

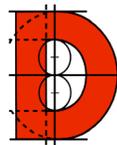
INTERIOR RENOVATIONS
of the
INDIAN RIVER COUNTY
BUILDING AND FIRE DEPARTMENTS

INDIAN RIVER COUNTY, FLORIDA
IRC BID NO. 2020057



Architectural Project Manual
Bid Set

Project No. 2019.48.002
August 23, 2020



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SECTION 01100 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
1. Work covered by the Contract Documents.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: **INTERIOR RENOVATIONS TO THE
BUILDING AND FIRE
DEPARTMENTS
IRC BID NO. 2020057**

DONADIO & ASSOCIATES PROJECT NO. 2019.48

Project Location: **1801 27TH STREET
VERO BEACH, FL 32960**

- B. Owner: **INDIAN RIVER COUNTY**

- C. Architect: **DONADIO & ASSOCIATES ARCHITECTS P. A.
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- D. The Work consists of the following:
The Project consists of Demolition/Removal of all material and systems called out for in the existing Community Development Department, Building Department and Fire and Emergency Services Department. The Project involves Complete Interior Renovation of the Building and Fire Department Areas of the Community Development office location. Expansion into and taking over the existing Deli Area. Re arranging the functions of the Departments to provide better function and flow. Rearranging areas to provide better customer service, add working space, security, and employee protection. Demolition of existing areas to accommodate the new floor plan and layout. This work involves new walls, ceilings, finishes and mechanical, electrical, and plumbing work as detailed in The Construction Plans and These Specifications.

This project will need to be conducted in phases to keep the office functions running during regular business hours. This project will also involve night and weekend work to accomplish the phasing and operation.

Proposed Project Phasing Plan:

Phase #1 Fire Department staff to be relocated to another area in the Building. The Fire Department area would be demolished and constructed per the plans. The current Deli Area would also be included in this Phase #1 Area. This will allow staff in areas marked as Phase #2 to relocate to the Phase #1 area when completed.

Phase #2 as shown will be demolished and constructed per the plans. The Document Center will be moved into the new Document Center Area allowing the equipment to be moved once. The new Conference Room will be used for Contractor Licensing or other staff.

Phase #3 is the Main Public Service area where the main operation occurs, building Support Specialists, etc. Staff in Phase #3 Area would then move back into portions of Phase #2 Area and into the Phase #1 Fire Area. Public will be able to access the Planning, Code Enforcement, and the Building Division Areas through Door #100. Public and Customers can be brought through this area, through the POD Office Space and use the long corridor to access the back-staff areas. This new door can be accessed from the Main Atrium down a back corridor. This will allow the entire Phase #3 Area to be worked on w/o having to arrange for public access in the Phase #3 Area

END OF SECTION 01100

SECTION 01732 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

1.2 DEFINITIONS

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

1.3 PREINSTALLATION MEETINGS

- A. Pre demolition Conference: Conduct conference at Project sit.

1.4 INFORMATIONAL SUBMITTALS

- A. Pre demolition Photographs or Video: Submit before Work begins.

1.5 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 1. Before selective demolition, Owner will remove the following items:
 - a. All desks, chairs, conference tables, modular furniture and filing cabinets.

- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and/or preconstruction videotapes.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Building manager will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off indicated utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

3.3 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 5. Dispose of demolished items and materials promptly.
- B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

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

3.5 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

01732

SECTION 05400 – COLD- FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and Technical Provisions of the Contract, including General and Supplementary Conditions and Division 0 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Types of cold-formed metal framing units include the following:
 - 1. C-shaped steel framing members.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
 - 1. Shop drawings shall show all connections and details for structural framing installation.
 - a. Include placing drawings for framing members showing size and gauge designations, number, type, location, and spacing. Indicate supplemental strapping, bracing, splices, bridging, accessories, and details required for proper installation.
 - 2. Product data and installation instructions for each item of cold-formed metal framing and accessories.

1.4 QUALITY ASSURANCE

- A. Component Design: Calculate structural properties of studs and joists in accordance with American Iron and Steel Institute (AISI) “Specification for Design of Cold-Formed Steel Structural Members.”
- B. Welding: Use qualified welders and comply with American Welding Society (AWS) D1.3, “Structural Welding Code – Sheet Steel.”

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, provide materials manufactured by one of the following
 1. Dale Industries, Inc.
 2. Dietrich Industries, Inc.
 3. Marino Industries, Inc.
 4. Superior Steel Studs, Inc.
 5. Unimast, Inc.

2.2 METAL FRAMING

- A. System Components: Manufacturers' standard non load-bearing steel studs, size, shape, and gauge as indicated. With each type of metal framing required, provide manufacturer's standard, steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories for applications indicated, as needed to provide a complete metal framing system.
- B. Materials and Finishes:
 1. For 18-gauge, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi, ASTM A 446, A570, or A 611.
 2. Provide galvanized finish to metal framing components complying with ASTM A 525 for minimum G 60 coating.
 - a. Finish of installation accessories to match that of main framing components, unless otherwise indicated.
- C. Fasteners: Provide nuts, bolts, washers, screws, and other fasteners with corrosion-resistant plated finish.
- D. Electrodes for Welding: Comply with AWS Code and as recommended by stud manufacturer.
- E. Galvanizing Repair: Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A 780.

2.3 FABRICATION

- A. General: Framing components may be prefabricated into assemblies before erection. Fabricate panels plumb, square, true to line, and braced against racking with joints welded. Perform lifting of prefabricated units to prevent damage or distortion.
- B. Fabricate units in jig templates to hold members in proper alignment and position and to assure consistent component placement.
- C. Fastenings: Attach similar components by welding. Attach dissimilar components by welding, bolting, or screw fasteners, as standard with manufacturer.
- D. Wire tying of framing components is not permitted.

- E. Fabrication Tolerances: Fabricate units to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations.
- B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 24 inches o.c. spacing for all nail or power-driven fasteners or 16 inches o.c. for other types of attachment. Provide fasteners at corners and ends of tracks.
- C. Installation of Wall Studs: Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges.
- D. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
- E. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.
- F. Install supplementary framing, blocking, and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.
- G. Frame wall openings larger than 2 feet square with double stud at each jamb of frame except where more than two are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated.
- H. Frame both sides of expansion and control joints with separate studs; do not bridge the joint with components of stud system.
- I. Install horizontal stiffeners in stud system, spaced (vertical distance) at not more than 54 inches o.c. Weld at each intersection.
- J. Erection Tolerances: Bolt or weld wall panels (at both horizontal and vertical junctures) to produce flush, even, true-to-line joints.
 - 1. Maximum variation in plane and true position between prefabricated assemblies should not exceed 1/16 inch.
- K. K. Field Painting: Touch-up damaged shop-applied protective coatings. Use compatible primer for prime-coated surfaces; use galvanizing repair system for galvanized surfaces.

END OF SECTION 05400

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Wood blocking, cants, and nailers.
 - 2. Wood sleepers.
 - 3. Plywood backing panels.
- B. Related Sections include the following:
 - 1. Division 2 Section "Termite Control" for site application of borate treatment to wood framing.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of **2 inches nominal (38 mm actual)** or greater but less than **5 inches nominal (114 mm actual)** in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NLGA: National Lumber Grades Authority.
 - 2. SPIB: The Southern Pine Inspection Bureau.

1.4 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Wood-preservative-treated wood.
2. Power-driven fasteners.
3. Powder-actuated fasteners.
4. Expansion anchors.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry, unless otherwise indicated.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 15 percent maximum moisture content and any of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine; SPIB.
 - 3. Spruce-pine-fir; NLGA.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.4 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than **1/2-inch (13-mm)** nominal thickness.

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Power-Driven Fasteners: NES NER-272.
- C. Lag Bolts: **ASME B18.2.1 (ASME B18.2.3.8M)**.
- D. Bolts: Steel bolts complying with **ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6)**; with **ASTM A 563 (ASTM A 563M)** hex nuts and, where indicated, flat washers.
- E. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Stainless steel with bolts and nuts complying with **ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4)**.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Do not splice structural members between supports, unless otherwise indicated.
- D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim. Provide backing in walls for wall stops and TV brackets.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than **16 inches (406 mm)** o.c.
- E. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than **96 inches (2438 mm)** o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and **2-inch nominal- (38-mm actual-)** thickness.
- F. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- G. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2306.1, "Fastening Schedule," in Florida Building Code.
- I. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 WOOD SLEEPER, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 PROTECTION

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

END OF SECTION 06100

SECTION 07841 - THROUGH-PENETRATION FIRESTOP SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.

1.3 PERFORMANCE REQUIREMENTS

- A. General: For penetrations through the following fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems 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 construction penetrated.
 - 1. Fire-resistance-rated walls including fire partitions.
 - 2. Fire-resistance-rated horizontal assemblies including ceiling membranes of roof/ceiling assemblies.
- B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479:
 - 1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling, or exceeding fire-resistance rating of constructions penetrated.
 - 2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:
 - a. Penetrations located outside wall cavities.
 - b. Penetrations located outside fire-resistance-rated shaft enclosures.
- C. For through-penetration firestop 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. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
 - 2. For floor penetrations with annular spaces exceeding 4 inches (100 mm) in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
 - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

- D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
 - 2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- C. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:
 - 1. Types of penetrating items.
 - 2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
 - 3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.
- D. Qualification Data: For Installer.
- E. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors."
- B. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- C. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.
- D. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
 - 1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.

2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:
 - a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
 - b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."
 - 2) OPL in its "Directory of Listed Building Products, Materials, & Assemblies."
 - 3) ITS in its "Di of qualified testing and inspecting agency."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
- B. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, through-penetration firestop systems that may be incorporated into the Work include, but are not limited to, those systems indicated.

2.2 FIRESTOPPING, GENERAL

- A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.
- B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:
 - 1. Permanent forming/damming/backing materials, including the following:
 - a. Slag-/rock-wool-fiber insulation.
 - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Fillers for sealants.
 - 2. Collars.
 - 3. Steel sleeves.
- C. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- D. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 FILL MATERIALS

- A. General: Provide through-penetration firestop systems containing the types of fill materials indicated in the Through-Penetration Firestop System Schedule at the end of Part 3 by referencing the types of materials described in this Article. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.
- B. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- C. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.
- D. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

- E. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.
- F. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- G. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- H. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- I. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.
- J. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- K. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
 - 2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
 - 3. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.4 MIXING

- A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

- A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for firestop systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within **6 inches (150 mm)** of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:
1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
 2. Contractor's name, address, and phone number.
 3. Through-penetration firestop system designation of applicable testing and inspecting agency.
 4. Date of installation.
 5. Through-penetration firestop system manufacturer's name.
 6. Installer's name.

3.5 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION 07841

SECTION 07920 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes joint sealants for the following applications, including those specified by reference to this Section: following applications:
 - 1. Exterior joints in the following vertical surfaces and horizontal non-traffic surfaces:
 - a. Joints between different materials listed above.
 - b. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - c. Control and expansion joints in ceilings and other overhead surfaces.
 - d. Other joints as indicated.
 - 2. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - a. Control and expansion joints on exposed interior surfaces.
 - b. Tile control and expansion joints.
 - c. Vertical joints on exposed surfaces of interior unit masonry concrete walls and partitions.
 - d. Perimeter joints between interior wall surfaces and frames of interior doors windows and elevator entrances.
 - e. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - f. Other joints as indicated.
 - 3. Interior joints in the following horizontal traffic surfaces:
 - a. Control and expansion joints in tile flooring.
 - b. Other joints as indicated.
- B. Related Sections include the following:
 - 1. Division 9 Section "Gypsum Board Assemblies" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.
 - 2. Division 9 Section "Acoustical Panel Ceilings" for sealing edge moldings at perimeters of acoustical ceilings.

1.3 PERFORMANCE REQUIREMENTS

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

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in **1/2-inch- (13-mm-)** wide joints formed between two **6-inch- (150-mm-)** long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- E. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.
- F. Qualification Data: For Installer.
- G. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.
- H. Field Test Report Log: For each elastomeric sealant application.
- I. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.
- J. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the Notice to Proceed with commencement of the Work.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
 - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
 - 3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
 - 4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.
 - 5. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 6. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.

7. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
8. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
9. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

D. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of nonelastomeric sealant and joint substrate indicated.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side
5. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: two years from date of Substantial Completion.

- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 2 years from date of Substantial Completion.
- C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
 - 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

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

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- D. Single-Component Nonsag Polysulfide Sealant:
 - 1. Available Products:
 - a. Pacific Polymers, Inc.; Elastoseal 230 Type I (Gun Grade).
 - b. Polymeric Systems Inc.; PSI-7000.
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 25.
 - 4. Use Related to Exposure: NT (nontraffic).
 - 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
- E. Single-Component Neutral- and Basic-Curing Silicone Sealant:
 - 1. Products:
 - a. Tremco; Spectrem 1 (Basic).
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 100/50.
 - 4. Use Related to Exposure: NT (nontraffic).
 - 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - 6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.
- F. Two - Component, premium-grade, polyurethane-based, elastomeric sealant. (Tilt-Wall Joints)
 - 1. Products:
 - a. Sika Corporation -2c NS EZ Mix
 - 2. Chemical cure non-sag consistency.
 - 3. Meets ASTM C-920, Type M, Grade NS, Class 25, use T, NT, M, G, A, O, I and Federal Specification TT-S-00227E,
 - 4. Type II, Class A. Meets CAN/CGSB 19.24 - M9

2.4 LATEX JOINT SEALANTS

- A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.
- B. Available Products:
 - 1. Pecora Corporation; AC-20+.
 - 2. Sonneborn, Division of ChemRex Inc.; Sonolac.
 - 3. Tremco; Tremflex 834.

2.5 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.
1. Available Products:
 - a. Pecora Corporation; BA-98.
 - b. Tremco; Tremco Acoustical Sealant.

2.6 PREFORMED JOINT SEALANTS

- A. Preformed Foam Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant that is manufactured from high-density urethane foam impregnated with a nondrying, water-repellent agent; is factory produced in precompressed sizes in roll or stick form to fit joint widths indicated; is coated on one side with a pressure-sensitive adhesive and covered with protective wrapping; develops a watertight and airtight seal when compressed to the degree specified by manufacturer; and complies with the following:
1. Products:
 - a. EMSEAL Joint Systems, Ltd.; Emseal 25V.
 - b. illbruck Sealant Systems, Inc.; Wilseal 600.
 - c. Polytite Manufacturing Corporation; Polytite B.
 - d. Polytite Manufacturing Corporation; Polytite Standard.
 - e. Sandell Manufacturing Co., Inc.; Polyseal.
 2. Properties: Permanently elastic, mildew resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.
 - a. Density: 10 lb/cu. ft. (160 kg/cu. m).

2.7 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.8 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.

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

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 - 4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

- H. Installation of Preformed Tapes: Install according to manufacturer's written instructions.
- I. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

- 1. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
- 2. Inspect tested joints and report on the following:

3.5 CLEANING

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

3.6 PROTECTION

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

END OF SECTION 07920

SECTION 08211 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Solid-core doors with wood-veneer, faces.
 - 2. Factory finishing flush wood doors.
 - 3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.3 SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction, louvers, and trim for openings. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
 - 1. Indicate dimensions and locations of mortises and holes for hardware.
 - 2. Indicate dimensions and locations of cutouts.
 - 3. Indicate requirements for veneer matching.
 - 4. Indicate doors to be factory finished and finish requirements.
 - 5. Indicate fire ratings for fire doors.
- C. Samples for Initial Selection: Color charts consisting of actual materials in small sections for the following:
 - 1. Faces of Factory-Finished Doors: Show the full range of colors available for stained finishes.
- D. Samples for Verification:
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
 - 2. Corner sections of doors, approximately 8 by 10 inches (200 by 250 mm), with door faces and edgings representing typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.
- B. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
 - 1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 17 and 50 percent during the remainder of the construction period.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Flush Wood Doors:
 - a. Algoma Hardwoods Inc.
 - b. Buell Door Company.
 - c. Eggers Industries; Architectural Door Division.
 - d. Weyerhaeuser Company.

2.2 DOOR CONSTRUCTION, GENERAL

- A. Certified Wood: Fabricate doors with cores veneers not less than 70 percent of wood products produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- B. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.
- C. Doors for Transparent Finish:
1. Grade: Custom (Grade A faces).
 2. Species and Cut: White birch, rotary cut.
 3. Match between Veneer Leaves: Book match.
 4. Assembly of Veneer Leaves on Door Faces: Running match.
 5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
 6. Stiles: Same species as faces or a compatible species.

2.3 SOLID-CORE DOORS

- A. Particleboard Cores: Comply with the following requirements:
1. Particleboard: ANSI A208.1, Grade LD-1.
 2. Blocking: Provide wood blocking in particleboard-core doors as follows:
 - a. **5-inch (125-mm)** top-rail blocking, in doors indicated to have closers.
 - b. **5-inch (125-mm)** bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
 - c. **5-inch (125-mm)** midrail blocking, in doors indicated to have exit devices.
- B. Interior Veneer-Faced Doors:
1. Core: Either glued block or structural composite lumber.
 2. Construction: Five plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.
 3. Construction: Seven plies, either bonded or nonbonded construction.

2.4 LIGHT FRAMES

- A. Wood Beads for Light Openings in Wood Doors:
 - 1. Wood Species: Same species as door faces.
 - 2. Profile: Flush rectangular beads.
 - 3. At 20-minute, fire-rated, wood-core doors, provide wood beads and metal glazing clips approved for such use.
- B. Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.0478-inch- (1.2-mm-) thick, cold-rolled steel sheet; factory primed and approved for use in doors indicated.

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:
 - 1. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements in NFPA 80 for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 - 1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 - 2. Metal Astragals: Premachine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
- C. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.

2.6 FACTORY FINISHING

- A. General: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated" for factory finishing.
- B. Finish doors at factory.
- C. Finish doors at factory that are indicated to receive transparent finish. Field finish doors indicated to receive opaque finish.
- D. Finish doors at factory where indicated in schedules or on Drawings as factory finished.
- E. Transparent Finish:
 - 1. Grade: Custom.
 - 2. Staining: As selected by Architect from manufacturer's full range.
 - 3. Effect: Semi filled finish.
 - 4. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Manufacturer's Written Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08211

SECTION 08411 - ALUMINUM-FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

- 1. Interior aluminum-framed storefronts.
 - a. Glazing is retained mechanically with gaskets on four sides.

- B. Related Sections include the following:

- 1. Division 7 Section "Joint Sealants" for installation of joint sealants installed with aluminum-framed systems and for sealants to the extent not specified in this Section.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:

- 1. Structural loads.
- 2. Dimensional tolerances of building frame and other adjacent construction.
- 3. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Framing members transferring stresses, including those caused by structural movements, to glazing.
 - c. Loosening or weakening of fasteners, attachments, and other components.
 - d. Sealant failure.

- B. Deflection of Framing Members:

- 1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches (4.1 m) and to 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.
- 2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.
- B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- D. Fabrication Sample: Of each vertical-to-horizontal intersection of systems, made from 12-inch (300-mm) lengths of full-size components and showing details of the following:
 - 1. Joinery.
 - 2. Anchorage.
 - 3. Expansion provisions.
 - 4. Glazing.
- E. Qualification Data: For Installer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems.
- G. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Capable of assuming engineering responsibility and performing work of this Section and who is acceptable to manufacturer.
 - 1. Engineering Responsibility: Preparation of data for aluminum-framed systems including Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Arch Aluminum & Glass Co., Inc.
 2. Kawneer.
 3. YKK
 4. Vistawall Architectural Products.

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
1. Sheet and Plate: **ASTM B 209 (ASTM B 209M)**.
 2. Extruded Bars, Rods, Profiles, and Tubes: **ASTM B 221 (ASTM B 221M)**.
 3. Extruded Structural Pipe and Tubes: ASTM B 429.
 4. Structural Profiles: ASTM B 308/B 308M.

2.3 FRAMING SYSTEMS

- A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Construction: Framing members are composite assemblies of two separate extruded-aluminum components permanently bonded by an elastomeric material of low thermal conductance.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 2. Reinforce members as required to receive fastener threads.
- D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- E. Framing System Gaskets and Sealants: Manufacturer's standard recommended by manufacturer for joint type.

2.4 GLAZING SYSTEMS

- A. Glass: Impact resistant glass complying with the Florida Building Code for missile impact requirements.
- B. Glazing Gaskets: Manufacturer's standard compression types, replaceable, molded or extruded, that maintain uniform pressure and watertight seal.

- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric types.

2.5 ACCESSORY MATERIALS

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 7 Section "Joint Sealants."
- B. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.6 FABRICATION

- A. Form aluminum shapes before finishing.
- B. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- C. Mechanically Glazed Framing Members: Fabricate for flush glazing (without projecting stops).
- D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.7 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 - 1. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components plumb and true in alignment with established lines and grades, without warp or rack.

D. Install glazing as specified in Division 8 Section "Glazing."

E. Install perimeter joint sealants as specified in Division 7 Section "Joint Sealants" and to produce weathertight installation.

F. Erection Tolerances: Install aluminum-framed systems to comply with the following maximum tolerances:

1. Location and Plane: Limit variation from true location and plane to **1/8 inch in 12 feet (3 mm in 3.7 m)**; **1/4 inch (6 mm)** over total length.
2. Alignment:
 - a. Where surfaces abut in line, limit offset from true alignment to **1/16 inch (1.5 mm)**.
 - b. Where surfaces meet at corners, limit offset from true alignment to **1/32 inch (0.8 mm)**.
3. Diagonal Measurements: Limit difference between diagonal measurement to **1/8 inch (3 mm)**.

END OF SECTION 08411

SECTION 08710 FINISH HARDWARE

PART 1 GENERAL

1.01 WORK INCLUDED

- A. The work in this section shall include furnishing of all items of finish hardware as hereinafter specified or obviously necessary to complete the building, except those items that are specifically excluded from this section of the specification. unless field verification of existing finish hardware, in the area of work, are found to be different.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. 08211 - Wood Doors
- B. 08411 - Storefront, and Fixed Glass

1.03 DESCRIPTION OF WORK

- A. Furnish labor and material to complete hardware work indicated, as specified herein, or as may be required by actual conditions at building.
- B. Include all necessary screws, bolts, expansion shields, other devices, if necessary, as required for proper hardware application. The hardware supplier shall assume all responsibility for correct quantities.
- C. Hardware shall meet the requirements of Federal, State and Local codes having jurisdiction over this project, notwithstanding any real or apparent conflict therewith in these specifications.
- E. Fasteners:
 - 1. Hardware as furnished shall conform to published templates generally prepared for machine screw installation.
 - 2. Furnish each item complete with all screws required for installation. Typically, all exposed screws installation.
 - 3. Insofar as practical, furnished concealed type fasteners for hardware units that have exposed screws shall be furnished with Phillips flat head screws, finished to match adjacent hardware.
 - 4. Door closers and exit devices to be installed with closed head through bolts (sex bolts).

1.04 QUALITY ASSURANCE

- A. The supplier to be a directly franchised distributor of the products to be furnished and have in their employ an AHC (Architectural Hardware Consultant). This person is to be available for consultation to the architect, owner and the general contractor at reasonable times during the course of work.
- B. The finish hardware supplier shall prepare and submit to the architect six (6) copies of a complete schedule identifying each door and each set number, following the numbering system and not creating any separate system himself. He shall submit the schedule for review, make corrections as directed and resubmit the corrected schedule for final approval. Approval of schedule will not relieve Contractor of the responsibility for furnishing all necessary hardware, including the responsibility for furnishing correct quantities.
- C. No manufacturing orders shall be placed until detailed schedule has been submitted to the architect and written approval received.
- D. After hardware schedule has been approved, furnish templates required by manufacturing contractors for making proper provisions in their work for accurate fitting, finishing hardware setting. Furnish templates in ample time to facilitate progress of work.
- E. Hardware supplier shall have an office and warehouse facilities to accommodate the materials used on this project. The supplier must be an authorized distributor of the products specified.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Wrap, protect finishing hardware items for shipment. Deliver to manufacturing contractors hardware items required by them for their application; deliver balance of hardware to job; store in designated location. Each item shall be clearly marked with its intended location.

1.06 WARRANTY

- A. The material furnished shall be warranted for one year after installation or longer as the individual manufacturer’s warranty permits.
- B. The manufacturer against failure due to defective materials and workmanship shall warrant overhead door closers in writing for a period of ten (10) years. Commencing on the Date of Final Completion and Acceptance, and in the event of failure, the manufacture is to promptly repair or replace the defective with no additional cost to the Owner.

PART II PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. To the greatest extent possible, obtain each kind of hardware from only one manufacturer.
- B. All numbers and symbols used herein have been taken from the current catalogues of the following manufacturers.

PRODUCT	ACCEPTABLE MANUFACTURER	ACCEPTABLE SUBSTITUTE
1) Hinges	Ives	Hager, Stanley, Bommer
2) Locks & Latches	Schlage	Approved Equal
3) Door Closers	LCN	Approved Equal
4) Exit Devices	Von Duprin	Approved Equal
5) Wall Stops/Floor Stops, Flush bolts	Ives	Burns, Rockwood,
6) Threshold/Weather-strip	Zero	National Guard, Pemko
7) Silencers	Ives	Trimco, Rockwood
8) Key Cabinet	Lund	Key Control

- C. If material manufactured by other than that specified or listed herewith as an equal, is to be bid upon, permission must be requested from the architect seven (7) days prior to bidding. If substitution is allowed, it will be so noted by addendum.

2.02 FINISH OF HARDWARE:

- B. Interior Hinges to be dull chrome(26D). Locks to be Satin Chrome (26D), Flat Goods to be Satin Chrome (26D) or Stainless Steel (32D) and the Thresholds to be Mill Finish Aluminum, unless field verification of existing finishes in the area of work, are found to be different.

2.03 HINGES AND PIVOTS:

- A. Butts on all out swinging doors shall be furnished with non-removable pins (NRP).
- B. Interior butts shall be as listed.
- C. Doors 5’ or less in height shall have two (2) butts. Furnish one (1) additional butt for each 2’6” in height or fraction thereof. Dutch door shall have two (2) butts per leaf.

2.04 KEYING:

- A. Equip locks and cylinders with mastered keyed and construction keyed cylinders.
- B. All bittings shall be issued by lock manufacture per owners instructions.
- C. Provide Four (2) each change keys per lock and Six (6) each grand master, master keys, control keys and (10) each construction keys. Key Schedule:
- D. After a keying meeting between representatives of the Owner, Architect, hardware supplier—provide a keying schedule listing the levels of keying as well as an explanation of the key system's function, the key symbols used and the door numbers controlled.
- E. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
- F. Forward bitting list, key cuts and key system schematic directly to owner, by a means as directed by owner.
- G. Provide temporary cores during construction, Construction Key where not removable core.

2.05 LOCKSETS:

- C. A. Locksets shall be Schlage L, and AL Series, unless field verification of existing locksets, in the area of work, are found to be different. Lever designs to match existing.

2.06 CLOSERS:

- A. Scheduled Manufacturer: LCN 4040XP series and 1461 Series
- B. Requirements:
- C. Provide door closers certified to ANSI/BHMA A156.4 Grade 1 requirements by a BHMA certified independent testing laboratory. Closers shall be ISO 9000 certified. Units shall be stamped with date of manufacture code.
- D. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder, and shall utilize full complement bearings at shaft. Cylinder body shall be 1-1/2 inch diameter, and double heat-treated pinion shall be 11/16 inch diameter.
- E. Provide hydraulic fluid requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F. Fluid shall be fireproof and shall pass the requirements of the UL10C “positive pressure” fire test.
- F. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force as required by accessibility codes and standards. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
- G. Provide closers with a solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
- H. Closers shall not incorporate Pressure Relief Valve (PRV) technology.
- I. Closer cylinders, arms, adapter plates, and metal covers shall have a powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or shall have special rust inhibitor (SRI).
- J. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
- K. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.

2.08 TRIM AND PLATES:

- A. Kick plates, mop plates, and armor plates, shall be .050 gauge with 32D finish. Kick plates to be 8” high, mop plates to be 4” high. All plates shall be two (2) inches less full width of a single door. One (1) inch less door width on a pair of doors.
- B. Push plates, pull plates, door pulls, and miscellaneous door trim shall be shown in the hardware schedule.

2.09 DOOR STOPS:

- A. Doorstops shall be furnished for all doors to prevent damage to doors or hardware from striking adjacent walls or fixtures. Wall bumpers equal to Ives WS407 Series are preferred, but where not practical furnish floor stops equal to Ives FS436 or FS438 series. Where conditions prohibit the use of either wall or floor type stops, furnish surface mounted overhead stops equal to Glynn Johnson, 450 Series.

2.10 THRESHOLDS AND WEATHERSTRIP:

- A. Thresholds and weather-strip shall be as listed in the hardware schedule.

2.11 DOOR SILENCERS:

- A. Furnish rubber door silencers equal to Ives SR64 for all new interior hollow metal frames, (2) per pair and (3) per single door frame.

PART III EXECUTION

3.01 INSTALLATION:

- A. All hardware shall be applied and installed in accordance with the Finish Hardware schedule. Care shall be exercised not to mar or damage adjacent work.
- B. Contractor to provide a secure lock-up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items that are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses both before and after installation.
- C. No hardware is to be installed until the hardware manufactures have provided a pre-installation class to insure proper installation of the specified products. A post installation inspection by a manufacturer's representative will be provided to insure proper installation.

3.02 ADJUSTING AND CLEANING:

- A. Contractor shall adjust all hardware in strict compliance with manufacturer's instructions. Prior to turning project to owner, contractor shall clean and make any final adjustments to the finish hardware.

3.03 PROTECTION:

- A. Contractor shall protect the hardware, as it is stored on construction site in a covered and dry place.
- B. Contractor shall protect exposed hardware installed on doors during the construction phase.

3.04

END OF SECTION 08710

SECTION 08800 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
 - 1. Interior storefront windows.
 - 2. Glazing sealants and accessories.

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of the following products; **12 inches (300 mm)** square.
 - 1. Laminated glass.
- C. Glazing Accessory Samples: For sealants and colored spacers, in **12-inch (300-mm)** lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.

- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For glass.
- B. Preconstruction adhesion and compatibility test report.
- C. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- B. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- C. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

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

1.10 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AGC Glass Company North America, Inc.
 - 2. Cardinal Glass Industries.
 - 3. Guardian Glass; SunGuard.
 - 4. Oldcastle BuildingEnvelope™.
- B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

1.11 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal movement and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants deterioration of glazing materials; or other defects in construction.
- B. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- C. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 - 1. For laminated glass lites, properties are based on products of construction indicated.

1.12 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

1.13 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.
- B. Ultraclear Float Glass: ASTM C1036, Type I, Class I (clear), Quality-Q3; and with visible light transmission of not less than 91 percent and solar heat gain coefficient of not less than 0.87.
- C. Tinted Annealed Float Glass: ASTM C1036, Type I, Class 2 (tinted), Quality-Q3.
- D. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- E. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

1.14 LAMINATED GLASS

- A. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Construction: Laminate glass with polyvinyl butyral interlayer or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written instructions.
 - 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 - 3. Interlayer Color: Clear unless otherwise indicated.
- B. Windborne-Debris-Impact-Resistant Laminated Glass: Comply with requirements specified above for laminated glass except laminate glass with one of the following to comply with interlayer manufacturer's written instructions:
 - 1. Polyvinyl butyral interlayer.

1.15 GLAZING SEALANTS

- A. General:
 - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 100/50, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Corning Corporation.
 - b. GE Construction Sealants; Momentive Performance Materials Inc.
 - c. Pecora Corporation.
 - d. Sika Corporation.
 - e. Tremco Incorporated.

1.16 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

1.17 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

- C. Setting Blocks:
 - 1. EPDM with a Shore A durometer hardness of 85, plus or minus 5.
 - 2. Type recommended by sealant or glass manufacturer.
- D. Spacers:
 - 1. Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
 - 2. Type recommended by sealant or glass manufacturer.
- E. Edge Blocks:
 - 1. EPDM with a Shore A durometer hardness per manufacturer's written instructions.
 - 2. Type recommended by sealant or glass manufacturer.
- F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

1.18 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Minimum required face and edge clearances.
 - 3. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

2.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate interior surfaces. Label or mark units as needed so interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

2.3 GLAZING, GENERAL

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

- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

2.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

2.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

- E. Install gaskets so they protrude past face of glazing stops.

2.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

2.7 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

2.8 LAMINATED GLASS SCHEDULE

- A. Glass Type: Laminated interior vision glass with two plies of clear annealed heat-strengthened float glass.
 - 1. Minimum Thickness of Each Glass Ply: 6 mm
 - 2. Interlayer Thickness: 0.090 inch. Century Glass Plus
 - 3. Tint Color: Clear.
 - 4. Safety glazing required.

END OF SECTION 08800

SECTION 09250 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Interior gypsum board.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for wood framing and furring that supports gypsum board.
 - 2. Division 7 Section "Joint Sealants" for acoustical sealants installed in assemblies that incorporate gypsum board.
 - 3. Division 9 Section "Ceramic Tile" for cementitious backer units installed as substrates for ceramic tile.
 - 4. Division 9 painting Sections for primers applied to gypsum board surfaces.

1.3 SUBMITTALS

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

1.4 STORAGE AND HANDLING

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

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. G-P Gypsum.
- b. National Gypsum Company.
- c. USG Corporation.

- B. Regular Type:

- 1. Thickness: 1/2 inch (12.7 mm).
- 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.

- 1. Material: Plastic.
- 2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. Expansion (control) joint.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.

- B. Joint Tape:

- 1. Interior Gypsum Wallboard: Paper.
- 2. Tile Backing Panels: As recommended by panel manufacturer.

- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
- D. Acoustical Sealant: As specified in Division 7 Section "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.

- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than **1/16 inch (1.5 mm)** of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than **8 sq. ft. (0.7 sq. m)** in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow **1/4- to 3/8-inch- (6.4- to 9.5-mm-)** wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide **1/4- to 1/2-inch- (6.4- to 12.7-mm-)** wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Regular Type: As indicated on Drawings.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
 - 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners, unless otherwise indicated.
 - 2. LC-Bead: Use at exposed panel edges.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below:
 - 1. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in other Division 9 Sections.

3.6 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09250

SECTION 09310 - CERAMIC TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Porcelain Floor Tile
 - 2. Stone thresholds installed as part of tile installations.
- B. Related Sections include the following:
 - 1. Division 7 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.

1.3 DEFINITIONS

- A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.
- B. Facial Dimension: Actual tile size (minor facial dimension as measured per ASTM C 499).
- C. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

1.4 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - 1. Level Surfaces: Minimum 0.6.
 - 2. Ramp Surfaces: Minimum 0.8.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.

- C. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Full-size units of each type of trim and accessory for each color and finish required.
 - 3. Stone thresholds in 6-inch (150-mm) lengths.
- D. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- E. Product Certificates: For each type of product, signed by product manufacturer.
- F. Qualification Data: For Installer.
- G. Material Test Reports: For each tile-setting and -grouting product.

1.6 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain all tile of same type and color or finish from one source or producer.
 - 1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
 - 1. Stone thresholds.
 - 2. Joint sealants.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store liquid latexes in unopened containers and protected from freezing.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.9 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
 - 2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.
- C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
 - 1. As selected by Architect from manufacturer's full range.
- D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.
 - 1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.2 TILE PRODUCTS

- A. Manufacturers:
 - 1. Daltile; Div. of Dal-Tile International Inc. Basis of Design
- B. Porcelain Floor Tile: Flat tile as follows:
 - 1. Module Size: 18 by 18 inches.
 - 2. Thickness: 5/16 inch (8 mm).
 - 3. Face: Plain with cushion edges.
 - 4. Finish: Mat, clear glaze.
 - 5. Mounting: Factory back-mounted..

2.3 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
 - 1. Bevel edges at 1:2 slope, aligning lower edge of bevel with adjacent floor finish. Limit height of bevel to 1/2 inch (12.7 mm) or less, and finish bevel to match face of threshold.
- B. Marble Thresholds: ASTM C 503 with a minimum abrasion resistance of [10] [12] per ASTM C 1353 or ASTM C 241 and with honed finish.
 - 1. Description: Uniform, fine- to medium-grained white stone with gray veining.
 - 2. Description: Match Architect's sample.

2.4 SETTING AND GROUTING MATERIALS

- A. Available Manufacturers:
 - 1. Bonsal, W. R., Company.
 - 2. LATICRETE International Inc.
 - 3. TEC Specialty Products Inc.
- B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:
 - 1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.
 - 2. Prepackaged dry-mortar mix combined with acrylic resin liquid-latex additive.
 - a. For wall applications, provide nonsagging mortar that complies with Paragraph F-4.6.1 in addition to the other requirements in ANSI A118.4.
- C. Medium-Bed, Latex-Portland Cement Mortar: Provide materials composed as follows, with physical properties equaling or exceeding those required for thin-set mortars based on testing of medium-bed specimens according to ANSI A118.4:
 - 1. Prepackaged dry-mortar mix combined with acrylic resin liquid-latex additive.

- D. Polymer-Modified Tile Grout: ANSI A118.7, color as indicated.
1. Polymer Type: Ethylene vinyl acetate, in dry, redispersible form, prepackaged with other dry ingredients.
 2. Polymer Type: Acrylic resin in liquid-latex form for addition to prepackaged dry-grout mix.
 3. Polymer Type: Either ethylene vinyl acetate, in dry, redispersible form, prepackaged with other dry ingredients, or acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.
 - a. Unsanded grout mixture for joints **1/8 inch (3.2 mm)** and narrower.

2.5 ELASTOMERIC SEALANTS

- A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 7 Section "Joint Sealants."
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
1. Available Products:
 - a. Dow Corning Corporation; Dow Corning 786.
 - b. GE Silicones; Sanitary 1700.
 - c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
 - d. Tremco, Inc.; Tremsil 600 White.
 - e. Insert manufacturer's name; product.
- D. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.
1. Available Products:
 - a. Bostik; Chem-Calk 550.
 - b. Mameco International, Inc.; Vulkem 245.
 - c. Pecora Corporation; NR-200 Urexpan.
 - d. Tremco, Inc.; THC-900.
 - e. Insert manufacturer's name; product.

2.6 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- C. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.
 - 1. Available Products:
 - a. Bonsal, W. R., Company; Grout Sealer.
 - b. Bostik; CeramaSeal Grout Sealer.
 - c. C-Cure; Penetrating Sealer 978.
 - d. Custom Building Products; Sealer.
 - e. Jamo Inc.; Sealer.
 - f. MAPEI Corporation; KER .
 - g. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
 - h. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
 - i. TEC Specialty Products Inc.; Grout Sealer.

2.7 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
 - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- 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 plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. 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 space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
- F. Lay out tile wainscots to next full tile beyond dimensions indicated.
- G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

- H. Grout tile to comply with requirements of the following tile installation standards:
 - 1. For ceramic tile grouts (sand-portland cement; dry-set, commercial portland cement; and latex-portland cement grouts), comply with ANSI A108.10.
 - 2. For chemical-resistant epoxy grouts, comply with ANSI A108.6.
- I. At locations where indicated, install cementitious backer units and treat joints to comply with ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.4 FLOOR TILE INSTALLATION

- A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCA installation methods and ANSI A108 Series of tile installation standards.
 - 1. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.
 - a. Tile floors composed of tiles **13 by 13 inches** or larger.
 - b. Tile floors composed of rib-backed tiles.
- B. Joint Widths: Install tile on floors with the following joint widths:
 - 1. Porcelain Tile: **3/16 inch**.
- C. Stone Thresholds: Install stone thresholds at locations indicated; set in same type of setting bed as abutting field tile, unless otherwise indicated.
 - 1. Set thresholds in latex-portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent nontile floor finish.
- D. Grout Sealer: Apply grout sealer to grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.5 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove epoxy and latex-portland cement grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

3.6 FLOOR TILE INSTALLATION SCHEDULE

- A. Tile Installation: Interior floor installation on concrete; thin-set mortar, grout; TCA F115 and ANSI A108.5.
 - 1. Tile Type: Porcelain Tile.
 - 2. Thin-Set Mortar: Latex- portland cement mortar.
 - 3. Grout: Chemical-resistant, water-cleanable, tile-setting and -grouting epoxy.

END OF SECTION 09310

SECTION 09511 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes acoustical panels and exposed suspension systems for ceilings.
- B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete at ceilings.

1.3 DEFINITIONS

- A. CAC: Ceiling Attenuation Class.
- B. LR: Light Reflectance coefficient.
- C. NRC: Noise Reduction Coefficient.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Ceiling suspension members.
 - 2. Method of attaching hangers to building structure.
- B. Samples for Initial Selection: For components with factory-applied color finishes.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Acoustical Panel: Set of **6-inch- (150-mm-)** square Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension System Members, Moldings, and Trim: Set of **12-inch- (300-mm-)** long Samples of each type, finish, and color.
- D. Qualification Data: For testing agency.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each acoustical panel ceiling.
- F. Research/Evaluation Reports: For each acoustical panel ceiling and components and anchor type.

- G. Maintenance Data: For finishes to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548. NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.
- B. Source Limitations:
 - 1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
 - 2. Suspension System: Obtain each type through one source from a single manufacturer.
- C. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.
- D. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
 - 1. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:
 - a. Smoke-Developed Index: 450 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

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

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
 - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

1.8 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.9 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Panels: Full-size panels equal to 2.0 percent of quantity installed.
 - 2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Mineral Base Panels typical unless noted on Reflected Ceiling Plans. Tiles shall be 24" x 24" non-directional, resistant to high humidity and growth of mold/mildew, with Painted Finish Perforated and Fissured Pattern, Non-Fire-Resistance Rated. Color: White.
 - a. Armstrong World Industries "Fine Fissured" Square Lay-in. #1728
 - b. Celotex Corp. "Vantage 10"
 - c. USG Interiors Radar Climaplus
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following, and the grid system shall be compatible with the tiles to provide resistant to high humidity and growth of mold/mildew:
 - 1. Non-Fire-Resistance Rated Double-Web Steel Suspension Systems:
 - d. Armstrong World Industries, Inc. : Prelude XL 15/16-inch
 - e. Celotex: Classic hook system 15/16-inch
 - 2. Edge Moldings:
 - a. Armstrong World Industries, Inc.
 - b. Chicago Metallic Corporation.
 - c. Fry Reglet Corp.
 - d. USG Interiors, Inc.

2.2 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
 - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface per ASTM E 795.

- B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
 - 1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.
 - C. Coating-Based Antimicrobial Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment consisting of manufacturer's standard formulation with fungicide added to inhibit growth of mold and mildew and showing no mold or mildew growth when tested according to ASTM D 3273.
 - D. Panel-Based Antimicrobial Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial solution that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria.
- 2.3 WATER-FELTED, MINERAL-BASE ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING
- A. Classification: Provide panels complying with ASTM E 1264 for Type III, mineral base with painted finish; Form 2, water felted; and pattern as follows:
 - 1. Pattern: D (fissured).
 - B. Color: White.
 - C. LR: Not less than 0.85.
 - D. NRC: Not less than 0.55.
 - E. CAC: Not less than 35.
 - F. Edge Detail: Tegular Edge
 - G. Thickness: 5/8 inch (15 mm).
 - H. Size: 24 by 24 inches (610 by 610 mm) As indicated on Reflected Ceiling Plan.
- 2.4 METAL SUSPENSION SYSTEMS, GENERAL
- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
 - B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
 - 1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.
 - C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.

- D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than **0.135-inch- (3.5-mm-)** diameter wire.

2.5 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING

- A. Wide-Face, Capped, Double-Web, Hot-Dip Galvanized, **G60 (Z180)**, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, hot-dip galvanized according to ASTM A 653/A 653M, **G60 (Z180)** coating designation, with prefinished, cold-rolled, **15/16-inch- (24-mm-)** wide, aluminum caps on flanges.
1. Structural Classification: Heavy-duty system.
 2. Face Design: Flat, flush.
 3. Face Finish: Painted white.

2.6 METAL EDGE MOLDINGS AND TRIM

- A. Manufacturers:
1. Armstrong World Industries, Inc.
 2. Celotex Corporation; Architectural Ceilings Marketing Dept.
 3. Chicago Metallic Corporation.
 4. USG Interiors, Inc.
- B. Roll-Formed Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.
1. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

2.7 ACOUSTICAL SEALANT

- A. Products:
1. Acoustical Sealant for Exposed and Concealed Joints:
 - a. Pecora Corp; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

- B. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - 1. Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION, GENERAL

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 - 6. Do not attach hangers to steel deck tabs.
 - 7. Do not attach hangers to steel roof deck. Attach hangers to structural members.

8. Space hangers not more than **48 inches (1200 mm)** o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than **8 inches (200 mm)** from ends of each member.
- C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 2. Screw attach moldings to substrate at intervals not more than **16 inches (400 mm)** o.c. and not more than **3 inches (75 mm)** from ends, leveling with ceiling suspension system to a tolerance of **1/8 inch in 12 feet (3.2 mm in 3.66 m)**. Miter corners accurately and connect securely.
- D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. Arrange directionally patterned acoustical panels as follows:
 - a. Install panels with pattern running in one direction parallel to short axis of space.
 2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
 3. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 4. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.4 CLEANING

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

END OF SECTION 09511

SECTION 09650 RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Resilient tile flooring
- B. Resilient base

1.2 REFERENCES

- A. ASTM E84-01 - Method for the Surface Burning Characteristics of Building Materials
- B. ASTM F1066 - Vinyl Composition Floor Tile, Composition 1, Class 2 - through pattern
- C. FS L-F-1641 - Floor Covering, Translucent or Transparent Vinyl Surface, with Backing
- D. FS L-F-475 - Floor Covering, Vinyl Surface (Tile and Roll), with Backing
- E. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate seaming plan, borders and patterns.
- C. Product data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
- D. Samples: Submit two samples 12" x 12" in size illustrating color and pattern for each floor material for each color specified.
- E. Submit two 12" long samples of base and stair material for each color specified.
- F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame/smoke rating requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Protect roll materials from damage by storing on end.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Store materials 3-days prior to installation in area of installation to achieve temperature stability.
- B. Maintain ambient temperature required by adhesive manufacturer 3-days prior to, during, and 24 hours after installation of materials.

1.7 MAINTENANCE DATA

- A. Submit under provisions of Section 01700.
- B. Maintenance Date: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

PART 2 PRODUCTS

2.1 MATERIALS - TILE FLOORING – BASIS of DESIGN

Manufacturer: Mannington Commercial
Style: Brushwork
Color: As selected from Manufacturers Standard colors
Size: 12" x 12"
Gauge: 1/8"

2.2 MATERIALS - BASE

Manufacturer: Johnsonite - Millwork Wall Base
Style: Inflection
Color: As selected from Manufacturers Standard colors
Size: 5-1/4" h

2.3 ACCESSORIES

- A. Sub-floor Filler: Portland cement-based latex underlayment; type recommended by the flooring manufacturer.
- B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.
- C. Edge Strips: Flooring material.
- D. Sealer and Wax: Types recommended by flooring manufacturer.
 - 1. Sealer and wax applied shall meet or exceed the ADAAG slip resistance coefficient of 0.6 on static surfaces and 0.8 on ramps, and submit documentation to the Architect and Owner.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify concrete floors are dry to maximum moisture content of 7%, and exhibit negative alkalinity, carbonization, or dusting, follow manufacturer's instructions.
- B. Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- B. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate

3.3 INSTALLATION - TILE FLOORING

- A. Install in accordance with manufacturer's instructions.
- B. Mix tile from container to ensure shade variations are consistent when tile is placed.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place; press with heavy roller to attain full adhesion.
- E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
- F. Install tile to selected pattern. Allow minimum 1/2 full size tile width at room or area perimeter.
- G. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.
- H. Install resilient edge strips at unprotected or exposed edges and where flooring terminates.
- I. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.
- J. Install flooring in pan type floor access covers. Maintain floor patterns.
- K. At movable partitions, install flooring under partitions without interrupting floor pattern.
- L. Install feature strips, edge strips and floor markings where indicated. Fit joints tightly.

3.4 INSTALLATION - BASE

- A. Fit joints tight and vertical. Maintain minimum measurement of 18" between joints.
- B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use pre-molded units.
- C. Install base on solid backing. Bond tight to wall and floor surfaces.
- D. Scribe and fit to doorframes and other interruptions.

3.5 CLEANING

- A. Clean work under provisions of 01700.
- B. Remove excess adhesive from floor, base and wall surfaces without damage.
- C. Clean, seal, wax floors and base surfaces in accordance with the manufacturer's instructions. Apply a minimum of 2-coats of acrylic polish at installation. Apply, prior to final acceptance, 6 additional coats of polish. (Note, only 4-coats can be applied during one application).
- D. Comply with Owner's special cleaning requirements.

3.6 PROTECTION OF FINISHED WORK

- A. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- A. Cover resilient products until Substantial Completion
- B. Prohibit traffic on floor finish for 48 hours after installation.

END OF SECTION 09650

SECTION 09681 - CARPET TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes modular, fusion-bonded carpet tile.
- B. Related Requirements:
 - 1. Division 9 Section " Resilient Flooring, Wall Base and Accessories" for resilient wall base and accessories installed with carpet tile.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
 - a. Review delivery, storage, and handling procedures.
 - b. Review ambient conditions and ventilation procedures.
 - c. Review subfloor preparation procedures.

1.4 ACTION SUBMITTALS

- A. Manufacturer's Data, Carpeting: Submit data to show compliance with requirements, including independent laboratory test reports and Manufacturer's instructions and recommendations for installation and maintenance.
- B. Submit samples of approved carpet tile for Owner/Architect's color selection as soon as construction begins, so that a color schedule can be prepared for all other interior surfaces. After color is identified, provide the Owner/Architect with 3 identical samples approximately 18" square.
- C. Colors: The Architect reserves the right to reject any carpet tile meeting all other requirements if the currently available color choices are unacceptable. Listing of "acceptable" carpet products is conditional, pending approval of available colors - at the sole discretion of the Architect.
- D. Delivery and Storage: Arrange with General Contractor for any required storage in building at least seven (7) days in advance of arrival of material. Do not deliver materials to project site until permission to do so has been received from Contractor. Deliver materials to job site in manufacturer's bundles, clearly marked as to size, dye lot and materials. Schedule delivery to allow sufficient time for examination of materials by Architect before installation begins. Store materials in designated areas provided by General Contractor and carefully protect against soil, damage, theft and vandalism.

- E. Product Data: For each type of product.
 - 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
 - 2. Include installation recommendations for each type of substrate.

- F. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd. (8.3 sq. m).

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floor covering Installers Association at the Commercial II certification level.
- B. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockups at locations and in sizes shown on Drawings.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104.

1.10 FIELD CONDITIONS

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.11 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, Insert failure characteristic and delamination.
 3. Warranty Period: 10 years from date of Substantial Completion.
- B. Failures:
1. Upon notification during warranty period by Architect or Owner or failure in materials or workmanship, replace, repair or otherwise correct failure at no cost to owner.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Products:
1. J&J Invision; J&J Industries, Inc.
 2. Milliken & Company.
 3. Mohawk Group (The); Mohawk Carpet, LLC.
 4. Patcraft; a division of Shaw Industries, Inc.
 5. Shaw Contract Group; a Berkshire Hathaway company.
 6. Tandus; a Tarkett company.
- B. Color: As selected from the manufactures color chart.
- C. Applied Soil-Resistance Treatment: Manufacturer's standard material.

- D. Antimicrobial Treatment: Manufacturer's standard material.
Each carpeted area to be from the same dye lot excepted where carpeted areas are not connected. Side and end matches; visually excellent with no discernible difference in shading.
Certifications:
- E. A certified statement from an independent testing laboratory shall be issued to the Owner from the carpet tile manufacturer stating that the particular fabric supplied and used meets the following test requirement:
1. Carpet tile, both face and back, used in spaces other than corridors and other means of egress shall meet Federal Flammability standard DOC_FF_1_70, "Standard for the Surface Flammability Carpets" (Methenamine Table Test), ASTM D 2859-70T.
 2. Floor Radiant Panel Test: Rating of 0.44 watts/cm² for corridors, circulation spaces, and rooms larger than 400 sq. ft.; ASTM E 648 and NFPA 253.
 3. Tunnel Test: Maximum flame spread of 75, ASTM E 84.
 4. Static Electricity: 3.0 KV max. at 70 deg F and 20% relative.
 5. All carpet tile shall fulfill the following smoke development requirement: A specific optical density (DM) of 450 or less (flaming), as determined by NFPA 258, Smoke Generation of Solid Materials, 1982.
 6. The Product shall meet the above flammability requirements and have independent certified test data no older than two (2) years.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Installer must examine substrates, areas and conditions under which carpet tile is to be installed for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with installation of carpeting until unsatisfactory conditions have been corrected in a manner acceptable to installer and carpet manufacturer. Examine carpet tile for type, color, pattern, and potential defects.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.

2. Do not install carpet tile over concrete with either excessive moisture or dust producing surface which is not adequately sealed.
3. Concrete should be checked for acidity/alkalinity and should test in the 6.0 to 8.0 range.
4. Concrete must be checked for excessive moisture content or hydro-static moisture content. Excessive moisture is defined as no more than 2.5 lbs. per square foot.
5. Moisture Testing: Perform tests so that each test area does not exceed **200 sq. ft. (18.6 sq. m)**, and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of **3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m)** in 24 hours.
 - b. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
 - c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

C. Coordination:

1. Coordinate carpet tile installation with Contractor's to preclude delays and interferences with other trades and prompt completion of project. Delay installation until space enclosures and other general finish work has been completed; and until construction traffic in carpeted areas will be minimal; and until ambient conditions are being maintained by operation of HVAC system to comply with a minimum temperature of 65 F in spaces to receive flooring for a period of twenty-four (24) hours prior to and during the installation. In no case shall carpet be installed until wall and ceiling finishes are complete and fixed cabinets are in place.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions **1/8 inch (3 mm)** wide or wider and protrusions more than **1/32 inch (0.8 mm)** unless more stringent requirements are required by manufacturer's written instructions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet tile manufacturer.

- C. Maintain dye lot integrity. Do not mix dye lots in same area.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- G. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove yarns that protrude from carpet tile surface.
 - 2. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 09681

SECTION 09912 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Gypsum Board.
 - 2. Galvanized Metal
 - 3. Steel Substrate

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of topcoat product indicated.
- C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 QUALITY ASSURANCE

- A. MPI Standards:
 - 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
 - 2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

- B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
 3. Final approval of color selections will be based on benchmark samples.
 - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Benjamin Moore & Co.
 2. ICI Paints
 3. PPG Architectural Finishes, Inc.
 4. Sherwin-Williams Company.

2.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 2. Step coats on Samples to show each coat required for system.
 3. Label each coat of each Sample.
 4. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:
1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

2.3 PAINT, GENERAL

- A. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. Chemical Components of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions; these requirements do not apply to primers or finishes that are applied in a fabrication or finishing shop:
1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
 2. Nonflat Paints and Coatings: VOC content of not more than 150 g/L.
 3. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).

4. Restricted Components: Paints and coatings shall not contain any of the following:

- a. Acrolein.
- b. Acrylonitrile.
- c. Antimony.
- d. Benzene.
- e. Butyl benzyl phthalate.
- f. Cadmium.
- g. Di (2-ethylhexyl) phthalate.
- h. Di-n-butyl phthalate.
- i. Di-n-octyl phthalate.
- j. 1,2-dichlorobenzene.
- k. Diethyl phthalate.
- l. Dimethyl phthalate.
- m. Ethylbenzene.
- n. Formaldehyde.
- o. Hexavalent chromium.
- p. Isophorone.
- q. Lead.
- r. Mercury.
- s. Methyl ethyl ketone.
- t. Methyl isobutyl ketone.
- u. Methylene chloride.
- v. Naphthalene.
- w. Toluene (methylbenzene).
- x. 1,1,1-trichloroethane.
- y. Vinyl chloride.

- C. Colors: As selected by Architect from manufacturer's full range.
1. .

2.4 PRIMERS/SEALERS

- A. Interior Latex Primer/Sealer: MPI #50.
1. VOC Content: E Range of E1.
2. Environmental Performance Rating: EPR 1.

2.5 LATEX PAINTS

- A. High-Performance Architectural Latex (Low Sheen): MPI #138 (Gloss Level 2).
1. VOC Content: E Range of E1.
2. Environmental Performance Rating: EPR 4.
- B. High-Performance Architectural Latex (Eggshell): MPI #139 (Gloss Level 3).
1. VOC Content: E Range of E2.
2. Environmental Performance Rating: EPR 5.
- C. High-Performance Architectural Latex (Satin): MPI #140 (Gloss Level 4).
1. VOC Content: E Range of E1.
2. Environmental Performance Rating: EPR 4.5.

- D. High-Performance Architectural Latex (Semigloss): MPI #141 (Gloss Level 5).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 5.

2.6 METAL PRIMERS

- A. Alkyd Anticorrosive Metal Primer: MPI #79.
 - 1. VOC Content: E Range of E1.
- B. Quick-Drying Alkyd Metal Primer: MPI #76.
 - 1. VOC Content: E Range of E1.
- C. Cementitious Galvanized-Metal Primer: MPI #26.
 - 1. VOC Content: E Range of E1.

2.7 LATEX PAINTS

- A. Interior Latex (Flat): MPI #53 (Gloss Level 1).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 1.5.
- B. Interior Latex (Low Sheen): MPI #44 (Gloss Level 2).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 1.
- C. Interior Latex (Eggshell): MPI #52 (Gloss Level 3).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 1.
- D. Interior Latex (Satin): MPI #43 (Gloss Level 4).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 1.5.
- E. Interior Latex (Semigloss): MPI #54 (Gloss Level 5).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 2.
- F. Interior Latex (Gloss): MPI #114 (Gloss Level 6, except minimum gloss of 65 units at 60 deg).
 - 1. VOC Content: E Range of E1.
 - 2. Environmental Performance Rating: EPR 2.

2.8 ALKYD PAINTS

- A. Interior Alkyd (Flat): MPI #49 (Gloss Level 1).
 - 1. VOC Content: E Range of E1.
- B. Interior Alkyd (Eggshell): MPI #51 (Gloss Level 3).
 - 1. VOC Content: E Range of E1.
- C. Interior Alkyd (Semigloss): MPI #47 (Gloss Level 5).
 - 1. VOC Content: E Range of E1.

2. Environmental Performance Rating: EPR 1.
- D. Interior Alkyd (Gloss): MPI #48 (Gloss Level 6).
 1. VOC Content: E Range of E1.
- E. Interior Latex (Semigloss): MPI #54 (Gloss Level 5).
 1. VOC Content: E Range of E1.
 2. Environmental Performance Rating: EPR 2.
- F. Interior Latex (Gloss): MPI #114 (Gloss Level 6, except minimum gloss of 65 units at 60 deg).
 1. VOC Content: E Range of E1.
 2. Environmental Performance Rating: EPR 2.
 3. VOC Content: E Range of E1.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Wood: 15 percent.
 2. Gypsum Board: 12 percent.
 3. Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- G. Aluminum Substrates: Remove surface oxidation.
- H. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- I. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
- J. Plaster Substrates: Do not begin paint application until plaster is fully cured and dry.
- K. Spray-Textured Ceiling Substrates: Do not begin paint application until surfaces are dry.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:
 - 1. Mechanical Work:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Tanks that do not have factory-applied final finishes.
 - e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
 - f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
 - 2. Electrical Work:
 - a. Switchgear.
 - b. Panelboards.
 - c. Electrical equipment that is indicated to have a factory-primed finish for field painting.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. Steel Substrates:

- 1. Latex Over Alkyd Primer System: MPI INT 5.1Q.
 - a. Prime Coat: Alkyd anticorrosive metal primer.
 - b. Intermediate Coat: Interior latex matching topcoat.
 - c. Topcoat: Interior latex (low sheen).

B. Galvanized-Metal Substrates:

- 1. Alkyd System: MPI INT 5.3C.
 - a. Prime Coat: Cementitious galvanized-metal primer.
 - b. Intermediate Coat: Interior alkyd matching topcoat.
 - c. Topcoat: Interior alkyd (eggshell).

C. Gypsum Board Substrates:

- 1. Acrylic Over Latex Primer System: MPI INT 9.2C.
 - a. Prime Coat: Interior latex primer/sealer.
 - b. Intermediate Coat: Interior Acrylic matching topcoat.
 - c. Topcoat: Interior alkyd (eggshell).
- 2. High-Performance Architectural Latex System: MPI INT 9.2B.
 - a. Prime Coat: Interior latex primer/sealer.
 - b. Intermediate Coat: High-performance architectural latex matching topcoat.
 - c. Topcoat: High-performance architectural latex (semi-gloss).

END OF SECTION 09912

SECTION 10440 IDENTIFYING DEVICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification section, apply to work of this section.

1.2 SECTION INCLUDES:

- A. Tactile/raised letter plastic signs.
- B. Individual plastic characters signs.
- C. Signs of silk-screened characters on plastic.
- D. Required sign type:
 - 1. Interior room, space and area ID signs.
 - 2. International symbols of accessibility for accessible spaces and exits.
 - 3. Accessible routes and spaces
 - 4. Tactile "exit" signs
 - 5. Hazard and safety signs
 - 6. Evacuation plans
 - 7. Emergency information signs

1.3 REFERENCES

- A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People
- B. Florida Building Code, Chapter 11 and Section 423.14.2
- C. NFPA 101-00: 7.10.1.3.

1.4 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01300.
- B. Shop Drawings: Indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign and anchorage.
- C. Sign Schedule: Provide complete interior and exterior sign schedule showing sign type, location, and verb age.
- D. Samples: Submit two sample signs in size illustrating type, style, letter font and colors specified method of attachment.
- E. Manufacturer's Installation Instructions: Included installation template and attached devices.
- F. Colors: Colors shall be as selected by the Architect.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable codes for requirements for the physically handicapped, safety and egress.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Package signs, labeled in name groups.
- C. Store adhesive attachment tape at ambient room temperatures.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install signs when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.1 FLORIDA AMERICANS WITH DISABILITIES ACT REQUIREMENTS

- A. Manufacturer shall conform to tactile, Braille, letter size, and other requirements as required by Florida Accessibility Code for Building Construction and ANSI A117.1. ADA requirements supersede technical specifications in this Section.

2.2 MANUFACTURER

- A. Identifying devices shall be as manufactured by Andco Industries Corp., or approved equal.
- B. Products of the following manufacturers are acceptable providing their products equal or exceed the quality specified; and they can provide signs of the type, size, finish, letter style, and arrangement required.
 - 1. ASI Sign Systems, Indianapolis, Indiana
 - 2. Best Mfg., Montrose, Colorado
- C. Materials:
 - 1. Plastic Laminate: High-pressure laminate engraving stock with face and core in contrasting color.
 - 2. Aluminum Castings: Alloy recommended by sign manufacturer for casting process used and for use and finish indicated.
 - 3. Plywood: Exterior, Exposure 1, sheathing not less than 3/4-inch (19 mm) thick.
- D. Signs:
 - 1. Unframed Panel Signs: Engraved plastic laminate with beveled edges and rounded corners, 1/8-inch thick.
 - a. Provide signs for all rooms mounted on the wall beside the room door. Provide other signs as required by design.
 - b. Raised copy thickness: not less than 1/32 inch (0.8 mm)
 - c. Sand-blasted method: use this method for removing background material so raised copy is an intrinsic part of the sign material and cannot break off or be removed.
 - d. Braille lettering for all text.

2.3 BUILDING INTERIOR SIGNAGE

- A. Capacity signs for all rooms with a capacity of 50 persons or more as shown on the drawings.
1. Furnish and install signage, 3" inch high by length required, reading "MAXIMUM CAPACITY". Allow for 3 digits maximum after "maximum capacity", copy as shown on the drawings.
 2. Material: 1/8" thick and clear shall have 3/8" radius corners.
 3. Mounting shall be with non-removable oval head screws using shields where mounted on masonry surfaces. Mount at locations as directed by Architect.
 4. Graphic Process: Raised letters and Braille shall be formed as an integral part of the sign face.
 5. Letters: Letters and numbers shall have width to height ratio between 3:5 and 1:1 and stroke width to height ratio between 1:5 and 1:10. Letters and numbers shall be raised 1/32" upper case Helvetica font type with Grade 2 Braille. Raised characters shall be 5/8" high minimum and 2" high maximum. Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram.
 6. Characters and backgrounds must be eggshell, matte or other non-glaze surface.
- B. Room Name and Number Signs
1. Separate signs for each room name and room number are required. 3" inch high by 10" minimum width for signs, longer where nomenclature demands. 3" inch high by 4 inch minimum for 4 digit numbers and letters, and longer where required. Provide 3/8" radius corners.
 2. Mounting: Non-removable oval head screws, using rawl plugs where mounted on masonry.
 3. Number shall be to the left of room name and contiguous to, mounted as directed by Architect. Verify exact location with Architect.
 4. All spaces listed in Finish Schedule plus if more than one door is to a space, additional signs will be required one by number of doors to space.
 5. Material: 1/8" thick matte acrylic plastic with all edges eased.
 6. Graphic Process: Raised letters and Braille shall be formed as an integral part of the sign face.
 7. Colors: Letters and background colors as selected by Architect from manufacturer's standard colors.
 8. Letters: Letters and numbers shall have width to height ratio between 3:5 and 1:1 and a stroke width to height ratio between 1:5 and 1:10. Letters and numbers shall be raised 1/32" upper case Helvetica font type with Grade 2 Braille.
 9. Raised characters shall be 2" high. Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram.
 10. Characters and backgrounds must be eggshell, matte or other non-glaze surface.
- C. Storage Signs
1. Provide and install at mechanical and electrical rooms a sign mounted on the door to read as follows: "COMBUSTIBLE STORAGE NOT PERMITTED"
 2. Signs shall be matte acrylic plastic, red background with white letters 3" high by width needed for copy and Braille, with 3/8" radius corners.
 3. Mount on doors with non-removable oval head screws. Verify number signs required.
 4. Graphic Process: Raised letters and Braille shall be formed as an integral part of sign face.

5. Letters: Letters and numbers shall have width to height ratio between 3:5 and 1:1 and a stroke width to height ratio between 1:5 and 1:10. Letters and numbers shall be raised 1/32" upper case sans serif or simple sans serif type with Grade 2 Braille. Raised characters shall be 2" high. Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram.
6. Characters and backgrounds must be eggshell, matte or other non-glaze surface.

D. Emergency Information Signs

1. Copy to read: "No Exit", "Fire Pull Station Inside", and "Fire Extinguisher Inside"
 - a. See plans for additional signs and required copy.
2. Red letters, Braille, same material, size and mounting in Article 2.03, Interior room name and number signs.

E. Evacuation Plan

1. Provide frame for a graphic floor plan in each student occupied room. Size to be 9" high by 12" in width. Provide a clear removable plastic cover over each sign. Sign cover will only be removable using a tool.
2. Mounting: Mounting: Non-removable oval head screws, using rawl plugs where mounted on masonry. Plan to be supplied by the Architect upon request by the Contractor.
3. Frame Material: Matte acrylic plastic with all edges eased.
4. Plan shall be provided by sign manufacturer and shall be approved graphically by the Architect.

F. Additional Interior Informational Signs

1. Signs shall be of sizes as listed on the drawings.
2. Signs shall be 1/8-inch thick matter acrylic plastic with edges eased.
3. Colors: Letters and background colors as selected by Architect from manufacturer's full range of colors.
4. Graphic Process: Raised letters shall be formed as an integral part of the sign face.
5. Letters: Letters and number shall have width to height ratio between 3:5 and 1:1 and a stroke width to height ration between 1:5 and 1:10. Letters and numbers shall be raised 1/32 inch, uppercase, sans serif or simple sans serif type. Raised characters shall be 1/2-inch high, minimum and 2-inches high maximum. Refer to drawings for sizes indicated.
6. Characters and background must be eggshell, matte or other non-glaze surface.
7. Provide the following signs and additional as required to comply with all applicable codes:
 - a. "Authorized Personnel Only" on storeroom side of all doors entering Storage Rooms.

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Install all signs in strict accordance with manufacturer's instructions and FADA requirements. Room signs to be mounted 60" to center above finish floor on walls adjacent to the latch side of any door opening.
- B. Wall Mounted Panel Signs: Attach panel signs to wall surfaces using the method indicated below:
 1. Mount with non-removable stainless-steel oval head screws, using plastic plugs where mounted on masonry.

- C. Dimensional Letters and Numbers: Mount letters and numbers using standard fastening methods, recommended by the manufacturer for letter form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish letter spaces and to locate holes for fasteners.
 - 1. Flush Mounting: Mount letters with backs in contact with the wall surface.

3.2 CLEANING:

- A. After installation, all exposed surfaces shall be thoroughly cleaned, and all damaged material shall be restored to its original condition or replaced with new material.

3.3 WARRANTY:

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of one (1) year from date of final acceptance of the building against all defects in both workmanship and materials and he shall promptly correct and/or replace such faulty work if so notified.

END OF SECTION 10440

SECTION 10520 - FIRE-PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

- 1. Portable fire extinguishers.
- 2. Fire-protection cabinets for the following:
 - a. Portable fire extinguishers.
- 3. Mounting brackets for fire extinguishers.

- B. Related Sections include the following:

- 1. Division 7 Section "Through-Penetration Firestop Systems" for firestopping sealants at fire-rated cabinets.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection cabinets.

- 1. Fire Extinguishers: Include rating and classification.
- 2. Fire-Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

- B. Samples for Initial Selection: For fire-protection cabinets with factory-applied color finishes.

- C. Samples for Verification: For each type of exposed factory-applied color finish required for fire-protection cabinets, prepared on Samples of size indicated below.

- 1. Size: 6 by 6 inches (150 by 150 mm) square.

- D. Maintenance Data: For fire extinguishers and fire-protection cabinets to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain fire extinguishers and fire-protection cabinets through one source from a single manufacturer.
- B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 - 1. Provide fire extinguishers approved, listed, and labeled by FMG.
- D. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements of ASTM E 814 for fire-resistance rating of walls where they are installed.

1.5 COORDINATION

- A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of portable fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10.
 - b. Faulty operation of valves or release levers.
 - 2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:
 - 1. Sheet: **ASTM B 209** (ASTM B 209M).
- B. Acrylic Bubble: One piece.

2.3 PORTABLE FIRE EXTINGUISHERS

- A. Available Manufacturers:
 - 1. Ansul Incorporated.
 - 2. Fire End & Croker Corporation.
 - 3. JL Industries, Inc.
 - 4. Kidde Fyrnetics.
 - 5. Larsen's Manufacturing Company.
- B. General: Provide fire extinguishers of type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
 - 1. Handles and Levers: Manufacturer's standard.
 - 2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.
- C. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 2-A:10-B:C, **5-lb** (2.3-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.4 FIRE-PROTECTION CABINET

- A. Manufacturers:
 - 1. JL Industries, Inc.
 - 2. Kidde Fyrnetics.
 - 3. Larsen's Manufacturing Company.
- B. Cabinet Type: Suitable for fire extinguisher.
- C. Cabinet Construction: Nonrated and 1-hour fire rated.
- D. Cabinet Material: Enameled-steel sheet.
- E. Semirecessed Cabinet: Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - 1. Rolled-Edge Trim: **2-1/2-inch** (64-mm) backbend depth.
- F. Cabinet Trim Material: Aluminum sheet.

- G. Door Material: Aluminum sheet.
- H. Door Style: Full bubble with frame.
- I. Door Glazing: Molded acrylic bubble.
 - 1. Acrylic Bubble Color: Clear, transparent.
- J. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
 - 1. Provide projecting door pull and friction latch.
 - 2. Provide manufacturer's standard hinge permitting door to open 180 degrees.
- K. Accessories:
 - 1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
 - 2. Lettered Door Handle: One-piece, cast-iron door handle with the word "FIRE" embossed into face.
 - 3. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
 - 4. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
 - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet door.
 - 2) Application Process: Pressure-sensitive vinyl letters.
 - 3) Lettering Color: Red.
 - 4) Orientation: Vertical.
- L. Finishes:
 - 1. Manufacturer's standard baked-enamel paint for the following:
 - a. Exterior of cabinet, door, and trim, except for those surfaces indicated to receive another finish.
 - b. Interior of cabinet and door.
 - 2. Aluminum: Clear anodic.

2.5 MOUNTING BRACKETS

- A. Available Manufacturers:
 - 1. Buckeye Fire Equipment Company.
 - 2. JL Industries, Inc.
 - 3. Larsen's Manufacturing Company.

- B. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
 - 1. Color: Red.
- C. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
 - 1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
 - a. Orientation: Horizontal.

2.6 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
 - 1. Weld joints and grind smooth.
 - 2. Construct fire-rated cabinets with double walls fabricated from 0.0428-inch- (1.1-mm-) thick, cold-rolled steel sheet lined with minimum 5/8-inch- (16-mm-) thick, fire-barrier material.
 - a. Provide factory-drilled mounting holes.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
 - 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
 - 2. Miter and weld perimeter door frames.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.7 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish fire-protection cabinets after assembly.
- D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

2.9 STEEL FINISHES

- A. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond using manufacturer's standard methods.
- B. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of **2 mils (0.05 mm)**.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where **[semirecessed]** cabinets will be installed.
- B. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged units.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire-protection specialties in locations and at mounting heights indicated or, if not indicated, at heights indicated below:
 - 1. Fire-Protection Cabinets: **54 inches (1372 mm)** above finished floor to top of cabinet.
 - 2. Mounting Brackets: **54 inches (1372 mm)** above finished floor to top of fire extinguisher.

- B. Fire-Protection Cabinets: Fasten fire-protection cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semirecessed fire-protection cabinets.
 - 2. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.
- D. Identification: Apply vinyl lettering at locations indicated.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection specialties are installed, unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet manufacturer.
- E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10520

10538 – ALUMINUM CANOPIES

PART 1 GENERAL

1.01 Quality Assurance

A. Design Criteria

1. Thermal Movement: Completed canopy systems capable of withstanding expansion and contraction of components caused by temperature range from -10 degree to +150 degree F without buckling, excess stress on framing structure or adjacent structures anchors and fasteners.
2. Structural Performance:
 - a. Complete canopy system shall withstand wind loading and uplift requirements as required by Metropolitan Dade County Building Code and must be approved by Dade County.
 - b. Maximum allowable deflection of frame: U240
3. Anchors: Capable of transmitting design loads and thermal expansion loads assigned to single anchor: with safety factor of 2.5.

1.02 Submittals

- A. General: In compliance with Section 01300 and as specified herein.
- B. Shop Drawings: Show canopy in elevation and plan with sections and details at full scale. Include metal thickness, joining details, field connections, anchorage, provisions for expansion, fastening and sealing methods and metal finishes. Indicate relationships with adjacent and interfacing work.
- C. Product Data: Include full system and material description. Finish and installation instructions.
- D. Samples:
 1. Submit minimum 1-0" length of typical beam, fascia and decking components.
 2. Submit minimum 6" x 6" inch samples, finished as specified, indicating range of finish color and texture to be expected in finished work.
- E. Maintenance Data: Submit in compliance with Section 01700. Give instructions for general maintenance and repair of surfaces and finishes.
- F. Certification: Metropolitan Dade County Code Compliance Office approval.

1.03 Deliver, Storage and Handling

- A. Do not deliver canopy units to site until time for installation.
- B. Erect canopy units following completion of adjacent construction.
- C. Protect materials from physical damage, staining or other harm to material or finish.

1.04 Warranty

- A. Contractor guarantees and warrants Work of this section to be in compliance with Contract Documents and free from faults and defects in materials and workmanship for prior of two years from Date of Substantial Completion. Warranty includes prompt repair at no additional cost to Owner. Use warranty form provided in Division One of this Project Manual.

PART 2 – PRODUCTS

2.01 Manufacturer/Materials

- A. Canopy: AEICOR Aluminum Products, Inc
Perfection Architectural Systems
Nelson Adams
Dittmer Architectural Aluminum
 - 1. Framing members: minimum 2" x 2" x 1/8" aluminum tube.
 - 2. Clips and angles: minimum 1/8" thick aluminum.
 - 3. Gutter: 0.050" thick aluminum. Rolled formed 6 inch deep fascia/gutter with case aluminum corners.
 - 4. Soffit panels. 0.032 inch thick aluminum roll formed "Structural W-Panel".
 - 5. Fasteners: Stainless steel finish to match canopy.
 - 6. Finishes: Clear Anodized AA-M-10C-22A-31. Architectural Class II, comply with AAMA607.1.
- B. Scupper: Provide drainage of gutters through scuppers in the bottom of outboard line of gutter. Scuppers to be a minimum of 3 per section at overhead doors.

2.02 Fabrication

- A. Form work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges of radius of approximately 1/32 inch. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work. Perform fabrication work prior to anodizing.
- B. Form profiles without waves or buckling in metal surfaces. Form glazing battens continuous.
- C. Provide anchorage and superstructure of type shown on approved Shop Drawings and coordinated with supporting steel structure. Fabricate and space anchoring devices as indicated.
- D. Fabricate all flashings, closures and similar components as shown.

PART 3 – EXECUTION

3.01 Preparation

- A. Verify location and alignment of preset anchors. Report deviations and proposed method for correction to Architect prior to proceeding.
- B. Provide anchorage devices and fasteners for securing items to in-place construction, including threaded fasteners for concrete inserts. Anchor bolts and erection bolts of types and sizes indicated on approved Shop Drawings.
- C. Set work in location, alignment, and elevation, plumb and level within specified tolerances, true and free of rack: measured from established lines and levels. Install work in compliance with approved Shop Drawings.
- D. Protect components from contact with dissimilar materials by separating with concealed neoprene gaskets or bituminous coating. Protect finishes from damage or scratching during installation.
- E. Provide connections as indicated on approved Shop Drawings. Join dissimilar metal by bolting. Separate dissimilar metals.

3.02 Cleaning

- A. Cleaning: Maintain canopy assembly in reasonable clean condition during construction period. Immediately remove stains or materials having adverse effect on materials and finish. Remove excess glazing and sealant compounds.
- B. Final Cleaning: Just prior to Date of Substantial Completion clean entire canopy assembly using pretested detergent and water. Flush with clean water. Repair or replace work which cannot be cleaned, or which has been damaged during construction operations.

END OF SECTION 10538

SECTION 12355 - INSTITUTIONAL CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Plastic-laminate-faced wood cabinets of stock design.
 - 2. Plastic-laminate countertops.
 - 3. Wall shelving.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for wood blocking for anchoring institutional casework.
 - 2. Division 9 Section "Gypsum Board Assemblies" for reinforcements in gypsum board partitions for anchoring institutional casework.

1.3 DEFINITIONS

- A. Exposed Portions of Cabinets: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than **48 inches (1220 mm)** above floor, and surfaces visible in open cabinets.
- B. Semiexposed Portions of Cabinets: Surfaces behind opaque doors, such as interiors of cabinets, shelves, dividers, interiors and sides of drawers, and interior faces of doors. Tops of cases **78 inches (1980 mm)** or more above floor are defined as semiexposed.
- C. Concealed Portions of Cabinets: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, and ends and backs that are placed directly against walls or other cabinets.

1.4 SUBMITTALS

- A. Shop Drawings: Shop Drawings: Submit Shop Drawings in accordance with Section 01300.
 - 1. Indicate quality grade, materials, species, construction, sizes, shapes, quantities, locations and conditions of adjoining work.
 - 2. Indicate items in related or dimensional position with sections or details shown either full size or 3" = 1'-0" scale.
 - 3. Indicate required field measurements beyond control of mill.
 - 4. Indicate the allowable uniformly distributed loads for shelving.
- B. Samples: Submit manufacturer's full range of sample colors, textures and patterns of plastic laminate for Architect's selection.

- C. Installation Instruction: Provide installation instructions and lists of replacement parts for all hardware and accessories.
- D. Product Data: Provide product data for all hardware and accessories.
- E. Key Schedule: Provide lock and key schedule for lockable cabinets. Coordinate key schedule with Section 08710 Builders Hardware.
- F. Certification: Submit certifications by treating plant that pressure treatment materials comply with governing ordinances.
- G. Samples for Initial Selection: For cabinet finishes and for each type of top material indicated.
- H. Samples for Verification: **6-inch- (150-mm-)** square Samples for each type of finish, including top material and the following:
 - 1. Section of countertop showing top, front edge, and backsplash construction.
 - 2. One full-size finished base cabinet complete with hardware, doors, and drawers, but without countertop.
 - 3. One full-size finished wall cabinet complete with hardware, doors, and adjustable shelves.
 - 4. Maintain full-size Samples at Project site during construction in an undisturbed condition as a standard for judging the completed Work. Unless otherwise indicated, approved sample units may become part of the completed Work if in undisturbed condition at time of Substantial Completion. Notify Architect of their exact locations.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative of institutional casework manufacturer for installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain institutional casework through one source from a single manufacturer.
- C. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards," Section 1600.
 - 1. Provide AWI Quality Certification Program labels indicating that institutional casework complies with requirements.
- D. Product Designations: Drawings indicate sizes, configurations, and finish material of institutional casework by referencing designated manufacturer's catalog numbers. Other manufacturers' casework of similar sizes and door and drawer configurations, of same finish material, and complying with the Specifications may be considered. Refer to Division 1 Section "Product Requirements."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver institutional casework only after painting, utility roughing-in, and similar operations that could damage, soil, or deteriorate casework have been completed in installation areas. If casework must be stored in other than installation areas, store only in areas where environmental conditions meet requirements specified in "Project Conditions" Article.
- B. Keep finished surfaces covered with polyethylene film or other protective covering during handling and installation.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install institutional casework until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where institutional casework is indicated to fit to other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 MOCK-UP

- A. Provide full size base cabinet and upper cabinet of each counter type indicated, in specified finish with hardware installed.
- B. Units will be examined to ascertain quality and conformity to AWI Standards.
- C. Units will establish a minimum standard of quality for this work.
- D. Approved units may be used as part of the work provided units have not been damaged in the submittal process.

1.9 FIELD MEASUREMENTS

- A. Design and fabricate units based upon field conditions and measurements. Verify field measurements are included in shop drawings

1.10 COORDINATION

- A. Coordinate layout and installation of metal framing and reinforcements in gypsum board assemblies for support of institutional casework.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of institutional casework that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
 - 1. Delamination of components or other failures of glue bond.
 - 2. Warping of components.
 - 3. Failure of operating hardware.
 - 4. Deterioration of finishes.
- B. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Plastic-Laminate-Faced Institutional Casework:
 - a. Architectural Cabinet Systems; Division of Windham Millwork, Inc.
 - b. LSI Corporation of America, Inc.
 - c. TMI Systems Design Corp.
 - d. Stevens Industries Inc.
 2. Plastic-Laminate Material:
 - a. Wilsonart
 - b. Formica
 - c. Nevamar

2.2 MATERIALS

- A. Low-Emitting Materials: Fabricate manufactured wood casework, including countertops, with adhesives and composite wood products containing no urea formaldehyde.
- B. General:
1. Adhesives: Do not use adhesives that contain urea formaldehyde.
 2. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
 3. Hardwood Plywood: HPVA HP-1, either veneer core or particle core, unless otherwise indicated, made without urea formaldehyde.
 4. Softwood Plywood: DOC PS 1.
 5. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
 6. Medium-Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue.
 7. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.
 8. Edgebanding for Plastic Laminate: Rigid PVC T-molding, through color with satin finish.
- C. Exposed Cabinet Materials:
1. Solid Wood: Clear hardwood lumber, selected for compatible grain and color.
 2. Plywood: Hardwood plywood, selected for compatible color and grain. Grade AA exposed faces at least **1/50 inch (0.5 mm)** thick, and Grade J crossbands. Provide both faces of same species.
 3. Plastic Laminate: Type VGS.
 - a. Unless otherwise indicated, provide plastic laminate for exposed surfaces.
- D. Semiexposed Cabinet Materials:
1. Plywood: Hardwood plywood of any species similar in color and grain to exposed plywood. Semiexposed backs of plywood with exposed faces shall be same species as faces. Grade B faces and Grade J crossbands.

2. Plastic Laminate: Type VGS.
 - a. Provide plastic laminate for semiexposed surfaces, unless otherwise indicated,.
 - b. Provide plastic laminate for interior faces of doors and drawer fronts and where indicated.

E. Concealed Cabinet Materials:

1. Solid Wood: Any hardwood or softwood species, with no defects affecting strength or utility.
2. Plywood: Hardwood plywood. Concealed backs of plywood with exposed or semiexposed faces shall be same species as faces.
3. Plastic Laminate: Type BKL.

2.3 DESIGN, COLOR, AND FINISH

A. Design: Provide institutional casework of the following design:

1. Reveal overlay with wire pulls.

B. Wood Colors and Finishes: As selected by Architect from casework manufacturer's full range.

C. Plastic-Laminate Colors and Finishes: As indicated by manufacturer's designations.

D. Plastic-Laminate Colors, Patterns, and Finishes: As selected by Architect from plastic-laminate manufacturer's full range.

2.4 CABINET FABRICATION

A. If referencing a quality standard in "Quality Assurance" Article, delete paragraphs and subparagraphs in this Article that duplicate or conflict with the referenced quality standard.

B. Sub-base Material: $\frac{3}{4}$ " thick, 9-ply closed-grain hardwood plywood typical unless noted otherwise. $\frac{1}{4}$ " thick hardwood plywood at cabinet backs and drawer bottoms.

C. Adhesive: Type II, CS 35 or as recommended by plastic laminate manufacturer.

D. Plastic Laminate: High pressure laminate, General Purpose Grade, NEMA LD3, GP-50.

- a. Exposed horizontal surfaces: .050" thick, matte finish.

- b. Exposed vertical surfaces: .030" thick, matte finish.

- c. BK 20 for concealed backing: .020" thick, matte finish, vertical grade, white unless otherwise indicated.

E. Accessories: Adhesives, concealed fasteners, nuts, bolts, screws, pins, washers, etc. of type and size to suit application and severity of use. Provide finished grommets for holes and cut-outs

F. Miscellaneous: Provide shims, blocking, etc. as required for complete installation
Leg Shoes: Vinyl or rubber, black, open-bottom type.

- G. Base Molding: ASTM F 1861, Type TS (rubber, vulcanized thermoset), black, 4 inches (100 mm) high. Provide on fronts and exposed sides of floor-mounted casework.
 - a. Style: A, straight with no toe.
- H. Filler Strips: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets.

2.5 CASEWORK HARDWARE

- A. Hardware, General: Provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware complying with requirements indicated.
 - 1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.
- B. Butt Hinges: Chrome-plated, semiconcealed, 5-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide 2 hinges for doors less than 48 inches (1220 mm) high and 3 hinges for doors more than 48 inches (1220 mm) high.
- C. Pulls: Solid or chrome-plated brass wire pulls, fastened from back with two screws. For sliding doors, provide recessed chrome-plated flush-pulls. Provide 2 pulls for drawers more than 24 inches (600 mm) wide.
- D. Pulls: Semirecessed plastic pulls. For sliding doors, provide recessed plastic flush-pulls. Provide 2 pulls for drawers more than 24 inches (600 mm) wide.
- E. Door Catches: Zinc-plated, nylon-roller spring catch or dual, self-aligning, permanent magnet catch. Provide 2 catches on doors more than 48 inches (1220 mm) high.
- F. Drawer Slides: Zinc-plated, metal-channel, self-closing drawer slides, designed to prevent rebound when drawers are closed, with nylon-tired, ball-bearing rollers, and complying with BHMA A156.9, Type B05091, and rated for the following loads:
 - 1. Box Drawer Slides: 100 lbf (440 N).
 - 2. File Drawer Slides: 150 lbf (670 N).
- G. Adjustable Shelf Supports: 2-pin locking plastic shelf rests complying with BHMA A156.9, Type B04013.
- H. Countertop Support Brackets: The Gambas Co. Size and mounting style as required by design (white peal).
- I. Silencers: Neoprene type with self-adhesive at all cabinet doors.
- J. Gromets where required by design:
 - 1. Gromets 3-inch diameter plastic inserts.

2.6 COUNTERTOPS

- A. Countertops, General: Provide smooth, clean exposed tops and edges in uniform plane free of defects. Provide front and end overhang of **1 inch (25 mm)** over base cabinets.
- B. Plastic-Laminate Tops: Plastic-laminate sheet, shop bonded with waterproof glue to both sides of **3/4-inch (19-mm)** plywood or particleboard. Sand surfaces to which plastic laminate is to be bonded.
 - 1. Plastic-Laminate Type for Flat Tops: HGS.
 - 2. Plastic-Laminate Type for Backing: BKL.
 - 3. Provide plastic-laminate edgings of the same material as top 3-mm PVC edging on front edge of top, on top edges of backsplashes and end splashes, and on ends of tops and splashes.
 - 4. Use exterior plywood or phenolic-resin-bonded particleboard for countertops containing sinks.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of institutional casework.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CASEWORK INSTALLATION

- A. Install plumb, level, and true; shim as required, using concealed shims. Where institutional casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- B. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within **1/16 inch (1.5 mm)** of a single plane. Fasten cabinets to partition framing, wood blocking, or reinforcements in partitions with fasteners spaced **24 inches (600 mm)** o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of **1/16 inch (1.5 mm)**.
 - 1. Where base cabinets are not installed adjacent to walls, fasten to floor at toe space with fasteners spaced **24 inches (600 mm)** o.c. Secure sides of cabinets to floor, where they do not adjoin other cabinets, with not less than two fasteners.
- C. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within **1/16 inch (1.5 mm)** of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Align similar adjoining doors to a tolerance of **1/16 inch (1.5 mm)**.
- D. Install hardware uniformly and precisely. Set hinges snug and flat in mortises, unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.
- E. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF TOPS

- A. Field Jointing: Where possible make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
 - 1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within **6 inches (150 mm)** of front and back edges and at intervals not exceeding **24 inches (600 mm)**. Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
- B. Secure tops to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each front, end, and back.
- C. Abut top and edge surfaces in one true plane, with internal supports placed to prevent deflection.
- D. Secure backsplashes to tops with concealed metal brackets at **16 inches (400 mm)** o.c. and walls with adhesive.
- E. Seal junctures of top, splash, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.4 CLEANING AND PROTECTING

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- C. Protection: Provide **6-mil (0.15-mm)** plastic or other suitable water-resistant covering over countertop surfaces. Tape to underside of countertop at a minimum of **48 inches (1220 mm)** o.c. Remove protection at Substantial Completion.

END OF SECTION 12355