coating will repel liquid water and remain water vapor permeable for 10 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. ProSoCo, Inc.

2.02 MATERIALS:

A. Graffiti-Resistant Coating: Clear-drying, penetrating, water-based silicone emulsion to protect masonry from repeated graffiti attack without altering natural appearance. (Sure Klean Weather Seal Blok-Guard & Graffiti Control WB15)

   1. Performance Requirements:
      a. Total Solids: ASTM D2369; minimum 15 percent.
      b. Water Absorption Reduction for Brick: ASTM C67; minimum 99 percent.
      c. Water Absorption Reduction for CMU: ASTM C140; minimum 92 percent.
      d. Water Vapor Transmission: ASTM D6490; minimum 97 percent.
      e. Cleanability: ASTM D7089; Level 2.

B. Graffiti Removers: Compatible with graffiti-resistant coating.
   1. Enviro Klean SafStrip.
   2. Enviro Klean SafStrip 8.
   3. Sure Klean Graffiti Remover.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify surfaces are clean, dry, free of efflorescence, oil, grease, or other foreign matter.

B. Verify joint sealants have been allowed to cure for minimum 24 hours or as recommended by sealant manufacturer.

C. Verify masonry surfaces have been allowed to cure for minimum 28 days and are undamaged.

3.02 PREPARATION:

A. Remove loose particles and foreign matter. Remove grease or oil with a solvent, effective alkaline cleaner, or detergent; allow to dry.

B. Protect surrounding areas, vehicles, plants, and property from product, splash, residue, fumes, and wind drift. Mask windows, polished stone, metal, and non-masonry surfaces with polyethylene or protect from contact with materials using other approved techniques.

C. Close windows, outside air intakes, and vents. Shut down air handling equipment during application and until vapors have dissipated.

3.03 INSTALLATION:

A. Apply coating in accordance with manufacturer's instructions, at recommended coverage rate for the substrate.

B. Use low pressure (less than 50 psi) spray equipment, with roller or brush application at small areas not suitable for spray.

C. Apply a saturated wet-on-wet coat from bottom to top, and from one end of area to the other without excessive overlapping. Apply enough material for 6 to 8 inches of rundown below the contact point. Allow coating to penetrate for 2 to 3 minutes before brushing out runs and drips.

D. Textured and Porous Surfaces: Apply second wet-on-wet coat when first application is dry to the touch, within one hour. Backroll or brush out runs and drips for uniform appearance.

3.04 CLEANING:

A. If applied to unscheduled surfaces, remove immediately using manufacturer's approved method.

B. Clean tools, equipment, and overspray with soap and warm water.

3.05 PROTECTION:

A. Protect treated surfaces from rain within 6 hours of application.

END OF SECTION

SECTION 10 1402 – INTERIOR SIGNAGE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Interior signs.

B. Related Requirements:
   1. Section 01 1117 – Owner-Supplied Products.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Illustrate graphics and copy of each style of signage; indicate mounting provisions, installation details and accessories.

B. Samples: Submit full range of colors for selection.

1.03 REGULATORY REQUIREMENTS:

A. Comply with provisions of ADA.

PART 2 PRODUCTS

2.01 INTERIOR SIGNS:

A. Wall Mounted Signs: Clear acrylic with raised graphics and copy; beveled edges; colored backplate; grade 2 Braille.
   1. Graphics: International universal style symbols.
   2. Copy: Medium sans-serif typestyle, minimum 5/8 inch high.
   3. Colors: As selected.
   4. Mounting: Secure backplate to wall using screws and plastic expansion anchors.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install signs after mounting surfaces are finished.

B. Install products in approved locations in accordance with manufacturer's instructions, level and plumb, and rigidly attached to anchoring surfaces.

C. Mounting Locations and Heights: In accordance with ADA. Adjacent to latch side of door or edge of opening, 9 inches from edge of door to center of sign; 60 inches above finish floor to top of sign. Do not mount signs on doors unless specifically approved
   1. For pairs of doors with one active leaf, mount sign on inactive leaf, 10 inches from latch edge of active leaf to center of sign.
   2. For pairs of doors with two active leaves, mount sign 10 inches from hinge edge of right hand door to center of sign.

3.02 SCHEDULE:

A. Provide signage as scheduled at each of the following locations, whether or not specifically indicated on the Drawings.

1. Unisex Toilet Rooms, Accessible: Wall mounted sign, 8 x 8 inch; “Restroom”; with international symbol of accessibility, international male symbol and international female symbol.

2. Unisex Toilet Rooms, Not Accessible: Wall mounted sign, 8 x 8 inch; “Restroom”; with international male symbol and international female symbol.

3. Elevator Entrances: Wall mounted sign, 8 x 8 inch; “In Case of Fire/Do Not Use Elevators/Use Stairs”; red fire symbol; white copy and stair symbol.

4. Stair Entrances: Wall mounted sign, 8 x 8 inch; “Stairway”; with stair symbol.

5. Sprinkler System Riser Rooms: Wall mounted sign, dimensions as required, “Sprinkler Riser”; 2 inch high letters with 3/8 inch stroke width and character spacing.

6. Entrance Doors: “No Smoking” sign with telephone number for reporting violations, with red and black no smoking symbol and black text on white background; format in accordance with sample signs posted at odh.ohio.gov/wps/portal/gov/odh/know-our-programs/smoke-free-workplace-program/resources/Smoke Free Workplace Signs, or similar layout meeting the requirements of Ohio Department of Health.
   a. Doors With Glazing: Vinyl graphics, minimum 4 x 6 inch; applied to upper corner of door glazing on latch side of door.
   b. Signage is not required at doors designated for exit only. At pairs or sets of doors, provide signage at one door only.

7. Occupant Loads: Wall mounted sign, 12 x 4 inch; “Maximum Occupancy ___” with occupant load of room or space. Provide sign for each room with Assembly use noted on Life Safety Plan.

END OF SECTION

SECTION 10 1453 – TRAFFIC SIGNAGE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Post mounted metal signs.

B. Related Requirements:
   1. Section 03 3000 – Cast-In-Place Concrete: Placement of metal fabrications in concrete.
   2. Section 09 9000 – Painting and Coating.

1.02 REGULATORY REQUIREMENTS:

A. Comply with provisions of ADA, ODOT Manual of Uniform Traffic Control Devices (MUTCD), and ODOT Sign Designs and Markings Manual (SDMM).

PART 2 PRODUCTS

2.01 MATERIALS:

A. Steel Sections: ASTM A36 or ASTM A572, Grade 50.

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

C. Welding Electrodes: E70XX.

D. Surfaces to be Galvanized: Apply galvanized coating after fabrication to ASTM A123, minimum 1.25 oz/sq ft.
   1. Touch-Up Primer for Galvanized Surfaces: SSPC 20.

E. All materials shall be new and free from rust.

2.02 POST MOUNTED METAL SIGNS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Best Manufacturing Co.
   2. Grimco, Inc.
   3. Safety Sign Co.
   4. Seton Name Plate Co.

B. Reflective Sign Materials: 0.080 inch aluminum; baked enamel finish with screen printed graphics and copy on reflective vinyl sheeting.

C. Graphics: International universal style symbols.

D. Fasteners: Cadmium plated steel, 3/8 inch diameter bolts with nuts and washers as required.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install products in approved locations in accordance with manufacturer's instructions, level and plumb, and rigidly attached to anchoring surfaces.

B. Field weld components indicated on shop drawings.

C. Perform field welding in accordance with AWS D1.1.

D. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.02 METAL FABRICATIONS SCHEDULE:

A. Steel Sign Posts: As detailed; galvanized steel channel, 10 foot minimum length; flush watertight top cap.

3.03 TRAFFIC SIGN SCHEDULE:

A. Parking Control Signs: Post mounted reflective metal signs, in accordance with MUTCD and SDMM.

1. Accessible Parking: R7-8, 12 x 18 inch; mounting height 60 inches above parking surface to bottom of sign.
   a. Accessible Parking Fine: R7-H8bP, 12 x 6 inch, mounted directly below R7-8.
   b. Van Accessible Parking: R7-8P, 12 x 6 inch, mounted below R7-H8bP.

END OF SECTION

SECTION 10 2239 – FOLDING PANEL PARTITIONS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Acoustical operable panel partitions.

B. Related Requirements:
   1. Section 05 1200 – Structural Steel Framing.

1.02 PERFORMANCE REQUIREMENTS:

A. Acoustical Performance: ASTM E90; minimum STC 50 as tested by independent acoustical laboratory.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate opening dimensions, panel layout, stacking depth and configuration, clearances, weights, structural attachment, and deflection limitations.

B. Samples: Indicate full range of standard colors and patterns.

1.04 QUALITY ASSURANCE:

A. Installer Qualifications: Authorized by partition manufacturer.

PART 2 PRODUCTS

2.01 OPERABLE PANEL PARTITIONS:

A. Manufacturer: In accordance with Section 01 6000.
   1. Modernfold, Inc.; Acousti-Seal 930 series.
   2. Kwik-Wall Co.; Hufcor 600 series.
   3. Panelfold, Inc.; Moduflex 400 series.

B. Panel Description: Paired panels; top supported; manual operation; non-fire rated.

C. Panel Construction: Formed steel horizontal and vertical frame, unitized with overlapped and welded corners, configured to conceal edges of panel skin; panel skin continuously bonded to frame.
   1. Panel Size:
      a. Thickness: Maximum 4 inch.
      b. Width: Maximum 48 inches per panel.
      c. Height: As scheduled.
   2. Panel Skin: ½ inch gypsum board.
   3. Hinges: Full leaf butt type, attached directly to panel frame; with welded hinge anchor plates within panel.

D. Outer Covering: Reinforced vinyl with woven fiber backing, 15 oz/sq yd.
   1. Flame Spread Rating: ASTM E84; Class A.
   2. Color: As selected.

E. Weight: Maximum 10.5 lb/sq ft.

F. Suspension System: Continuous formed metal track, suspended from building structure with adjustable steel hanger brackets and threaded rods; integral ceiling soffit with prime painted finish; panel guide. Panel frame supported from track by ball bearing trolley assemblies with steel wheels.

G. Sound Seals:
   1. Panel Edge Seals: Steel panel edges with vertical interlocking acoustical astragal seals in each panel edge; reversible tongue and groove configuration.
   2. Top Seals: Extruded vinyl sweeps for continuous low friction contact with no mechanically operated parts.
   3. Bottom Seals: Manually activated operable seals with nominal 2 inch operating clearance; operable from either panel edge to permit multiple panel positioning and reversible operation.
   4. End Closure: Expandable panel jamb.

H. Marker Boards: Size as indicated; porcelain enamel steel bonded to face of panel; concealed mounting.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that opening is prepared to proper dimensions, plumb, and level.

B. Verify permanent HVAC systems are properly operating and building temperature and humidity have stabilized.

3.02 INSTALLATION:

A. Install partitions in accordance with manufacturer's instructions.

B. Verify secure attachment of partition to track, and track to supporting structure.

C. Adjust partition for smooth operation throughout range of travel.

END OF SECTION

SECTION 10 2800 – TOILET AND BATH ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Toilet room accessories.

B. Related Requirements:
   1. Section 06 1050 – Miscellaneous Rough Carpentry: Wall backing required to secure accessories.
   2. Division 22 – Plumbing: Fixtures and fittings.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Manufacturer's data sheets, accessories schedule, and installation instructions.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Submit service and parts manuals; keys; warranty documents; and name of local field service representative.

1.04 QUALITY ASSURANCE:

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years experience.

B. Regulatory Requirements: Operating features of accessories shall comply with ADA.

1.05 WARRANTY: In accordance with Section 01 7700.

A. Mirrors: Provide 15 year warranty against silver spoilage.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Bobrick Washroom Equipment, Inc.

B. American Accessories, Inc.

C. American Specialties, Inc.

D. Bradley Corporation.

2.02 MATERIALS:

A. General: Shop assembled, free of dents or 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 using seamless sheets, with flat surfaces.

B. Stainless Steel: ASTM A167, Type 304; No. 4 satin brushed finish; 22 gauge minimum thickness.

C. Mirror Glass: ASTM C1503.

D. Fasteners, Screws and Bolts: ASTM A153, hot dip galvanized.

E. Chrome Plating: ASTM B456.

F. Keys: Accessories with locks shall be keyed alike, with the exception of coin boxes in vending equipment. Provide six keys to Owner.

G. Locks: Tumbler locks shall be fastened to accessories with lock nuts; spring clips are not acceptable.

2.03 TOILET ROOM ACCESSORIES:

A. Mirrors with Shelves: No. 1 quality plate glass, sizes as scheduled; electrolytically copper plated, with one piece roll formed stainless steel channel frame; with 6 inch deep stainless steel shelf; with galvanized steel wall hanger for concealed mounting.

B. Soap Dispensers: Container body and back of stainless steel; corrosion resistant dispensing valve; 40 fl. oz. capacity, concealed wall fastening, hinged locking stainless steel filler top, vandal resistant.

C. Side-By-Side Toilet Paper Holders: Two roll capacity; surface mounted stainless steel cabinet; door with flush tumbler lock; stainless steel spindles.

D. Napkin Disposals: Surface mounted; stainless steel; door with full length piano hinge and international graphic symbol; 1.3 gallon capacity.

E. Napkin and Tampon Vending Units: Semi-recessed stainless steel cabinet with adjustable face flange; door with full length piano hinge and tumbler lock; fully welded cabinet body. Single coin operation with barrier free pushbutton or handle; coin collection boxes keyed differently from cabinet door. Capacity for minimum 17 napkins and 26 tampons, identified without brand name advertising.

F. Folded Towel Dispensers: Surface mounted stainless steel cabinet; door with full length piano hinge; capacity of 400 C-fold or 525 multi-fold paper towels without adapters; tumbler lock.

G. Grab Bars (General Locations): 18 gauge stainless steel, 1½ inch diameter; 1½ inch clearance between wall surface and inside face of bar; concealed stainless steel

mounting flanges with snap-on covers; lengths as indicated. (Bobrick B-6806 series; Bradley 812 series; ASI 3800 series)

H. Grab Bars (Shower Locations): 18 gauge stainless steel, 1½ inch diameter; non-slip finish; 1½ inch clearance between wall surface and inside face of bar; concealed stainless steel mounting flanges with snap-on covers; lengths as indicated.

I. Folding Rectangular Shower Seats: Wall mounted surface type; welded tubular seat frame, structural support members, hinges and mechanical fasteners of stainless steel; rectangular seat, ½ inch thick solid phenolic laminate, secured to supporting frame members with stainless steel screws.

J. Shower Curtains: Opaque vinyl or nylon reinforced vinyl fabric, 0.008 inch thick, with antibacterial treatment; flameproof and stain-resistant.
   1. Shower Curtain Rods: 18 gauge stainless steel tube, 1¼ inch outside diameter, satin finish; stainless steel mounting flanges; with curtain hooks.

K. Coat Hooks: Heavy duty stainless steel, single pin; satin finish; square bracket and backplate for concealed mounting, with locking set screw.
   1. Verify projection with adjacent door and wall clearances.

L. Robe Hooks: Stainless steel double bar hook; rectangular bracket and backplate for concealed mounting, with locking set screw.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify wall construction for proper dimensions and conditions affecting installation. For surface mounted accessories, check condition of wall and confirm installation of backing materials within wall.

B. Verify spacing and clearances of plumbing fixtures and adjacent construction affecting installation of accessories.

3.02 INSTALLATION:

A. Install accessories in accordance with manufacturer's installation instructions, plumb and level, securely and rigidly attached to substrate.

B. Install accessories at locations and heights indicated, and as required to comply with ADA and applicable building codes.

C. Install items using non-corrosive anchoring devices.

D. Conceal evidence of drilling, cutting, and fitting to room finish.

E. Fit flanges of accessories snugly to wall surfaces.

3.03 ADJUSTING:

A. Adjust accessories for proper operation. Test mechanisms, hinges, and latches; adjust and lubricate where necessary.

3.04 CLEANING: In accordance with Section 01 7700.

A. Remove protective coatings and paper covers.

B. Clean and polish exposed surfaces.

END OF SECTION

SECTION 10 4400 – FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Fire extinguisher cabinets.
   2. Fire extinguishers.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Indicate dimensions, certifications, and mounting details.

PART 2 PRODUCTS

2.01 FIRE EXTINGUISHERS AND CABINETS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Amerex.
   2. Activar Construction Products Group, Inc.; JL Industries.
   3. Johnson Controls; Ansul.
   4. Larsen's Manufacturing Company.
   5. Smith Industries, Inc.; Potter-Roemer.

B. Fire Extinguishers: NFPA 10, UL rated, FM approved; 10 lb., 4A-60BC type, pressurized multi-purpose dry chemical extinguisher; with pressure gauge and hose.
   1. Provide mounting brackets and fasteners for wall mounted extinguishers.

C. Semi-Recessed Cabinets: Sheet steel interior, minimum 18 gauge; white baked enamel finish; 2½ to 3 inch projection from face of wall, with rolled edge trim. (JL Academy 1027; Larsen's 2409-6R)
   1. Door and Frame: Aluminum with satin anodized finish; pull handle with friction catch; full glazed door with clear acrylic window, ¼ inch thick. (JL F10 series)

D. Provide fire rated cabinets where recessed in fire rated assembly.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install Products in accordance with manufacturer's instructions and requirements of governing authorities.

B. Prepare wall recesses as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.

C. Securely fasten mounting brackets and cabinets to structure, square and plumb.

D. Mounting Height:
   1. Wall Mounted Extinguishers: 54 inches above finish floor to top of extinguisher.
   2. Fire Extinguisher Cabinets: Maximum 56 inches above finish floor to top of cabinet.

E. Check extinguishers for proper charge operation. Remove and replace damaged, defective or undercharged units prior to substantial completion.

F. Tag extinguishers; indicate expiration date of charge.

END OF SECTION

SECTION 11 3100 – APPLIANCES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Refrigeration appliances.
   2. Microwave ovens.
   3. Dishwashers.

B. Related Requirements:
   1. Section 12 3000 – Casework: Cabinets and countertops.
   2. Division 22 – Plumbing: Water supply and drain connections to equipment.
   3. Division 26 – Electrical: Power wiring and final connections.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Product Data: Unit dimensions, rough-in dimensions, utility requirements and installation instructions.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Operation and Maintenance Data: Provide operating instructions and maintenance instructions for each piece of equipment. Include list of service agents and their telephone numbers for each piece of equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. GE Appliances.

B. U-Line Corporation.

2.02 REFRIGERATION APPLIANCES:

A. Refrigerators (Break Room 141): Energy Star labeled; 36 inch nominal width; 22 cubic foot total capacity; bottom mount freezer section with interior lighting and 2 storage baskets; double upper doors with 6 door bins; 5 adjustable glass shelves; 2 adjustable humidity produce crispers; dairy compartment; water filter; automatic icemaker; ice and water dispenser in door; external digital temperature display; stainless steel cabinet. (GE PYE22KYNFS)

B. Refrigerators (Break Room 261): Energy Star labeled; 30 inch nominal width; 21 cubic foot total capacity; bottom mount freezer section with interior lighting and 2 storage baskets; double upper doors with 8 door bins; 3 adjustable glass shelves; 2 adjustable humidity produce crispers; dairy compartment; water filter; automatic icemaker; internal digital temperature display; stainless steel cabinet. (GE GNE21FYKFS)

C. Undercounter Refrigerators: Sized for installation below 34 inch high countertop; minimum 5.3 cubic foot refrigerator capacity; automatic defrost; 4 chrome wire shelves; black vinyl clad textured steel cabinet. (U-Line ADA24RB)

2.03 ELECTRIC COOKING APPLIANCES:

A. Microwave Ovens: 2.2 cu. ft. capacity, black cabinet; turntable, electronic touch controls with digital display and clock/timer; sensor cooking controls with probe; 1200 watts with 10 power levels. (GE PCWK22U1WBB)

2.04 DISHWASHERS:

A. Dishwashers: Energy Star labeled; sized for installation below 34 inch high countertop; black steel cabinet; stainless steel interior; front mounted electronic controls. (GE GDT225SGLBB)

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that cabinet and countertop openings are correctly sized and located.

B. Verify that utility rough-in work is complete and correctly located.

3.02 INSTALLATION:

A. Install appliances in accordance with manufacturer's instructions.

B. Coordinate utility connections with the work of other Sections.

C. Verify proper operation of appliance units and operating features.

3.03 CLEANING:

A. Perform final cleaning of interior and exposed exterior surfaces in accordance with Section 01 7700.

END OF SECTION

SECTION 12 2400 – WINDOW SHADES

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Roller window shades.

B. Related Requirements:
   1. Section 06 1050 – Miscellaneous Rough Carpentry.
   2. Section 08 4113 – Aluminum Entrances and Storefronts.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate plans, elevations, sections, installation details, operational clearances, and relationship to adjacent work. Identify spaces and openings with the room, door, and window numbers used on the Drawings.

B. Product Data: Indicate product information, styles, profiles, and features; fire resistance data, flame spread and smoke contribution.

C. Samples: Submit color samples for selection.

1.03 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Project Record Documents: Include operation and maintenance instructions.

1.04 QUALITY ASSURANCE:

A. Flammability: NFPA 701; small- and large-scale vertical burn.

PART 2 PRODUCTS

2.01 ROLLER WINDOW SHADES:

A. Manufacturers: In accordance with Section 01 6000.
   1. Basis of Design: MechoShade Systems, LLC; Mecho/5x.
   2. Draper, Inc.; Manual FlexShade.
   3. Springs Window Fashions; SWFcontract.

B. Fabric: PVC and polyester yarns woven in 2x2 basketweave pattern; 3 percent open; fire retardant; bacterial and fungal resistant. (Mecho Soho 1600)
   1. Color: As selected.
   2. Weight: 13.5 oz/sq yd.

C. Bottom Slat: Aluminum; enclosed in fabric hem.

D. Sizes: As required to suit window openings.

E. Fascia: Extruded aluminum with dark bronze anodized finish, for surface mounting without exposed fasteners.

F. Operating System: Stainless steel bead chain with up and down stops; extruded aluminum roller tube and clutch sized for fabric weight and opening size.

G. Accessories: Mounting brackets, fittings, and hardware; as required.

H. Fabrication: Where opening width exceeds dimensional limitations, locate joints at center of window mullions; butt rollers end to end.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Field verify opening sizes prior to beginning fabrication.

B. Verify room painting and finishing operations are complete prior to installation.

3.02 INSTALLATION:

A. Install window shades in accordance with manufacturer's instructions; securely attached, plumb and level, located in correct position relative to window units.

B. Adjust operating hardware for smooth operation.

END OF SECTION

SECTION 12 3000 – CASEWORK

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Factory fabricated casework.
   2. Cabinet hardware.
   3. Prefinished surfaces.
   4. Preparation for installing utilities.

B. Related Requirements:
   1. Section 06 1050 – Miscellaneous Rough Carpentry: Wall blocking for attachment of components.
   2. Section 06 6116 – Solid Surfacing Fabrications: Countertops.
   3. Section 09 6500 – Resilient Flooring: Base for installation in toe kick space.
   4. Section 11 3100 – Appliances.
   5. Division 22 – Plumbing.
   6. Division 26 – Electrical.

1.02 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate materials, component profiles and elevations, required field dimensions, assembly methods, joint details, fastening methods, accessory listings, hardware locations, utility connections, required blocking and supports, and schedule of finishes.

B. Product Data:
   1. Provide data for hardware accessories.

C. Samples:
   1. Submit two samples illustrating cabinet finish.
   2. Submit two samples of pulls and hinges, illustrating hardware finish.

1.03 QUALITY ASSURANCE:

A. Perform Work in accordance with AWI 0641 Custom grade.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Regulatory Requirements: Components indicated to be accessible shall comply with ADA.

D. In lieu of grade stamping exposed to view materials, submit manufacturer's certificate certifying that products meet or exceed specified requirements.

1.04 ENVIRONMENTAL REQUIREMENTS: In accordance with Section 01 6000.

A. Protect units from moisture damage.

B. During and after delivery of materials and installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

PART 2 PRODUCTS

2.01 WOOD MATERIALS:

A. Softwood Plywood: DOC PS 1; graded in accordance with AWI; veneer core.
   1. Plywood Scheduled to Receive Opaque (Painted) Finish: APA A-B, Group 1, type of glue recommended for application, rotary cut Douglas Fir face species.
   2. Plywood Scheduled to Receive Laminate Finish: APA B-B, Group 2, type of glue recommended for application, rotary cut Douglas Fir face species.

B. Wood Particleboard Scheduled to Receive Laminate Finish: ANSI A208.1, Grade M-2, medium density (45 lbs per cu ft), Industrial grade; composed of wood chips, made with high waterproof resin binders; sanded faces.

2.02 LAMINATE MATERIALS:

A. Manufacturers: In accordance with Section 01 6000.
   1. Formica Corporation.
   2. International Paper Decorative Products; Nevamar.
   3. Pioneer Plastics Corporation, Pionite.
   4. Wilsonart International, Inc.

B. Plastic Laminate: NEMA LD3; color, pattern, and surface texture as scheduled.
   1. Grade HGS, 0.050 inch thick, for horizontal surfaces, high usage locations, and cabinet exteriors.
   2. Grade VGS, 0.028 inch thick, for vertical surfaces.
   3. Grade HGP, 0.039 inch thick, for forming radius edges and backsplashes.
   4. General Purpose type, 0.020 inch thick, for thermally fused melamine surfaces.
   5. Cabinet Liner type, 0.020 inch thick, for lining cabinet interiors.

C. Laminate Backing Sheet: NEMA LD3; backing grade, undecorated plastic laminate.

D. Factory Laminated Melamine Faced Panels: Thermally fused melamine on wood particleboard; fabricated in accordance with ALA.

2.03 CASEWORK:

A. Cabinet Materials: Wood particleboard except where plywood is indicated.
   1. Cabinet Body: ¾ inch typical thickness unless otherwise indicated.
      a. Concealed Backs: Minimum ¼ inch thick, with plastic laminate; fully captured in cabinet body.

b. Mounting Rails: Minimum ¾ inch thick; with plastic laminate where exposed to view at cabinet interior.
c. Plastic Laminate for Exposed Ends and Exterior Surfaces: Grade VGS.
d. Plastic Laminate for Interior and Concealed Surfaces: Cabinet liner or melamine.

2. Door and Drawer Fronts: Minimum ¾ inch thick, with grade VGS plastic laminate on front and edges, and cabinet liner or melamine on back; full overlay style.

3. Drawers: Melamine surface.
   a. Drawer Boxes: Minimum ½ inch thick.
   b. Drawer Bottoms: Minimum ¼ inch thick; fully captured in drawer frame.

4. Shelving: Melamine surface; 1 inch thick.
   a. Shelving for cabinets less than 30 inches wide may be ¾ inch thick.

B. Cabinet Types: Typical configurations as described; provide special configurations and features as detailed.

1. Base Cabinets: Nominal dimensions as indicated; integral toe kick base front and back, or adjustable leveler legs with removable toe kick cover.
   a. Accessible Sinks: Fascia and undersink enclosure, fabricated with dimensions in accordance with ADA; enclosure removable for plumbing access.
   b. Microwave Cabinets: Open front and finished interior; with grommet unless receptacle is installed within cabinet.

2. Wall Cabinets: Nominal dimensions as indicated; wall hung.

3. Special Purpose Cabinets and Casework: As detailed.

2.04 HARDWARE:

A. Manufacturers: In accordance with Section 01 6000.
   1. Casework manufacturer's standard.
   2. Blum, Inc.
   3. Häfele America Co.
   4. Hettich America LP.
   5. Knape & Vogt Manufacturing Company (K & V).
   6. C. R. Laurence Co., Inc.
   7. Doug Mockett & Co., Inc.
   8. National Hardware.
   9. Rangine Corp.; Rakks.
   10. Woodworker's Supply.

B. Door and Drawer Pulls: Extruded aluminum, U shaped wire pulls; finish as selected.

C. Shelf Clips for Adjustable Shelving: Heavy duty plastic; L shaped with locking feature; two pins sized to fit holes in cabinet sides. (K & V 340; Häfele 282.47.404)

D. Drawer Slides: ANSI A156.9; epoxy coated steel with nylon rollers; self closing; minimum 100 lb capacity.

E. Hinges: Concealed type, self closing, minimum 95 degree opening angle; nickel plated finish; with die cast zinc mounting plate; with adapter for face frame mounting. (Blum Inserta series)

F. Door Catches: Roller type, magnetic type, or integral with hinge assembly.

G. Door Stops: Chain type or bar type; provide for doors located adjacent to walls, deeper cabinets, or other locations where door swing restriction is necessary.

H. Grommets: Plastic liner for cut-outs; removable cap with pivoting cord slot cover; color as selected; 2½ inch nominal diameter unless otherwise indicated.
   1. Provide minimum 2 grommets per work station. Where locations are not specifically indicated, field verify locations.

I. Countertop Support Brackets: Formed steel L shape brackets; white epoxy coated finish; size approximately 6 inches less than nominal countertop depth. (Rakks EH series)

2.05 ACCESSORIES:

A. Adhesive: Type recommended by AWI and laminate manufacturer to suit application.

B. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; chrome finish.

C. Silencers: Resilient rubber; self adhesive.

D. Concealed Joint Fasteners: Threaded steel.

E. Resilient Base: As specified in Section 09 6500; material and color to match remainder of room.

F. Accessories: Cutouts, fillers, scribes, finished ends, finished backs and tops; as indicated and as required to provide a complete and finished project.
   1. Where cabinets do not extend completely into corners, provide wall cabinet top and bottom fillers to close spaces between cabinets and walls.

2.06 FABRICATION:

A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.

B. Join components with concealed fasteners and with mortise and tenons or with dowels glued under pressure; countersink exposed fasteners.

C. Provide minimum two silencers for each door and drawer.

D. Locate applied door catches at head or jamb of single door openings, and at head of double door openings.

E. At adjustable shelving locations, provide 5mm holes in cabinet sides for shelf clips at vertical spacing of 32mm o.c., at front and back of cabinet.

F. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide filler sections and trim for scribing and site cutting.

G. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.

H. Apply laminate backing sheet to reverse side of laminate finished surfaces where concealed.

I. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, fixtures and fittings. Verify locations of cutouts from on-site dimensions. Coordinate dimensions of cutouts with the work of other Sections. Seal cut edges.

2.07 FACTORY FINISHING:

A. Sand work smooth and set exposed fasteners.

B. Apply wood filler in exposed nail and screw indentations.

C. Finish exposed to view, internal, and semi-concealed surfaces, except prefinished surfaces.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify existing conditions and dimensions before starting work.

B. Verify adequacy and location of backing and support framing.

C. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION:

A. Set and secure casework in place; rigid, plumb, and level.

B. Use fixture attachments in concealed locations for wall mounted components.

C. Use concealed joint fasteners to align and secure adjoining units and tops.

D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

E. Countersink anchorage devices at exposed locations. Conceal with solid plugs to match surrounding materials; finish flush with surrounding surfaces.

F. Prepare toe kick space for installation of resilient base as specified in Section 09 6500.

G. Coordinate installation of plumbing and electrical connections, and all accessories.

3.03 ADJUSTING:

A. Test installed work for rigidity and ability to support loads.

B. Adjust moving or operating parts to function smoothly and correctly, without warp or bind.

C. Adjust hinges to provide equal clearances on all sides of doors.

3.04 CLEANING: In accordance with Section 01 7700.

A. Perform final cleaning of casework, shelves, hardware, fittings, and fixtures.

3.05 PROTECTION:

A. Protect exposed finished work of other Sections from damage during installation of the work of this section.

END OF SECTION

SECTION 14 2023 – PASSENGER ELEVATORS

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:
   1. Passenger elevator system; holeless type without machine room.
   2. Passenger cab with doors and frames; hoistway entrance doors and frames; signal fixtures.
   3. Motor and pump, controllers, hoistway equipment, and accessories.

B. Related Requirements:
   1. Section 01 5000 – Temporary Facilities and Controls: Temporary power supply; temporary guards at hoistway openings.
   2. Section 03 3000 – Cast-in-Place Concrete: Concrete for elevator motor and pump foundation, enclosed pit, grout for thresholds
   3. Section 05 1200 – Structural Steel Framing: Overhead hoist beams.
   4. Section 05 5133 – Metal Ladders: Pit ladder.
   5. Section 06 0573 – Wood Treatment: Fire retardant treatment.
   6. Section 07 1700 – Bentonite Waterproofing: Waterproofing of elevator pit walls and floor.
   7. Section 07 8400 – Firestopping.
   8. Section 08 3100 – Access Doors: Fire rated access doors into hoistway.
   9. Section 09 2210 – Metal Support Systems: Metal stud framing for hoistway.
   10. Section 09 2900 – Gypsum Wall Board: Gypsum shaft walls.
   11. Section 09 6500 – Resilient Flooring: Flooring and base in cab.
   12. Section 09 9000 – Painting and Coating: Field painting.
   13. Division 21 – Fire Suppression: Sprinkler heads in hoistway.
   14. Division 22 – Plumbing: Pit sump pump and check valve.
   15. Division 23 – Heating, Ventilating, and Air Conditioning: Hoistway venting.
   16. Division 26 – Electrical:
      a. Conduit to elevator equipment devices remote from hoistway.
      b. Electrical characteristics and wiring connections.
      c. Electrical service to fused disconnect including electrical power for elevator installation and testing.
      d. Dry and isolated contact set and wiring between elevator controller and disconnect. Auxiliary contact closed when disconnect switch is in the "On" position and open when disconnect is in the "Off" position.
      e. Heat detectors and shunt trip devices to disconnect elevator equipment prior to activation of sprinkler system.
      f. Electrical service for GFCI outlets in pit; dedicated single receptacle for pit sump pump.
      g. Lighting in pit.

h. Conduit for emergency communication service.

17. Division 27 – Communications: Telephone service to cab.
18. Division 28 – Electronic Safety and Security:
    a. Fire service smoke detectors and interconnecting devices.
    b. Fire alarm signal lines to elevator controller cabinet.

1.02 SYSTEM DESCRIPTION:

A. Elevator System: One unit; holeless hoistway with motor and controller.
    1. Rated Net Capacity: Minimum 3500 lbs.
    2. Rated Speed: Minimum 100 ft/min.
    3. Clear Net Platform Size: Minimum 65 x 77 inches.
    4. Ceiling Height: Minimum 92 inches.
    5. Hoistway and Cab Entrance Frame Opening Sizes: 42 x 84 inches.
    6. Door Type: Double leaf, side opening.
    7. Number of Stops: 2.
    8. Number of Openings: 2 front.
    9. Door Control Features:
        a. Program door control to open doors automatically when car arrives at floor.
        b. If doors are prevented from closing for approximately 10 seconds because of an obstruction, automatically disconnect door reopening devices, close doors more slowly until obstruction is cleared. Sound buzzer.
        c. Allow for manual operation in event of power failure.
        d. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equip with infrared detector device.
    10. Automatic Self Leveling: Bring car to within ½ inch of floor landings at any loading condition from zero load to full rated load, automatically and independent of the operating device. Compensate for overtravel or undertravel.
    11. Automatic Terminal Limits: Electric limit switches in hoistway near terminal landings to cut off electric current and stop car if it runs beyond either terminal landing.
    12. Failure Protection: In event of malfunction due to motor starter failure, low oil in system, or car failing to reach a landing in the up direction within a pre-determined time, car shall automatically descend to lowest terminal landing; open doors to allow passengers to depart, then close doors and render all car station control buttons inoperative except the “door open” button.
    13. Interconnect elevator control system with building fire alarm.
    14. Seismic Design: In accordance with applicable building code.

B. Control System: Two stop automatic push-button operation.
    1. Control system components shall be non-proprietary, with parts, tools, and diagnostic equipment available from third-party sources in addition to original manufacturer.
    2. Set system operation so that momentary pressure of hall button at other landing dispatches car to that landing.

3. Allow call registered by momentary pressure of hall button at any time to remain registered until car stops in response to that call at that landing.
4. If hoistway door is not opened within a short interval after car has stopped at terminal allow car to respond to any call from other landing.

C. Fire Service:
1. Provide "Firefighter's Operation" in accordance with ASME A17.1.
2. Designated Landing: First floor.

1.03 SUBMITTALS: In accordance with Section 01 3300.

A. Shop Drawings: Indicate the following information:
1. Field measurements of clear inside hoistway and pit dimensions, and other critical dimensions.
2. Motor, controller, and other component locations.
3. Car, machine beams, guide rails, buffers, and other components in hoistway.
4. Rail bracket spacing; maximum static and dynamic loads imposed on guide rails requiring load transfer to building structural framing.
5. Individual weight of principal components; load reaction at points of support.
6. Loads on hoisting beams.
7. Clearances and over travel of car.
8. Locations of connections for car light and telephone.
9. Location and sizes of access doors, doors and frames.
10. Expected heat dissipation of elevator equipment.
11. Applicable seismic design data; certified by a registered Professional Engineer.
12. Electrical characteristics and connection requirements.
13. Show arrangement of equipment so moving elements and other equipment can be removed for repairs or replaced without disturbing other components. Arrange equipment for clear passage through access doors.
14. Verify that layout provides required clearances at electrical equipment, and that door swings and other items do not encroach on required clearances.

B. Product Data: Provide data on the following items:
1. Signal and operating fixtures, operating panels, and indicators.
2. Cab design, dimensions, layout, and components.
3. Cab and hoistway door and frame details.

C. Samples: Submit two samples illustrating cab floor material, cab interior finishes, cab and hoistway door and frame finishes, and handrail material and finish. Omit samples for components scheduled to be field painted.

1.04 CLOSEOUT SUBMITTALS: In accordance with Section 01 7700.

A. Certificates and Test Reports:
1. Submit certified reports for each required test, recording the date and time of testing, test results, interpretation of results, and recommended action. When required, provide additional copies for submittal to governing authorities.

2. Submit operating permit for each elevator authorizing normal, unrestricted use. Place original in certificate frame in cab.

B. Operating and Maintenance Data:
   1. Provide emergency evacuation procedure in accordance with ASME A17.4, framed in clear plastic enclosure; mount in clearly visible location near controller.
   2. Include a parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
   3. Provide technical information for servicing operating equipment.
   4. Include legible schematic of piping and wiring diagrams of installed electrical equipment and changes made in the Work. List symbols corresponding to identity or markings on apparatus.
   5. Provide master electric/hydraulic schematic and lubrication chart, each framed with clear plastic cover.

C. Submit Certificate of Insurance for Service Provider.

1.05 QUALITY ASSURANCE:

A. Perform Work in accordance with ASME 17.1, AWS D1.1, NFPA 70, AISC 360, and as supplemented in this section.

B. Fabricate and install door and frame assemblies in accordance with NFPA 80 and UL 10B.

C. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.

D. Installer: Company specializing in performing the work of this section; approved by elevator equipment manufacturer.

E. Maintenance Service Provider: Manufacturer or original installer; currently under contract for maintenance of similar elevators in the area; with service center within 50 miles of project site.

1.06 REGULATORY REQUIREMENTS:

A. Conform to applicable building code and elevator code for manufacture and installation of elevator system.

B. Conform to ADA for provisions for the disabled.

1.07 PREINSTALLATION MEETING: In accordance with Section 01 3100.

A. Review schedule of installation, installation procedures and conditions, and coordination with related work.

1.08 WARRANTY: In accordance with Section 01 7700.

A. Correct defective Work within a one year period after Date of Substantial Completion.

B. Warranty: Include coverage for elevator operating equipment and devices.

1.09 MAINTENANCE SERVICE:

A. Provide service and maintenance of elevator system and components for one year from Date of Substantial Completion.

B. Examine system components monthly. Clean, adjust and lubricate equipment.

C. Include systematic examination, adjustment, and lubrication of elevator equipment; maintain fluid levels. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original equipment. Replace wire ropes when necessary to maintain the required factor of safety.

D. Perform work without removing cars from service during peak traffic periods.

E. Provide emergency call back service during working hours for this maintenance period.

F. Maintain an adequate stock of parts for replacement or emergency purposes at the nearest office of the Service Provider.

G. Perform maintenance work using competent and qualified personnel under the supervision and in the direct employ of the Service Provider.

H. Do not assign or transfer maintenance service to any agent or subcontractor without prior written consent of the Owner.

I. One month prior to expiration of maintenance service, provide proposal to Owner for continuation of service.

PART 2 PRODUCTS

2.01 MANUFACTURERS: In accordance with Section 01 6000.

A. Basis of Design: Otis Elevator Co.; HydroFit series.

B. TK Elevator.

C. KONE Inc.

D. Schindler Elevator Corp.

2.02 MATERIALS:

A. Steel Sections, Shapes, and Bars: ASTM A36.

B. Sheet Steel: ASTM A1008, Class 1, matte finish, stretcher leveled.

C. Galvanized Sheet Steel: ASTM A653 Grade B, zinc coated to G90.

D. Stainless Steel Sections, Shapes, and Bars: ASTM A276, Type 304.

E. Stainless Steel Tubing: ASTM A269, Type 304.

F. Aluminum Sheet and Plate: ASTM B209.

G. Aluminum Extrusions: ASTM B221.

H. Plywood: APA Structural I, Grade C-D, sanded; fire retardant treated.

I. Plastic Laminate: NEMA LD3, Type GP-50 General Purpose Grade, 0.050 inch nominal thickness; color and finish as selected.

2.03 FINISH MATERIALS:

A. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

B. Touch-Up Primer for Galvanized Surfaces: SSPC 20, zinc rich.

C. Primer for Wood Surfaces: Alkyd primer sealer.

D. Finish Painting: In accordance with Section 09 9000; alkyd enamel, semi-gloss; color as selected.

2.04 EQUIPMENT:

A. Motor, Power Equipment, Controller, Controls, Buttons, Wiring and Devices, Indicators: As required by NFPA 70; designed for elevator service.
   1. Power Controller: Microprocessor based; with all necessary electrical contactors, electro-mechanical switches and thermal overload relays; mounted in NEMA 1 enclosure; protected from environmental extremes and vibrations.
   2. Vibration Pads and Sound Isolating Couplings: Mounted to isolate assembly from building structure.
   3. Sound Insulating Panels: Reinforced 14 gauge steel panels with 1 inch thick fiberglass core, 1½ lb. density, affixed to interior; mounted on all sides of power unit frame.

B. Guide Rails, Cables, Spring Buffers, Jack, Attachment Brackets and Anchors: Purpose designed, sized according to code with safety factors.
   1. Guide Rails: Formed steel, fastened to building structure with steel brackets.
   2. Guide Shoes: Roller guides with minimum three tires, mounted on top and bottom of car and counterweight frame, held in contact with guide rail by adjustable devices.
   3. Guide Rail Lubricators: Leakproof reservoir mounted on top of upper guide shoes; with wool felt wiper to apply even, uniform flow of lubricant to face of guide rail.
   4. Spring Buffers: Installed in pit; securely anchored to pit floor or mounted on channels fastened to guide rail.
   5. Jack: Capacity sufficient to lift gross load the height specified; factory tested for adequate strength and freedom from leakage; heavy seamless steel tubing plunger accurately turned and polished; stop ring electrically welded to plunger to positively prevent plunger leaving cylinder; internal guide bearing; packing or seal of suitable design and quality; drip ring around cylinder top; steel pipe cylinder with pipe connection and air bleeder; support brackets welded to jack cylinder; auxiliary safety bulkhead in lower end of cylinder.

2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS:

A. Electrical Characteristics: 480 volts; three phase, 60 Hz; as indicated on Electrical drawings. Provide separate 120 volt, single phase disconnect for cab lighting and receptacles, and related loads.

B. Motor: NEMA MG1.

C. Reduced Voltage Starting: Solid state starter to limit current inrush during starting and to provide gradual motor acceleration; with current limit adjustment range of 200 percent to 450 percent of the overload adjustment range; with integral fault detection and diagnostic system.

D. Disconnect Switch: Factory mount disconnect switch on equipment under provisions of Division 26.

E. Boxes, Conduit, Wiring, and Devices: As required by NFPA 70.

F. Fittings: Steel compression type for electrical metallic tubing. Fittings with set screws are acceptable only when a separate grounding conductor is also installed across the joint.

G. Spare Conductors: Include 10 percent extra conductors and two pairs of shielded audio cables in traveling cables. Do not parallel conductors to increase electric current capacity unless individually fused.

H. Do not use armored flexible metal conduit as a grounding conductor.

I. Include wiring and connections to remote elevator devices. Provide additional components and wiring to suit layout.

J. Include pit stop switch adjacent to pit ladder.

K. Emergency Power and Lighting: 12-volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of building power failure.

2.06 LUBRICATION:

A. Grease Fittings: For lubricating bearings requiring periodic lubrication.

B. Grease Cups: Automatic feed type.

C. Lubrication Points: Visible and easily accessible.

2.07 CAR FABRICATION:

A. Frame: Rigid and braced, rolled or formed steel sections, mounted on resilient isolators.

B. Platform: Steel frame, gusseted and rigidly welded, with fire retardant treated plywood subflooring assembly, ready to receive floor finish.

C. Flooring: Resilient flooring as scheduled; refer to Section 09 6500.

D. Base: Resilient rubber cove; refer to Section 09 6500.

E. Side and Rear Walls: Plastic laminate on plywood.

F. Front Return Panel: Stainless steel.

G. Car Top and Finish Ceiling: Stainless steel. Provide GFCI convenience outlet on car top.

H. Light Fixtures: LED downlights.

I. Ventilation: Two speed exhaust fan mounted on car top; grille in ceiling.

J. Control Panel and Face Plate: Stainless steel with illuminating call buttons.

K. Indicator Panel: Above control panel with illuminating position indicators.

L. Hand Rail: Stainless steel cylindrical tube, spaced from wall 1½ inches with ends returned to wall; placed at rear wall.

M. Certificate Frame and Glazing: Stainless steel frame, clear plastic glazing; attached with tamper proof screws.

2.08 CAB ENTRANCES:

A. Cab Doors: Stainless steel, of hollow reinforced sandwich panel construction, flush design, rolled profiles, rigid construction.

B. Cab Door Frames: Stainless steel.

C. Hangers and Tracks: Sheave type hangers with resilient tires; on smooth steel track.

D. Thresholds: Extruded aluminum, ¼ inch thickness; with grooved guide for non-metallic shoes.

2.09 HOISTWAY ENTRANCES:

A. Hoistway Doors: Baked enamel on steel, flush design, rolled profiles, minimum 16 gauge, rigid construction.

B. Hoistway Door Frames: Baked enamel on steel, of rolled profiles, minimum 14 gauge, welded corner with smooth invisible joints.

C. Hangers and Tracks: Sheave type two point suspension hangers with resilient tires on ball bearings; adjustable slide to accommodate up-thrust; smooth steel track.

D. Interlocks: Prevent operation of car away from landing until doors are locked in closed position; prevent opening doors at any landing from corridor side unless car is at rest at that landing or is in leveling zone and stopping at that landing.

E. Door, Frame and Interlock Construction: Minimum 60 minute fire rating; insulated reinforced sandwich panel door construction 1¼ inch thick minimum.

F. Sills: Extruded aluminum; ¼ inch thickness; grooved surface.

2.10 FINISHES:

A. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.

B. Equipment Components: Clean and degrease; prime one coat; finish with two coats of enamel.

C. Galvanized Surfaces: Clean with neutralizing solvent; prime two coats.

D. Aluminum: Clear anodized finish where exposed to public view; mill finish elsewhere.

E. Wood Surfaces not Exposed to Public View: One coat primer; one coat enamel.

F. Baked Enamel on Steel: Clean and degrease metal surface; apply one coat primer sprayed and baked; two coats enamel sprayed and baked; color as selected.

G. Stainless Steel: NAAMM No. 4 satin finish.

2.11 CAR OPERATING PANEL:

A. Provide one flush mounted operating panel per car with integral face plate; with modular panels containing all operating devices.
   1. Call Buttons: Illuminated; with adjacent raised characters and braille indicators corresponding to each floor served.
   2. DOOR OPEN and DOOR CLOSE buttons, alarm button, and emergency stop switch.
   3. Fire service features and operating instructions in accordance with ASME A17.1.
   4. Car Position Indicator: Indicate position of car in hoistway by illuminating the corresponding alphanumeric landing designation; sound audible signal as display changes.
   5. Communications cabinet with emergency two-way audio-visual device in accordance with ADA; with auxiliary telephone jack.
   6. Additional operating switches and key switches for special features specified.

B. Include matching service cabinet with locking hinged door containing light switch, fan switch, and inspection switch.

2.12 HALL STATIONS:

A. Landing Buttons: Illuminating type, one button; marked with arrows; with stainless steel face plate; with fire service key switch and instructions at designated landing.
   1. Button size: ¾ inch minimum.
   2. Panel Mounting Height: 42 inches above finish floor to center of panel.

B. Landing Identification: Stainless steel plates permanently affixed to both hoistway door frame jambs; with landing designation in 2 inch high raised characters and braille.
   1. Mounting Height: 60 inches above finish floor to center of plate.

PART 3 EXECUTION

3.01 EXAMINATION: In accordance with Section 01 7000.

A. Contractor and elevator supplier shall jointly obtain field measurements of floor-to-floor heights, hoistway, pit, overhead clearance, and other critical dimensions.

B. Verify that hoistway and pit are ready for work of this section.

C. Verify hoistway shaft and openings are of correct size and within tolerance.

D. Verify location and size of machine foundation and position of machine foundation bolts.

E. Verify that electrical power is available and of the correct characteristics.

3.02 PREPARATION:

A. Arrange for temporary electrical power for installation work and testing of elevator components.

3.03 INSTALLATION:

A. Install in accordance with ASME A17.1.

B. Install system components. Connect equipment to building utilities.

C. Provide conduit, boxes, wiring, and accessories.

D. Mount equipment on vibration and acoustic isolators, on bed plate and concrete pad, to prevent transmission of vibrations to structure and to eliminate sources of structure-borne noise from the elevator system. Place unit on structural supports and bearing plates. Securely fasten to building supports. Prevent lateral displacement.

E. Accommodate equipment in space indicated.

F. Install guide rails using threaded bolts with metal shims and lock washers under nuts. Compensate for expansion and contraction movement of guide rails.

G. Accurately machine and align guide rails. Form smooth joints with machined splice plates.

H. Field Welds: Chip and clean away oxidation and residue, wire brush; spot prime with two coats.

I. Coordinate installation of hoistway wall construction with guide rail installation to accurately align entrances with cars. Reduce clearances to minimum safe, workable dimensions at each landing.

J. Install hoistway door sills, frames, and headers in place prior to hoistway wall construction. Grout sills in place. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.

K. Fill hoistway door frames solid with grout in accordance with Section 04 0500.

3.04 ERECTION TOLERANCES: In accordance with Section 01 4000.

A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.

B. Cab Movement on Aligned Guide Rails: Smooth movement, with no objectionable lateral or oscillating movement or vibration.

3.05 FIELD QUALITY CONTROL:

A. Perform tests required by ASME A17.1 Part X and ASME A17.2.

B. Provide two weeks written notice of date and time of tests.

C. Supply instruments and execute specific tests.

D. Perform the following tests in the presence of the Owner and Architect:
   1. Test elevator system at rated capacity; operate continuously for 30 minutes over full travel distance, stopping at each level and proceeding immediately to the next. Record temperature rise of operating equipment during test period. Record failures of elevator to meet specified performance requirements.
   2. At an agreed time during the contract warranty period, and with the building normally occupied using normal building traffic, conduct tests to verify performance. Furnish event recording of all hall call registrations, time initiated, and response time throughout entire normal working day.

E. Permanently install code data plate on controller or main disconnect.

3.06 TESTS BY REGULATORY AGENCIES:

A. Testing by regulatory agencies will be performed at their discretion; documented by the Contractor.

B. Obtain required permits to perform tests. Perform tests required by regulatory agencies.

C. Schedule tests with agencies and Owner, Contractor, and elevator installer present. Provide minimum 48 hours notice to Architect.

D. Furnish test and approval certificates issued by jurisdictional authorities.

E. Provide emergency door release key, fire service key, equipment access key, and fire service operation testing log book at accessible location on the premises; notify fire department of location.

3.07 ADJUSTING: In accordance with Section 01 7000.

A. Adjust for smooth acceleration and deceleration of car so as not to cause passenger discomfort.

B. Adjust automatic floor leveling feature at each floor to achieve ¼ inch from flush, regardless of load or direction of travel.

3.08 CLEANING: In accordance with Section 01 7700.

A. Remove protective coverings from finished surfaces.

B. Clean surfaces and components ready for inspection.

3.09 PROTECTION OF FINISHED WORK: In accordance with Section 01 7000.

A. Provide temporary enclosures, coverings, guards, barriers and other devices required to protect elevator car enclosures, hoistway entrances, signal fixtures and related materials, components and finishes from damage. Maintain protective measures throughout remainder of construction period.

B. Do not permit construction traffic within cab after final cleaning.

END OF SECTION

SECTION 33 4113 – FOUNDATION DRAINAGE

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes: Foundation drainage piping.

B. Related Requirements:
   1. Section 03 3000 – Cast-in-Place Concrete.
   2. Division 31 – Earthwork.
   3. Division 33 – Utilities.

1.02 REGULATORY REQUIREMENTS:

A. Comply with regulations and requirements of environmental agencies and local utilities.

1.03 DELIVERY, STORAGE, AND HANDLING:

A. Load and unload pipe, fittings, and accessories by lifting with hoists or skidding; avoid shock or damage; do not drop materials; do not skid or roll pipe against pipe already on the ground.

PART 2 PRODUCTS

2.01 PIPING MATERIALS:

A. Subdrainage Piping: AASHTO M252, Type SP; perforated polyethylene corrugated pipe with smooth interior and annular exterior; injection molded fittings.
   1. Joints: ASTM F477.

B. Size: 4 inch inside diameter, unless otherwise indicated.

C. Where connections to existing systems are required, verify materials and provide appropriate adapters.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Prior to the work of this Section, inspect the site and verify that work can be installed in accordance with the original design. In the case of any discrepancy, immediately contact the Architect.

3.02 INSTALLATION:

A. Perform trenching and backfilling in accordance with Division 31.

B. Install drainage system in accordance with ASTM D2321 and as recommended by manufacturer.

C. Subdrainage Piping: Install on solid bed of stone, with slope of minimum 1/8 inch per lineal foot from high point to outlet. Except where detailed otherwise, cover with minimum 12 inch granular material before backfilling.

D. Do not connect down pipe discharge or other storm drainage to foundation drainage system.

END OF SECTION