

2. Protect surface from excess evaporation of surface moisture.
3. Protect concrete fill from damage due to impact, overloading, or marring of surfaces during curing period.

3.04 FIELD QUALITY CONTROL

- A. Tests:
1. Testing Laboratory shall perform wet density samplings conforming to ASTM C138. Adjust mixture and mixing procedures according to field sampling information.

3.05 PROTECTION

- A. Prevent surface traffic from concrete surface for a period of 3 days.

END OF SECTION 03 30 53

SECTION 053100 - STEEL DECKING

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. Noncomposite form deck.
- B. Related Requirements:
 - 1. Section 03 30 53 "Structural Lightweight Concrete" for lightweight concrete fill over steel deck.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation, if exterior application.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

2.2 NONCOMPOSITE FORM DECK

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

1. ASC Profiles, Inc.; a Blue Scope Steel company.
2. Canam United States; Canam Group Inc.
3. CMC Joist & Deck.
4. Consolidated Systems, Inc.; Metal Dek Group.
5. Cordeck.
6. DACS, Inc.
7. Marlyn Steel Decks, Inc.
8. New Millennium Building Systems, LLC.
9. Nucor Corp.; Vulcraft Group.
10. Roof Deck, Inc.
11. Valley Joist; Subsidiary of EBSCO Industries, Inc.
12. Verco Manufacturing Co.
13. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.
14. Approved equal.

- B. Noncomposite Form Deck: Fabricate ribbed-steel sheet noncomposite form-deck panels to comply with "SDI Specifications and Commentary for Noncomposite Steel Form Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:

1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), G90 (Z275) zinc coating.
2. Profile Depth: 1-1/2 inches (38 mm).
3. Design Uncoated-Steel Thickness: 0.0358 inch (0.91 mm).
4. Span Condition: As indicated.
5. Side Laps: Overlapped or interlocking seam at Contractor's option.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.
- D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- E. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 31 for overhang and slab depth.
- F. Galvanizing Repair Paint: ASTM A 780.
- G. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Locate deck bundles to prevent overloading of supporting members.
- C. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- D. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- E. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- F. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- G. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- H. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 FLOOR-DECK INSTALLATION

- A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of half of the span or 36 inches (914 mm), and as follows:
 - 1. Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:
 - 1. End Joints: Lapped or butted at Contractor's option.

END OF SECTION 05 31 00

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:

1. Miscellaneous metal work as shown on the drawings .
2. Assemblies and connectors necessary to provide a rigid assembly where required by details or conditions, and not otherwise indicated.
3. Framing, supports members, anchors, bolts, shims, fasteners, and other supplementary parts not a part of other items of work, but required to complete installation.
4. Cutting, fitting, drilling and tapping work of this Section to accommodate work of other Sections, and of concrete, masonry or other materials as required for attaching and installing work of this Section.

1.02 REFERENCES

A. American Institute of Steel Construction:

1. AISC Specifications for Design, Fabrication and Erection of Structural Steel for Buildings.
2. AISC Code of Standard Practice
3. AISC Manual of Steel Construction

B. American Iron and Steel Institute:

1. AISI Steel Products Manual

C. American Welding Society:

1. AWS Structural Welding Code
2. AWS Specifications for Welding Rods and Bare Electrodes

D. Industrial Fasteners Institute:

1. IFS Handbook on Bolt, Nut, and Rivet Standards

1.03 SUBMITTALS

A. Product Data:

1. Submit manufacturer's literature describing products to be provided.

B. Shop Drawings:

1. Submit scaled shop drawings showing general layout, jointing, anchoring sizes and types, shapes, thickness, and other similar detailed information necessary to fully describe fabrication and installation.
2. Shop drawings for fabrication and erection of miscellaneous metal fabrications shall include plans, elevations at not less than 1" to 1'-0" scale and details of sections and connections at not less than 3" to 1'-0" scale. Provide templates for anchor and bolt installation by others.
3. Welding shall be indicated on shop drawings using AWS symbols and showing length, size and spacing (if not continuous). Auxiliary views shall be shown to clarify welding. Notes such as *1/4" weld*, *weld*, *tack weld* are not acceptable.

4. Where materials or fabrications are indicated or required to comply with performance requirements for structural adequacy, shop drawings and structural calculations shall be prepared by and bear seal of a professional engineer registered in jurisdiction in which Project is located.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements:
 1. Work of this Section shall be subject to requirements of applicable portions of following standards:
 - a. AISC Manual of Steel Construction
 - b. AWS D1-1 Structural Welding Code
- B. Design Requirements:
 1. Work of this Section shall comply with all applicable codes for design loading requirements.

1.05 PROJECT CONDITIONS

- A. Field Measurements:
 1. Take field measurements prior to preparation of shop drawings and fabrication, where possible. Allow for trimming and fitting when taking field measurements.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Miscellaneous Steel:
 1. Steel Plates, Shapes, and Bars: ASTM A36
 2. Square Steel Tubing:
 - a. Cold-Formed: ASTM A500
 - b. Hot Rolled: ASTM A501
 3. Steel Pipe: ASTM A53
 - a. Type and Grade: Fabricator's option as required for design loading
 - b. Finish: Black, unless galvanized is indicated
 - c. Weight: Schedule 40, unless otherwise indicated
 4. Galvanized Steel Sheet: ASTM A446, of grade required for design loading.
 - a. Coating Designation: G90, unless otherwise indicated
 5. Sheets for Cold-forming: ASTM A569 and ASTM A568, hot-rolled steel of commercial quality, pickled and oiled, free of defects which would impair work.
 6. Gray Iron Castings: ASTM A48, Class 30
 7. Malleable Iron Castings: ASTM A47, grade at fabricator's option
- B. Shop Paint: Rust-inhibitive primer
 1. Specifications:
 - a. FS TT-P-641G(1)
 - b. FS TT-P-645A
 - c. SSPC 25, Red Iron Oxide, Zinc Oxide, Raw Linseed Oil & Alkyd Primer

2.02 COMPONENTS

- A. Metal Pan Stairs:
 1. Stringers: As shown on the drawings
 2. Treads: 14 gauge steel plate formed pans (for filling with concrete)
 3. Seat Angles: 1 1/4" x 1 1/4" x 1/8"
 4. Risers: 14 gauge steel plate
 5. Landing Pans: 14 gauge steel plate formed pans (for filling with concrete)

- B. Vanity and counter supports as required or unless otherwise noted on the drawings:
 - 1. Framing Member:
 - a. Front Support: 3/4" x 3" galvanized steel bar
 - b. Ledger and intermediate support angles: 3" x 2" x 1/4" galvanized steel
 - 2. Column Supports: 2" x 2" galvanized tube column

2.03 ACCESSORIES

- A. Fasteners:
 - 1. Comply with IFS Handbook on Bolt, Nut, and Rivet Standards and standards as follows:
 - a. Bolts and Nuts: Regular hexagon head type, ASTM A307, Grade A.
 - b. Machine Screws: Cadmium plated steel, FS FF-S-92B
 - c. Expansion Bolts: Toothed steel or lead shield expansion devices with galvanized bolts; except do not use lead shield bolts for overhead work.

2.04 FABRICATION

- A. General Requirements:
 - 1. Fabricate miscellaneous units to sizes, shapes and profiles as required to receive adjacent other work to be retained by framing.
 - 2. For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or welding and grinding, prior to cleaning, treating and application of finishes including zinc coatings.
 - 3. Weld corners and seams continuously, complying with American Welding Society recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
 - 4. Provide for anchorage as required, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
 - 5. Pre-assemble items in shop to greatest possible extent possible to minimize field splicing and assembly.
 - 6. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.
 - 7. Cut, reinforce, drill and tap miscellaneous metal work to receive finish hardware and similar items.
 - 8. Furnish inserts and anchoring devices which must be set in other work as required for installation of miscellaneous metals work.
- B. Metal Pan Stairs:
 - 1. Fabricate stairs and landings with closed risers and treads of metal pan construction, ready to receive concrete.
 - 2. Fabricate treads and risers with bent nosings and closed ends. Secure tread pans to stringers with clip angles, welded in place. Risers shall be welded to stringers.
 - 3. Reinforce underside of landings with angles or metal T's to attain design load requirements.
- C. Shop Painting:
 - 1. Paint metal fabrications in shop prior to delivery to Site. Coat surfaces, inside and out, whether exposed or concealed in construction.
 - 2. Clean steel and wrought iron work to remove loose mill scale and rust.
 - 3. Apply shop paint as soon as possible after cleaning to surfaces. Provide smooth, uniform dry film thickness of 2.0 mils.

PART 3 - EXECUTION

3.01 EXAMINATION METAL FABRICATIONS

05 50 00-3

- A. Verification of Conditions:
 - 1. Field check and verify that structural framing, enclosures, weld plates, blocking, size and location of pockets are as indicated on accepted shop drawings.
 - 2. Do not proceed until discrepancies have been corrected.

3.02 INSTALLATION

- A. General Requirements:
 - 1. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction.
 - 2. Anchor securely as shown or as required for intended use, using concealed anchors wherever possible. Use powder driven anchors only with specific permission of Contractor's Safety Superintendent.
 - 3. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
 - 4. Fit exposed connections accurately together to form tight hairline joints.
 - 5. Provide ventilation to areas where field welding is done. Ventilation shall be sufficient to prevent setting off alarm systems.
- B. Metal Pan Stairs:
 - 1. Do not proceed with installation until stairwell is cleared.
 - 2. Erect stairs square, plumb, straight, true to line and level, with neatly fitted joints and intersections. Installation shall be secure and rigid.

3.03 ADJUSTING

- A. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Paint damaged areas with same material as used for shop painting. Provide a minimum dry film thickness of 2.0 mils.

END OF SECTION 05 50 00

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included: Rough carpentry as shown on the drawings.

1.02 QUALITY ASSURANCE

A. Grade Marks:

1. Lumber grade mark stamps shall contain following:
 - a. Symbol of grading agency certified by Board of Review of American Lumber Standards Committee
 - b. Mill number or name
 - c. Grade of lumber
 - d. Species or species grouping or combination designation
 - e. Rules under which graded were applicable
 - f. Condition of seasoning at time of manufacture
 - i) S-GRN: Unseasoned
 - ii) S-DRY: Maximum Moisture Content 19%
 - iii) MC-15 or KD: Maximum Moisture Content 15%

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Lumber: PS-20; graded in accordance with established Grading Rules.
1. Maximum Moisture Content: 19%
 2. Lumber shall be S4S dressed, unless otherwise indicated.
- B. Plywood: PS 1; bearing grade trademark of American Plywood Association.
- C. Treated Wood:
1. Fire Retardant Treatment:
 - a. Provide materials which comply with UL surface burning characteristics, Type A in accordance with requirements of AWPA Standards C20 for lumber and C27 for plywood and kiln dried after treatment KDAT as a minimum.
 - b. Fire retardant chemical shall be free of halogens, sulfates, ammonium phosphate, and formaldehyde and shall be registered for use as a wood preservative by U.S. Environmental Protection Agency.
 - c. Flame spread rating shall be not more than 25, when tested by ASTM E84 with no increase in flame spread and significant progressive combustion upon continuation of test for an additional 20 minutes.
 - d. Fire retardant lumber and plywood shall have an Underwriter's Laboratory stamp FR-S.
 - e. Lumber shall be kiln dried to a maximum moisture content of 19% after treatment, and plywood redried to a maximum moisture content of 15% after treatment.
 - f. Fire retardant treated wood shall have an equilibrium moisture content of not more than 25% when tested in accordance with ASTM D3201 at 95% relative humidity.
 2. Preservative Treatment:
 - a. Provide materials which comply with requirements of AWPA LP-2 as a minimum.
- D. Fasteners:

1. Fasteners shall be sized to suit application; galvanized for exterior locations, high humidity locations, and with treated wood. Plain finish shall be provided for other interior locations.
2. Toggle bolt type for anchorage to hollow masonry.
3. Expansion shield and lag bolt type shall be used for anchorage to solid masonry or concrete.
4. Bolts or power activated type for anchorage to steel.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General Requirements:

1. Provide wood blocking for anchorage of other materials. Form to shapes and sizes as indicated or as may be required to accomplish a particular installation. Form blocking of minimum 2" nominal thickness material.
2. Coordinate location of blocking for all surface mounted items such as equipment (TVs), wall cabinets, shelving, door stops, handrail brackets, coat hooks, wall bumpers, etc..
3. On members that are to receive an applied finish surface, align subsurface to vary not more than 1/8" from plane of adjacent members.
4. Fasten parts of rough carpentry work securely in their proper place. Frame openings and provide blocking for work of other trades.
5. Size wood before treatment to minimize cutting after treatment.

B. Treated Wood:

1. Fire retardant treated wood is required where used as blocking in fire rated partitions, or when part of other fire rated assemblies.
2. Provide preservative treated permanent wood grounds and temporary wood grounds for proper execution of work of all trades. Remove temporary grounds when they are no longer required.
3. Wood used in following areas shall be preservative treated:
 - a. Wood in contact with earth, concrete, plaster, masonry, or steel.
 - b. Wood used for sills, screeds, cant strips, plates, blocking, gravel stops, nailers, and bucks.
4. Do not rip or mill fire retardant treated lumber unless specifically allowed by manufacturer. Only end cuts, drilling holes and joining cuts shall be permitted.

C. Fasteners:

1. Securely attach rough carpentry work to substrate by anchoring and fastening as required by recognized standards. Countersink bolt heads.
2. Select fasteners of a size that will not penetrate members where opposite side will be exposed to view in finished Work, or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

END OF SECTION 06 10 00

SECTION 06 40 00 - ARCHITECTURAL WOODWORK

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; all of which may not be indicated or required in the Contract Documents.
 1. Plastic-laminate cabinets.
 2. Plastic-laminate countertops.
 3. Solid Surfacing countertops
 4. Closet and utility shelving.

1.3 DEFINITIONS

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated, including cabinet hardware and accessories and finishing materials and processes. Submit literature for specialty items not manufactured by architectural woodworker including, but not limited to, stand offs, reveals, metal inserts, spacers, etc.
- B. Shop Drawings:
 1. Shop drawings of woodwork items shall include AWI quality grade construction, key plan showing location of items, dimensioned plans, elevations, vertical sections, plan sections, profiles of trim and moldings, and details.
 2. Show reveals, joinery, anchoring to adjacent construction, shapes, thickness, wood species, cut, veneer matching, grain direction, and other similar detailed information to fully describe fabrication, finishing, and installation.
 3. Shop drawings shall be of sufficient detail and scale to determine compliance with intent of quality grades specified.
 4. Casework shop drawings shall indicate:
 - a. Construction, cabinet style
 - b. Tops, edges, and splashes
 - c. Scribing and fillers
 - d. Finish for each area
 - e. Decorative laminate selection
 - f. Hardware

- C. Samples for Verification:
 - 1. Veneer-faced panel products with or for transparent finish, 8 by 10 inches, for each species and cut. Include at least one face-veneer seam and finish as specified.
 - 2. Lumber and panel products with shop-applied opaque finish, 50 sq. in. for lumber and 8 by 10 inches for panels, for each finish system and color, with 1/2 of exposed surface finished.
 - 3. Plastic laminates, 8 by 10 inches, for each type, color, pattern, and surface finish, with 1 sample applied to core material and specified edge material applied to 1 edge.
 - 4. Exposed cabinet hardware and accessories, one unit for each type and finish.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Certified participant in AWI's Quality Certification Program.
- B. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with sequence-matched wood veneers.
- C. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
 - 1. Provide AWI Quality Certification Program certificates indicating that woodwork complies with requirements of grades specified.
- D. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork 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. 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 and relative humidity between 17 and 50 percent during the remainder of the construction period.
- C. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.

1.8 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.
- B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Division 8 Section "Door Hardware (Scheduled by Describing Products) " to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Species and Cut for Transparent Finish: See Appendix A.
- C. Wood Species for Opaque Finish: Close Grained Hardwood.
- D. Wood Products: Comply with the following:
 - 1. Hardboard: AHA A135.4.
 - 2. Medium-Density Fiberboard: ANSI A208.2, Grade MD,
 - 3. Particleboard: Straw-based particleboard complying with requirements in ANSI A208.1, Grade M-2, except for density.
 - 4. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.
- E. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
 - 1. Provide PVC or polyester edge banding complying with LMA EDG-1 on components with exposed or semi exposed edges.
- F. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

2.2 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this Article, which are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified.
 - 1. Do not use treated materials that do not comply with requirements of referenced woodworking standard or that are warped, discolored, or otherwise defective.
 - 2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
 - 3. Identify fire-retardant-treated materials with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Fire-Retardant Particleboard: Panels complying with the following requirements, made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 25 or less per ASTM E 84.

1. For panels 3/4 inch thick and less, comply with ANSI A208.1 for Grade M-2 except for the following minimum properties: modulus of rupture, 1600 psi; modulus of elasticity, 300,000 psi; internal bond, 80 psi; and screw-holding capacity on face and edge, 250 and 225 lbf, respectively.

2.3 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section "Door Hardware."
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.
- D. Shelf Rests: BHMA A156.9, B04013; metal.
- E. Drawer Slides: BHMA A156.9, B05091.
 1. Standard Duty (Grade 1, Grade 2, and Grade 3): Side mounted and extending under bottom edge of drawer; full-extension type; zinc-plated steel with polymer rollers.
 2. Box Drawer Slides: Grade 1; for drawers not more than 6 inches high and 24 inches wide.
 3. File Drawer Slides: Grade 1HD-100; for drawers more than 6 inches high or 24 inches wide.
 4. Trash Bin Slides: Grade 1HD-100; for trash bins not more than 20 inches high and 16 inches wide.
- F. Grommets for Cable Passage through Countertops: 1-1/4-inch OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.
- G. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 1. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
- H. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.4 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.5 FABRICATION, GENERAL

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- B. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.

- D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- E. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

2.6 PLASTIC-LAMINATE CABINETS

- A. Grade: Custom.
- B. AWI Type of Cabinet Construction: Flush overlay.
- C. Laminate Cladding for Exposed Surfaces including edges: High-pressure decorative laminate – see Appendix A
- D. Materials for Semi exposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies: Thermoset decorative panels
 - 2. Drawer Sides and Backs: Thermoset decorative panels.
 - 3. Drawer Bottoms: Thermoset decorative panels.
- E. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.
- F. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. See Appendix A

2.7 PLASTIC-LAMINATE COUNTERTOPS / SOLID SURFACING COUNTERTOPS

- A. Grade: Custom.
- B. See Appendix A

2.8 CLOSET AND UTILITY SHELVING

- A. Grade: Custom.
- B. Shelf Material: 3/4-inch thermoset decorative panel with solid-lumber edge.
- C. Cleats: 3/4-inch solid lumber.
- D. Wood Species: Match species indicated for other types of transparent-finished architectural woodwork located in same area of building, unless otherwise indicated.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.
- C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.
- D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.
- F. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- G. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - 2. Maintain veneer sequence matching of cabinets with transparent finish.
 - 3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
- H. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - 2. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.
 - 3. Calk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."
- I. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.

- C. Clean woodwork on exposed and semi exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06 40 00

SECTION 07841 - PENETRATION FIRESTOPPING

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 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.
- 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.
 - 3. L-Rated Systems: Where through-penetration firestop systems are indicated in smoke barriers, provide through-penetration firestop systems with L-ratings of not more than 3.0 cfm/sq. ft at both ambient temperatures and 400 deg F.
- 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 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. Through-Penetration Firestop System Schedule: Submit schedule with 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 UL-classified system. Refer to alpha-numeric designations listed in UL's "Fire Resistance Directory" under product Category XHEZ.
- C. Qualification Data: For installer
- D. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.
- 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 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."

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 multi-component 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. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.
- C. 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 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. VOC Content: Provide penetration firestopping that complies with the following limits for VOC content when calculated according to 40 CFR 59, subpart D:
 - 1. Architectural Sealants: 250 g/L
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L
 - 3. Sealant Primers for Porous Substrates: 775 g/L
- C. 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. Temporary forming materials.
 3. Substrate primers.
 4. Collars.
 5. Steel sleeves.

2.2 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.

2.3 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 in concealed locations with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches 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 FIELD QUALITY CONTROL

- A. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.
- B. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.6 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 07 84 13

SECTION 07 92 00 - 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; all of which may not be indicated or required for the Contract Documents.
 - 1. Joint sealants for the applications indicated in the Joint-Sealant Schedule at the end of Part 3.
 - 2. Joint-sealant backing.
 - 3. Miscellaneous material.
- B. Definitions:
 - 1. M: Masonry
 - 2. G: Glass
 - 3. A: Aluminum
 - 4. O: Other
 - 5. T: Traffic
 - 6. NT: Nontraffic
 - 7. M: Multicomponent
 - 8. P: Pourable

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. Shop Drawings: Prepare a sealant schedule describing type, brand, color and location of each sealant to be applied. Submit 3 copies of sealant schedule prior to application.
- 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. Qualification Data: For Installer.

- F. 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. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:
 - 1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

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. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D:
 - 1. Architectural Sealants: 250 g/L
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L
 - 3. Sealant Primers for Porous Substrates: 775 g/L

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 Mildew-Resistant Neutral-Curing Silicone Sealant:
 - 1. Available Products:
 - a. Pecora Corporation; 898.
 - b. Tremco; Tremsil 200.
 - 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.
 - a. Use O Joint Substrates: granite, marble, ceramic tile, solid surface materials and plastic laminate.
- E. Multicomponent Nonsag Urethane Sealant:
 - 1. Available Products:
 - a. Tremco; Dymeric 511.
 - b. Tremco; THC-900/901.
 - c. Tremco; Vulkem 227.
 - d. Pecora Corporation; Dynatred.

2. Type and Grade: M (multicomponent) and NS (nonsag).
3. Class: 50 or less.
4. Uses Related to Exposure: NT (nontraffic) and T (traffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: Color anodic aluminum, aluminum coated with a high-performance coating, granite, marble, ceramic tile and wood

F. Single-Component Nonsag Urethane Sealant:

1. Available Products:
 - a. Tremco; Vulkem 116.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: Color anodic aluminum, aluminum coated with a high-performance coating, granite, marble, ceramic tile and wood.

G. Single-Component Nonsag Urethane Sealant:

1. Available Products:
 - a. Bostik Findley; Chem-Calk 900.
 - b. Pecora Corporation; Dynatrol I-XL.
 - c. Tremco; Vulkem 921.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 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.
 - a. Use O Joint Substrates: Color anodic aluminum, aluminum coated with a high-performance coating, granite, marble, ceramic tile and wood.

2.4 LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.

B. Available Products:

1. Bostik Findley; Chem-Calk 600.
2. Pecora Corporation; AC-20+.
3. Tremco; Tremflex 834.

2.5 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. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing 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.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, 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. Masonry.
 - c. Unglazed surfaces of ceramic and/or quarry tile.
 - d. Dimensional stone

- e. Wood
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. 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.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified 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, as noted.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193, as noted.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 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.

3.5 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.

3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Interior ceramic and dimension stone tile expansion, control, contraction, and isolation joints in horizontal traffic surfaces.
 1. Joint Sealant: Multi-component nonsag urethane sealant.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- B. Joint-Sealant Application: Interior joints between plumbing fixtures and adjoining walls, floors, and counters.
 1. Joint Sealant: Single-component mildew-resistant neutral-curing silicone sealant.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- C. Joint-Sealant Application JS: Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
 1. Joint Sealant: Latex sealant.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION 07 92 00

SECTION 08 12 16 - ALUMINUM FRAMES

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. This Section includes the following:
 - 1. Interior aluminum frames for doors.
 - 2. Interior aluminum frames for sidelights and fixed glass panels.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of interior aluminum frame indicated.
- B. Shop Drawings: For interior aluminum frames. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Maintenance Data: For interior aluminum frames to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of interior aluminum frames and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- B. Fire-Rated Door-Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated.
 - 1. As scheduled on Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for interior aluminum frames is based on the following:
 - 1. Frameworks; Series 2, 1 1/2" Flush Trim in clear anodized finish.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Frameworks Manufacturing, Inc. contact: Scott Rutledge 410-263-1500
 - 2. Custom Components Inc. contact: Jim Blair 800-516-9474
 - 3. Avanti Systems USA. contact: 877.282.6843

2.2 COMPONENTS

- A. Aluminum Framing, General: ASTM B 221 (ASTM B 221M), Alloy 6063-T5 or alloy and temper required to suit structural and finish requirements, not less than 0.062 inch (1.6 mm) thick.
- B. Door Frames: Reinforced for hinges and strikes.
- C. Trim: Extruded aluminum, not less than 0.062 inch (1.6 mm) thick, with removable snap-in casing trim without exposed fasteners.

2.3 ACCESSORIES

- A. Fasteners: Aluminum, nonmagnetic stainless-steel or other noncorrosive metal fasteners compatible with frames, stops, panels, reinforcement plates, hardware, anchors, and other items being fastened.
- B. Sound Seals: Manufacturer's standard continuous mohair, wool pile, or vinyl seals.
- C. Smoke Seals: Intumescent strip or fire-rated gaskets.
- D. Hardware: Comply with requirements in Division 08 door hardware Sections.

2.4 FABRICATION

- A. Machine jambs and prepare for hardware, with concealed reinforcement plates, drilled and tapped as required, and fastened within frame with concealed screws.
- B. Provide concealed corner reinforcements and alignment clips for accurately fitted hairline joints at butted or mitered connections.
- C. Fabricate frames for glazing with recess and gaskets to allow glazing replacement without dismantling frame.
- D. Fabricate all components to allow secure installation without exposed fasteners.

2.5 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.
- C. Class II, Color Anodic Finish: AA-M12C22A32/A34 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, integrally colored or electrolytically deposited color coating 0.010 mm or thicker) complying with AAMA 611.
 - 1. Color: Clear Anodized unless otherwise specified in Appendix A – Schedule of Materials

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls, floors, and ceilings, with Installer present, for conditions affecting performance of work.
 - 1. Verify that wall thickness does not exceed standard tolerances allowed by throat size indicated.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with frame manufacturer's written installation instructions.
- B. Install frames plumb and square, securely anchored to substrates.
- C. Install frame components in the longest possible lengths; components up to 96" long must be 1 piece.
 - 1. Fasten to suspended ceiling grid on maximum 24" centers, using sheet metal screws or other fasteners approved by frame manufacturer.
 - 2. Use concealed installation clips to produce tightly fitted and aligned splices and connections.
 - 3. Secure clips to main structural extrusion components and not to snap-in or trim members.
 - 4. Do not leave screws or other fasteners exposed to view when installation is complete.

3.3 CLEANING

- A. Clean exposed frame surfaces promptly after installation, using cleaning methods recommended by frame manufacturer and according to AAMA 609 & 610.
- B. Touch up marred frame surfaces so touchup is not visible from a distance of 48 inches (1220 mm). Remove and replace frames with damaged finish that cannot be satisfactorily repaired.

END OF SECTION 08 12 16

SECTION 08 14 00 - WOOD DOORS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Solid core wood doors

1.02 REFERENCES

- A. Publications listed herein are part of this specification to extent referenced.
- B. American National Standards Institute:
1. ANSI A117.1 Accessible and Usable Buildings and Facilities
 2. ANSI A151 Series
 3. ANSI A208.1 Particleboard
- C. American Society for Testing and Materials:
1. ASTM D523 Standard Test for Specular Gloss
 2. ASTM D1037 Test Methods for Evaluating the Properties of Wood Base Fiber and Particle Panel Materials
 3. ASTM E152 Methods of Fire Tests of Door Assemblies
- D. Architectural Woodwork Institute:
1. AWI Quality Standards, Guide Specifications
- E. Door and Hardware Institute:
1. DHI Publication - WDHS-3 Recommended Hardware Locations for Wood Flush Doors
- F. National Fire Protection Association:
1. NFPA 80 Fire Doors and Windows
 2. NFPA 101 Life Safety Code
 3. NFPA 105 Recommended Practice for the Installation of Smoke-Control Door Assemblies
 4. NFPA 252 Standard Methods of Fire Tests of Door Assemblies
- G. Window and Door Manufacturers Association:
1. WDMA I.S.1-A Architectural Wood Flush Doors
- H. Underwriter's Laboratories Inc.:
1. UL Standard 10C Fire Tests of Door Assemblies
 2. UL Standard 1784 Air Leakage Tests of Door Assemblies
 3. UL Building Materials Directory

1.03 DEFINITIONS

- A. Trade Terms used in this Specification:
1. ADHESIVE – A substance capable of bonding materials together by surface attachment.
 - a. TYPE I ADHESIVE – Fully waterproof; forms a bond that will retain practically all its strength when occasionally subjected to a thorough wetting and drying. Bond shall be of such quality that specimens will withstand shear and two cycle boil test.
 - b. Type II Adhesive – Water-resistant; forms a bond that will retain practically all its strength when occasionally subjected to a thorough wetting and drying. Bond shall be of such quality that specimens will withstand three cycle cold soak test.
 2. BLENDING - Color change that is detectable at a distance of 6' to 8', but which does not seriously detract from overall appearance of panel.

3. CORE - Innermost layer in veneered construction, normally consisting of several individual wood pieces edge-glued and end-glued together.
4. CROSS-BANDING - A ply placed between core and face veneer in 5-ply construction.
5. GRAIN - Arrangement of wood fibers and pores evident on cut and/or finished wood products. Direction, size, arrangement, and appearance of fibers in wood or veneer. Appearance of grain varies with both species and cut.
6. FACE VENEER - Outermost exposed wood veneer surface of a veneered wood door.
7. FIGURE - Pattern produced, usually across grain, by natural deviations from normal grain.
8. LOCK BLOCK - A concealed block, same thickness as door stile or core, which is adjacent to stile at a location corresponding to lock location and into which a lock is fitted.
9. MEDIUM DENSITY FIBERBOARD (MDF) - Generic name for a panel manufactured from lignocellulosic fibers combined with a synthetic resin or other suitable binder and bonded together under heat and pressure in a hot press by a process in which entire bond is created by added binder.
10. MEDIUM DENSITY OVERLAY (MDO) - A thermosetting resin impregnated paper applied to a door face to provide optimum surface for a paint finish.
11. OPAQUE FINISH – A paint or pigmented stain finish that hides natural characteristics and color of grain of wood surface and is not transparent.
12. ORANGE PEEL - In finishing, slight depressions in surface, similar to skin of an orange.
13. PANEL - FLAT - A single or multi-layered (laminated) panel.
14. PANEL - RAISED - A door panel whose faces are raised above edges that are shaped to fit into grooves in stiles and rails.
15. RAIL - A horizontal structural member of a door.
16. STICKLING - A profile machined in to edges of stiles, rails, mullions, muntins, or bars, adjacent to panels, glazing materials, or louvers.
17. STILE - A vertical member of a door.
18. TRANSPARENT FINISH – A stain or clear finish that allows natural characteristics and color of grain of wood surface to show through finish.

1.04 SUBMITTALS

- A. Product Data:
 1. Submit manufacturer's product data, specifications, and installation requirements for each type of wood door to be provided for use on this Project.
- B. Shop Drawings:
 1. Submit shop drawings and schedules indicating location and size of each door.
 2. Indicate construction details, fire-ratings, elevations, materials, thickness, door swing, stile and rail dimensions, veneers, undercuts, locations of finish hardware by dimension and locations/details of openings and louvers and other pertinent data.
 3. Shop drawings submittal shall be coordinated with shop drawings submission of related portions of Work, such as:
 - a. Hollow metal doors and frames
 - b. Hardware
- C. Samples:
 1. Submit samples for review of color, texture, grain, and finish only. Provide samples in sufficient number to demonstrate full range of grain, color, texture, and finish expected in final work.
 2. Allow for 5 separate submissions of each wood finish for matching control sample provided by Architect.
 3. Fabricate samples using selected flitch.
 4. Solid stock samples shall be profiles and types of woods scheduled.
 5. Samples shall represent, in all respects, minimum quality to be furnished by manufacturer. No work represented by samples shall be fabricated until samples are accepted. Downgrading of quality demonstrated by samples may be cause for rejection.
 6. Submit 2 samples for each wood finish; minimum.
 7. Sample Size:
 - a. Wood Veneer Finishes:

- 1) Transparent Finish: 18" min. width x 30" min. length
- 2) Opaque Finish: 12" x 12"
- b. Solid Stock Trim: 12" lengths

D. Quality Assurance Submittals:

- 1. Test Reports:
 - a. Submit test reports prepared by an independent testing laboratory indicating full compliance with specified requirements for screw withdrawal, split resistance, and hinge loading.
- 2. Certificates:
 - a. Door manufacturer shall provide a letter, signed by an authorized company representative, to Architect stating that doors have been manufactured in compliance with this specification.
- 3. Manufacturer's Instructions:
 - a. Submit manufacturer's installation procedures which shall be basis for accepting or rejecting actual installation procedures.

1.05 QUALITY ASSURANCE

A. Qualifications:

- 1. Door manufacturer shall be a company with a minimum of 5 years of verifiable experience manufacturing wood doors.
- 2. Wood doors shall be five-ply construction, seven-ply construction does not satisfy this specification and shall not be acceptable.
- 3. Single Source Responsibility:
 - a. To greatest extent possible, wood doors shall be products of a single manufacturer.
 - b. Veneers for transparent finishes shall be supplied from a single source.
 - c. Provide secondary materials that are produced or are specifically recommended by manufacturer of wood doors to ensure uniformity of quality and appearance throughout Project.

B. Regulatory Requirements:

- 1. Comply with applicable provisions and recommendations of AWI for materials, fabrication and machining of wood doors.
- 2. Fabrication and installation of fire rated wood doors shall comply with ASTM E152 and National Fire Protection Association (NFPA), Underwriters Laboratories (UL), and Door and Hardware Institute (DHI) provisions or standards listed below.
- 3. National Fire Protection Association:
 - a. NFPA 80 *Standard for Fire Doors and Windows*
 - b. NFPA 101 *Life Safety Code*
 - c. NFPA 105 *Recommended Practice for the Installation of Smoke-Control Door Assemblies*
 - d. NFPA 252 *Standard Methods of Fire Tests of Door Assemblies*
- 4. Underwriters Laboratories Inc.:
 - a. UL Standard 10C *Fire Tests of Door Assemblies*
 - b. UL Standard 1784 *Air Leakage Tests of Door Assemblies*
- 5. Door and Hardware Institute:
 - a. WDHS-3 *Recommended Hardware Locations for Wood Flush Doors*
- 6. Comply with applicable Federal Accessibility Regulations:
 - a. Americans with Disabilities Act - ADA
 - b. Uniform Federal Accessibility Standards - UFAS
 - c. ANSI A117.1 *Standard for Accessible and Usable Buildings and Facilities*

C. Certifications:

- 1. Fire-rated doors and frames shall bear labels by Underwriters Laboratories, Inc., Warnock Hersey International, or other nationally recognized organizations acceptable to authority having

- jurisdiction. Provide fire-rated doors with a label permanently attached to either hinge stile or to top rail, showing testing agency approval for classification scheduled.
2. Door assemblies shall bear fire-rating labels indicating following:
 - a. Hourly fire rating
 - b. Temperature rise developed on unexposed surface after 30 minutes of exposure
 - c. Letter "S" to designate smoke-resistance
 - d. Name and address of listee
 - e. Model number of type
 - f. Symbol, serial or issue number of listing agency
 3. Tops of doors shall bear a label from manufacturer indicating door construction, face veneer species, cut, grade, and finishing information.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading:
 1. Doors shall be individually wrapped in poly bags. Break seals on-site to permit ventilation.
 2. Clearly label each door with opening number where door is scheduled for installation. Use removable, temporary labels or mark on door surface that will be concealed from view after installation.
 - a. Coordinate door identification with shop drawing designations.
 3. Handle doors in a manner to prevent damage to exposed surfaces in compliance with WDMA I.S.1-A, Section G-20 *Care and Installation at Job Site*.
 4. Do not drag doors across one another.
- B. Storage and Protection:
 1. Store doors in a protected, dry area at least 6" (150 mm) off floor.
 2. Stack units so that water cannot accumulate on or within materials, using shims to provide drainage and air circulation.
 3. Protect doors from direct exposure to sunlight.
 4. Avoid subjecting doors to extreme heat, dryness, or moisture.
 5. Doors that have been scratched, or otherwise damaged shall be removed from Site.

1.07 PROJECT CONDITIONS

- A. Environmental Requirements:
 1. Spaces shall be ready to receive wood doors with temperature and humidity controlled to avoid damage by excessive changes in atmospheric conditions. Temperature and humidity shall be stabilized in installation areas at approximate level that will prevail in building when occupied. Relative humidity shall be not less than 30% or more than 60%.

1.08 SPECIAL WARRANTY

- A. Provide manufacturer's written warranty covering cost to repair or replacement of defective materials or workmanship for a periods as indicated below from Date of Substantial Completion. Warranty shall cover defects that render doors unacceptable or unfit for ordinary, recommended use, including, but not limited to delaminating, warping, and core telegraphing through face.
 1. Stile and Rail Wood Doors: Five years
 2. Solid Core Flush Slab Wood Doors: Life of Original Installation
- B. A representative of door manufacturer shall inspect installed doors and shall note on guarantee that no provisions of guarantee have been nullified in manufacture or installation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Flush Slab Doors:
 - 1. Algoma Hardwoods
 - 2. Buell Door Co.
 - 3. Eggers Industries
 - 4. VT Industries
 - 5. Weyerhaeuser Co.

2.02 MATERIALS

- A. Wood Veneer:
 - 1. Wood Species and Cut: Refer to Appendix A - Schedule of Finishes
 - 2. Grade: Grade AA
 - a. Veneer grades shall comply with face veneer characteristics established by Hardwood Plywood & Veneer Association (HPVA) and adapted by Architectural Woodwork Institute (AWI).
 - 4. Thickness: 1/40" minimum at time of cutting
 - 5. Amount of veneer needed shall be based on a ratio of 3 to 1 (raw face veneer to panel surface area).

2.03 WOOD DOORS

- A. Solid Core Doors: Flush slab; AWI 1300
 - 1. Grade: Premium
 - 2. Core Materials:
 - a. Non-Rated: PC-5; Particleboard; ANSI A208.1, Grade 1-LD-2
 - b. Fire Rated: FD-5; Non-combustible mineral core or particle board per label requirements
 - 3. Face Materials:
 - a. Transparent Finish Doors: Wood veneer
 - b. Opaque Finish Doors: MDO or tempered hardboard
 - 4. Sizes: As indicated on drawings
 - 5. U.L. Label Rating: As indicated on Drawings
- B. Stile and Rail Doors: AWI 1400
 - 1. Grade: Premium
 - 2. Type: As indicated on Drawings
 - 3. Solid Stock: Grade II
 - a. Wood Species: Refer to Appendix A - Schedule of Finishes
 - 4. Sizes: As indicated on drawings

2.05 FABRICATION

- A. General Requirements:
 - 1. Wood door manufacturer shall machine doors for cutouts, hinges, locks and hardware needing routing and mortising. Perform rabbeting as needed to properly hang doors prior to finishing.
 - 2. Doors may, at Contractor's option, be completely pre-fitted for all hardware by door manufacturer.
 - 3. Locate items in compliance with Door and Hardware Institute publication WDHS.3 *Recommended Hardware Locations for Wood Flush Doors*. Mounting heights shall be measured from finish floor, except top butt.
 - a. Butts:
 - 1) Top: 9 5/8" center of butt to top of door
 - 2) Intermediate: Equal distance between top and bottom butts
 - 3) Bottom: 10 3/8" to center of butt
 - b. Locksets and Latchsets: 40 5/16" to center of strike
 - c. Deadlocks: 60" to center of strike
 - d. Exit Devices: 40 5/16" to center of strike

- e. Push Plates: 45" to center
 - f. Pull Bars (Grips): 42" to center
 - 4. Wood Veneer: Transparent finish
 - a. Matching of Adjacent Pieces of Veneer: Book match
 - b. Panel Face Assembly: Center-Balance match
 - c. Doors in pairs and sets shall be sequence matched.
 - 5. Blocking: Provide either hardwood or structural composite lumber wood blocking in doors or as required to meet specified fire rating and as follows:
 - a. Top Rail (No Closer): Minimum 1-1/8 inch.
 - b. Top Rail (Closer): Minimum 5-inch remaining after installation. Verify with closer manufacturer.
 - c. Bottom Rail: Minimum 1-1/8 inch after undercut.
 - d. Bottom Rail: 5-inch bottom-rail in doors indicated to have kick, mop, or armor plates.
 - e. Midrail: 5-inch midrail blocking, in doors indicated to have exit devices at location of exit device.
 - 6. Stiles: Provide stiles consisting of two plys.
 - a. The inner-ply shall be minimum 1-1/8 inches Structural Composite Lumber (SCL) or approved non-combustible material on 20 minute rated doors, On 45, 60, and 90 minute rated doors, the inner-ply shall be 1-inch of Structural Composite lumber or approved combustible material.
 - b. The outer ply shall be of hardwood lumber the same species as the face veneer with.
 - c. Veneer tape will not be permitted.
- B. Flush Slab Doors:
- 1. Vertical and horizontal edges of solid and mineral core doors shall be bonded to core and then abrasively planed before veneering to ensure minimal telegraphing of core part through veneers.
 - 2. Hot press entire door construction under 85 psi to 125 psi at not less than 240°F to ensure even glue bonds at door edges and across face.
 - 3. Provide doors with 1 3/4" (35 mm) minimum thickness, 2-ply stile and rail edges outer ply of same wood species as face veneer; inner ply mill option.
 - 4. Glue lines between face and frame, and between plies of face shall be Type I rigid set adhesive.
 - 5. Non-rated doors shall meet performance criteria as follows:
 - a. Split Resistance:
 - 1) Not less than 500 pounds when tested in compliance with WDMA Test Method 5.
 - b. Direct Screw Withdrawal: ASTM D1037
 - 1) Not less than 1,000 pounds when tested in compliance with WDMA Test Method 10.
 - c. Hinge Loading:
 - 1) Not less than 1,380 pounds when tested in compliance with WDMA Test Method 8.
- C. Labeled Flush Slab Doors: 45, 60, and 90 minute rated
- 1. Mineral core flush doors shall be securely bonded together utilizing Type I adhesive. Manufacture doors where temperature and humidity controls will insure a state of equilibrium between component parts at all times.
 - 2. Core density shall be 26 lbs. per cubic foot (nominal).
 - 3. Provide doors with 2-ply, laminated rail edges of salt free, flame resistant material. Outer ply shall be same wood species as face veneer; inner ply mill option. Securely glue rails to core.
 - 4. Stiles shall be bonded to core and be of salt free, flame resistant material. Stiles shall meet performance criteria as follows:
 - a. Split Resistance:
 - 1) Average of ten test samples shall be not less than 900 load pounds when tested in compliance with *Test Method to Determine Split Resistance of Hinge Edges of Composite Type Fire Doors*.
 - b. Direct Screw Withdrawal: ASTM D1037

- 1) Average of ten test samples shall be not less than 650 load pounds when tested for direct screw withdrawal, using a No. 12 x 1 1/4" steel thread-to-head wood screw of cadmium plated or rust-resistant type
- c. Hinge Loading:
 - 1) Not less than 860 pounds when tested in compliance with WDMA Test Method 8.
- d. Cycle/Slam: ANSI A151.1, Section 2.5
 - 1) 200,000 cycles with no loose hinge screws or other visible signs of failure
5. Labeled doors shall be manufactured to sizes as needed to provide proper clearances without field trimming. This procedure shall be followed to assure full thickness of edge bands.
6. Provide salt free non-combustible internal solid blocking for fire doors with mineral core. Arrange blocking in door so that surface mounted hardware such as, but not limited to, closers, exit device, etc. may be secured to door without a need for through bolts. A lock block, minimum size 5x12 shall be supplied for bored and mortised locks. Provide top and bottom blocking for attachment of hardware; minimum size 5". Provide lock blocks as needed for flushbolts at locations indicated on hardware templates.
7. Provide metal edges only on pairs of fire doors with two surface mounted vertical rod exit devices. Other pairs will be furnished with metal edges and overlapping astragal. Metal edges and astragal shall be veneer wrapped with same specie as door face.
8. Metal astragal for pairs of fire doors shall be formed, pre-machined and veneer wrapped with same specie as door face.
9. At exit enclosures, provide doors listed for 450°F maximum temperature rise rating for 30 minutes of exposure.
10. Fire endurance test shall have neutral pressure level established at <40" (1016 mm) above floor after 5 minutes and maintained during entire test period.
11. Doors shall be constructed as tested and listed by Underwriters Laboratories. Other nationally recognized testing agencies having a factory inspection service may be used subject to approval of authority having jurisdiction.
12. Should doors indicated to be fire-rated not qualify for appropriate labeling because of design, hardware, or other reason, notify Architect before starting fabrication of that item.

2.06 FINISHES

- A. General Requirements:
 1. Wood doors shall be furnished with a shop-applied finish. Defer only final touch-up, cleaning, and polishing until after installation.
 2. Exposed surfaces, including top and bottom rails, shall be sealed.
 3. Completed finishes applied to exposed surfaces shall show no noticeable finish sanding scratches, runs, sags, blistering, blushing, checking or crazing, cracking, glue spots, or other similar conditions.
 4. Orange peel, field repairs, and touch-ups shall not be noticeable beyond 3'-0" in completed finishes applied to exposed surfaces.
- B. Shop Applied Finishes: Catalyzed polyurethane AWI 1500
 1. Quality Grade: Premium
 3. Transparent Finish: AWI System #TR-6
 - a. Color: Stain to match control sample provided by Architect
 - b. Sheen (60° gloss meter): Satin; 32° - 36° ASTM D523
 - c. Effect: Partially filled pore
 - d. An ultraviolet sun-screening agent shall be added to finish coat to inhibit discoloration and darkening of mahogany and cherry veneers.
 4. Opaque Finish: AWI System #OP-6
 - a. Color: Match color selected by Architect; refer to Appendix A - Schedule of Finishes
 - b. Sheen (60° gloss meter): 60 Semi-gloss; 55° - 75° ASTM D523
 - c. Effect: Partially filled pore

2.07 SOURCE QUALITY CONTROL

- A. Fabrication Tolerances:
1. Size:
 - a. Thickness: $\pm 1/16$ "
 - b. Length: $\pm 1/16$ "
 - c. Standard Widths: $\pm 1/16$ "
 - d. Pre-fit Widths: $\pm 1/32$ "
 2. Factory Hardware Preparation: Comply with tolerances indicated on hardware templates.
 3. Warp shall be measured as a distortion in door itself, and shall not refer to door in relation to frame or jamb in which it is hung. Warp shall not exceed $1/4$ " in plane of door itself.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Site Verification of Conditions
1. Examine frames and other conditions under which installation of wood doors is to be performed.
 2. Correct conditions detrimental to timely and proper hanging of doors.
 3. Do not proceed until unsatisfactory conditions have been corrected.
 4. Commencement of installation constitutes acceptance of conditions and responsibility for satisfactory performance.

3.02 INSTALLATION

- A. General Requirements:
1. Install fire-rated doors in corresponding fire-rated frame in compliance with NFPA No. 80 and 101.
 - a. Preparation of 20, 45, 60, and 90 minute doors shall be done under label service in compliance with manufacturer's service procedure. This includes trimming for size, except a maximum of $3/4$ " off bottom of door.
 - b. Preparation for locks, latches, hinges, closers, lights, louvers, astragal, and any fabrication shall be done under licensed label service.
 2. Hang doors to operate freely, but not loosely, and free from rattling when in latched position. Doors shall be free from hinge bound conditions, sticking or binding with hardware properly adjusted and in functioning order.
 3. Align doors to frame for proper fit and uniform clearance. Fit doors tightly against stops. Doors that are warped, twisted, or which are not in true plane shall be removed and replaced at no additional cost to Owner.
 4. Trim doors width by cutting equally on both jamb edges. Seal cut surfaces after fitting and machining.
 5. Trim door height by cutting equally from top and bottom edges to a maximum of $3/4$ ". Seal cut surfaces after field-cutting with oil base paint, lacquer, or varnish.
 6. Surface mounted hardware items on solid core doors shall be applied with sheet metal screws in pilot drilled holes.
 7. Provide threaded-to-head wood screws for fastening hardware on doors.
 8. Pilot holes shall be drilled for screws attaching hinges, lock hardware and other devices to wood doors. Pilot holes shall not exceed 90% of root diameter of screw.
- B. Hanging Tolerances:
1. Diagonal Distortion (Warp): $1/4$ " maximum
 - a. Tolerance shall be measured with a straight edge or taught string, corner to corner, over an imaginary 36 " x 84 " surface area.
 2. Vertical Distortion (Bow): $1/4$ " maximum
 - a. Tolerance shall be measured with a straight edge or taught string, top to bottom, over an imaginary 36 " x 84 " surface area.
 3. Width Distortion (Cup): $1/4$ " maximum
 - a. Tolerance shall be measured with a straight edge or taught string, edge to edge, over an imaginary 36 " x 84 " surface area.

4. Doors shall not extend beyond 1/16" from face of jamb, or more than 1/8" behind jamb face.
- C. Clearances: Subject to $\pm 1/32"$ (0.8 mm) tolerance
1. Head and Jambs: 1/8" (3 mm)
 2. Meeting Edges for pairs of doors: 1/8" (3 mm)
 3. Clearances at Bottom of Fire Doors:
 - a. Where no threshold is used, allow not more than 3/4" (20 mm) above floor slab.
 - b. Where a threshold is used, allow not more than 3/8" (10 mm) above threshold.
 - c. Where floor finish material is used, allow not more than 1/2" (12 mm) above finish material.
 4. Undercut non-rated doors sufficiently to allow clearance above finish floors and where indicated on Drawings to allow for adequate air transfer. Provide doors with sufficient undercut to allow clearance above finish floors.
 - a. Where scheduled floor finish material is less than 1/2" (12 mm) thick allow not more than 5/8" (16 mm) above top of substrate to which it is applied.
 - b. Where scheduled floor finish material is more than 1/2" (12 mm) thick allow not more than 1/4" (6 mm) above finish material.
 - c. Allow not more than 1/4" (6 mm) above threshold.

3.03 FIELD QUALITY CONTROL

- A. Operational Test:
1. After installation of fire doors is completed, operational tests shall be conducted on each door.
 2. Tests shall be adequate to determine that system has been installed and functions as intended.

3.04 REPAIR/RESTORATION

- A. Adjust and check each door to ensure proper operating and function.
- B. Replace or re-hang doors that are hinge bound and do not swing or operate freely. Replace doors that are warped, twisted, or which are not in true planes.
- C. Replace prefinished doors damaged during installation.

END OF SECTION 08 14 00

SECTION 08 70 00 - HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included: Door hardware

1.03 SUBMITTALS

A. Product Data:

1. Submit manufacturer's literature describing products to be provided.

B. Shop Drawings:

1. Before fabrication or delivery of hardware, submit 3 copies of hardware schedule.
 - a. Supplier shall assume sole responsibility for provision, proper coordination and function of finish hardware required for openings, whether or not listed in schedule below.
 - b. Architect's acceptance of hardware schedule shall not be construed as a complete check, nor shall it relieve supplier from responsibility for errors, deviations, or omissions from code requirements, and need to satisfactorily complete Project.
2. Submit 3 copies of keying schedule.

1.03 QUALITY ASSURANCE

A. Qualifications:

1. Hardware supplier shall be a company specializing in distribution of contract hardware for a period of at least 5 years.
2. Supplier shall have, on staff, a full time employee who is a member in good standing of Door and Hardware Institute and a Certified Architectural Hardware Consultant.

B. Regulatory Requirements:

1. Uniform Federal Accessibility Standards
2. ADA - Americans with Disabilities Act
3. National Fire Protection Association:
 - a. NFPA 80
 - b. NFPA 101
 - c. NFPA 105

C. Coordination:

1. Before ordering materials, carefully examine scale, full size, and shop drawings of work requiring hardware, and verify that material selected will properly fit Work.
2. Coordinate installation of electric hinges, locks, and security devices with installation of electrical connections.

1.04 WARRANTY

- A. Furnish a 2 year factory warranty on door closers against defects in material and workmanship from Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Hinges:

1. Hager

2. McKinney
 3. Stanley Works
- B. Pivot Sets:
1. Glynn-Johnson
 2. LCN
 3. McKinney
 4. Rixon-Firemark
- C. Locksets and Latchsets:
Basis of design shall be Schlage; Lever D series, US26D finish
1. Corbin-Russwin
 2. Sargent
 3. Yale
 4. Schlage
- D. Closers:
1. Dorma
 2. Glynn-Johnson
 3. LCN
 4. Norton
 5. Rixon-Firemark
 6. Sargent
- E. Push Plates and Pull Bars:
1. Brookline
 2. Hiawatha
 3. Ives
- F. Stops, Wall Bumpers, and Silencers:
1. Glynn-Johnson
 2. Hiawatha
 3. Ives
- G. Roller Latches and Bolts:
1. Glynn-Johnson
 2. Ives
- H. Sliding/Pocket Door Track and Carriers:
1. Richards Wilcox
 2. Stanley Works
- I. Thresholds, Door Bottoms, Seals and Stripping:
1. National Guard Products Inc.
 2. Pemko Manufacturing co.
 3. Reese Enterprises Inc.
 4. Zero International Inc.

2.02 MATERIALS

- A. General Requirements:
1. Hardware shall be of best grade, entirely free of imperfections in manufacture and finish, and shall satisfactorily perform various functions required.
 2. Furnish necessary screws, bolts, or other fastenings of suitable size and type to anchor hardware in position and match hardware as to material and finish.
 3. Should any hardware indicated to be installed on fire-rated doors not qualify for appropriate labeling because of design, or any other reason, notify Architect immediately.

- B. Hinges:
1. Provide full mortise, template, 5-knuckle hinges with anti-friction type bearing, conforming to ANSI A156.1. Doors with closers and doors in excess of 40" in width shall be furnished with hinges with oil-impregnated or ball type bearings.
 2. Exterior and entry doors shall have non-removable pins and extra heavy weight hinges.
 3. Doors with locksets shall be furnished with non-removable pins hinges.
 4. Hinges shall be furnished in following quantities:
 - a. Doors up to 90" in height: 1 1/2 pair hinges
 - b. Doors over 90" in height: Add 1 hinge for every additional 30"
 5. Furnish hinge sizes as follows for 1 3/4" thick doors:
 - a. Doors up to 3'-0" wide: 4 1/2 x 4 1/2
 - b. Doors 3'-0" to 3'-4" wide: 5 x 4 1/2
 - c. Doors over 3'-4" wide: Extra heavy 5 x 4 1/2
 6. Where 20 minute doors are scheduled without closers, provide spring hinges.
 7. Finish:
 - a. Opaque Finished Doors: As scheduled
 - b. Transparent Finished Doors: As scheduled
- C. Overhead Closers:
1. Surface mounted or concealed overhead closers shall be fully hydraulic, full rack and pinion action with adjustable spring power, and high strength iron cylinder conforming to ANSI A156.4, Grade 1.
 2. Furnish complete with metal covers, forged steel arms, necessary brackets and thru-bolt fasteners for top of door surface mounted units.
 3. Provide parallel arms where required.
 4. Closers shall be sized in accordance with requirements for accessibility for handicapped and recommendations of manufacturer.
 - a. Maximum Opening Force:
 - i) Interior Non-Fire Rated Doors: 5.0 lbs.
 - ii) Exterior Non-Fire Rated Doors: 8.5 lbs.
 - b. Estimated Closing Force: (based on 36" door and 60% efficiency)
 - i) Interior Non-Fire Rated Doors: 3.0 lbs.
 - ii) Exterior Non-Fire Rated Doors: 5.1 lbs.
 5. Finish: Enamel for surface mounted units to match door hardware
- D. Exit Devices:
1. Exit devices shall conform to ANSI A156.3, Grade 1 and shall be listed by UL for accident and hazard.
 2. Devices shall be push through type, touch pad design with a straight action pad. Compression springs shall be stainless steel and internal parts zinc dichromate coated to prevent corrosion.
 3. Devices shall be capable of electric latch retraction or electric control of outside trim.
- E. Auxiliary Hardware: Conform to ANSI A156.16
1. Interior Stops:
 - a. Wall-mounted stop where doors strike walls; 1" diameter
 - b. Floor-mounted stop at locations where wall stops cannot be used
 - c. Finish: As scheduled
 2. Silencers:
 - a. Tamper proof resilient cushions designed to absorb shock and noise.
 - b. Provide 3 silencers per single door, and 2 for pairs of doors.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions:

1. Examine doors, frame, and related items for conditions that would prevent proper application of hardware.
2. Correct conditions detrimental to timely and proper execution of Work.
3. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General Requirements:

1. Securely install finish hardware items in accordance with accepted schedule and templates furnished with hardware.
2. Finish of exposed fasteners shall match finish of hardware item.
3. Install mortised items flush with adjacent surfaces.
4. Locate items in accordance with Door and Hardware Institute publications.
5. Provide blocking, steel plates or additional studs at all wall door stop locations to absorb impact and prevent damage to wall surface.

B. Keying:

1. Verify keying requirements with Owner and Tenant.
2. Master and grand master keys shall be delivered to Owner or his representative.
3. Locksets shall be construction master keyed for use during construction.
4. Furnish keys for locks as follows:
 - a. Grand Master Keys: 6 total
 - b. Master Keys: 6 per set
 - c. Change Keys: 3 per lock
 - d. Construction Master Keys: 12 total

3.03 ADJUSTING

A. Final Adjustment:

1. Before final completion, adjust hardware so that doors operate in perfect order. Test and adjust hardware for quiet, smooth operation, free of sticking, binding, or rattling. Adjust closers for proper, smooth operation.
2. Exposed hardware shall be carefully cleaned by methods not injurious to finish, immediately preceding occupancy. Replace defective, damaged, or missing hardware.
3. At final completion, properly tag and identify keys and deliver to Owner and/or Tenant.

3.04 HARDWARE SCHEDULE

- A. To define requirements for materials, size, and design, specific products of certain manufacturers have been listed above. Equivalent products of other acceptable manufacturers listed above may be provided.
- B. The Contractor shall engage an Architectural Hardware Consultant to prepare schedules of all hardware components necessary to suit the particular location and function of the doors indicated in the Drawings and hardware schedule therein based on the Basis of Design and the descriptions identified on the Hardware Schedule sheet A601.

END OF SECTION 08 70 00

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included: Glass and Decorative Films as shown on the drawings

1.02 SUBMITTALS

A. Product Data:

1. Submit manufacturer's literature describing products to be provided.

B. Samples:

1. Submit 2 samples of each type of glass other than clear glass; sample size shall be 12" x 12".

1.03 QUALITY ASSURANCE

A. Qualifications:

1. Installer shall be a firm with not less than 5 years successful experience in glazing work similar to required work.
1. When a manufacturer is not indicated, provide products from a company specializing in manufacture of glass and glazing products with a minimum of 5 years experience.
2. Installer shall be trained in installation techniques and procedures of glass and glazing products and shall demonstrate a minimum of 3 years successful experience in such installation. Installer shall employ, on Project, mechanics with a minimum of 2 years documented experience.

B. Regulatory Requirements:

1. Comply with recommendations and requirements of following:
 - a. FGMA Architect's Guide to Glass, Metal, and Glazing
 - b. FGMA Glazing Manual
 - c. FGMA - Sealant Manual
 - d. LSGA - Standards Manual
2. Safety Glazing Materials:
 - a. Provide glazing at Hazardous Locations as determined by CPSC 16 CFR 1201. Glazing shall be in accordance with Consumer Product Safety Act and shall have been tested and labeled.
 - b. Safety glazing shall conform to requirements of ANSI Z97.1.

1.04 PROJECT CONDITIONS

A. Field Measurements:

1. Verify field dimensions prior to fabrication. Manufacturer shall be responsible for details and dimensions not controlled by job conditions and shall indicate all required field measurements beyond his control. Contractor and manufacturer shall cooperate to establish and maintain these field dimensions.

1.05 WARRANTY

- A. Upon notification of defects, within warranty period, replace glass and glazing at no additional cost to Owner.

B. Provide written warranties as follows:

1. Laminated and Tempered Safety Glass:
 - a. 5 year warranty period
 - b. Warranty against delamination (Laminated only)

PART 2 - PRODUCTS

2.01 SELECTIONS

- A. See Appendix A - Schedule of Finishes for supplemental information and material selections.

2.02 ACCEPTABLE MANUFACTURERS

- A. Flat Glass Products:
1. Cardinal
 2. Falconer Glass Industries
 3. Guardian Industries
 4. LOF Glass, Libby - Owens - Ford Co.
 5. PPG Industries
 6. Spectrum Glass Co.
 7. Sunglas Products Inc. - SPI
 8. Tempglass
- B. Patterned Glass Products:
1. AFG Industries Inc.
 2. S.A. Bendheim
 3. Hordis Brothers
 4. Rudy Art Glass Studio
- C. Miscellaneous Glazing Materials:
1. Cadillac Rubber & Plastics
 2. Morton Thiokol Inc.
 3. Pecora Corporation
 4. Rubber Trim Products
 5. Santoprene
 6. Tremco Manufacturing Co.
- D. Mirror Mastics and Sealers:
1. C.A. Gunther Co.
 2. C.R. Laurence Co., Inc.
 3. Palmer Product Corp.
 4. Sommer & Maca Industries, Inc.
- E. Glazing Film:
1. 3M
 2. Approved equal

2.03 ACCESSORIES

- A. General Requirements:
1. Comply with manufacturer's recommendation for selection of hardness, depending upon location of each application, conditions at time of installation and performance requirements indicated.
 2. Provide materials with proven record of compatibility with surfaces and other materials contacted in installation.

2.04 FABRICATION

- A. General Requirements:
1. Cut glass to fit each opening with minimum edge clearances and bit on glass as recommended by glass manufacturer. Do not nip glass edges. Edges may be wheel cut or sawed and seamed at manufacturer's option.

2. When glass is to be pre-cut to sizes obtained from shop drawings, take field measurements of each opening, before glazing to verify adequate bite of glass and minimum edge clearance.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions:
 1. Examine framing and glazing channel surfaces, backing, removable stop design, and conditions under which glazing is to be performed.
 2. Remedy conditions detrimental to proper and timely completion of Work. Do not proceed with glazing until unsatisfactory conditions have been corrected in a manner acceptable to installer.

3.02 INSTALLATION

- A. General Requirements:
 1. Comply with combined recommendations of glass manufacturer and manufacturer of sealants and other materials used in glazing, except where more stringent requirements are shown or specified, and except where manufacturer's technical representatives direct otherwise.
 2. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in same direction as other pieces.
 3. Do not use two different glazing materials in same joint system unless manufacturer of each material has verified compatibility in writing.
- B. Setting Blocks, Edge Blocks, and Spacers:
 1. Two setting blocks shall be placed under lower edge of each light of fixed glass. They shall be sized to limit load from glass to 60 psi, but in no case, less than 4" in length.
 2. Setting blocks shall be equidistant from center of glass, preferably at quarter point locations
 3. Edge blocks a minimum of 4" long shall be located at both jambs of glass with a minimum of two per jamb.
 4. Spacers shall be one of following two types:
 - a. Short lengths of elastomeric material, 1" to 3" in length, spaced approximately 24" on center around perimeter on each side of glass panels to center them in channel.
 - b. Continuous elastomeric rod, strip, or spline extended around entire perimeter of glass panel. A hard sealant tape may also act as a spacer.

3.04 CLEANING

- A. Clean excess sealant or compound from glass and framing members immediately after application.
- B. Remove non-permanent labels from glass surfaces.
- C. Wash and polish glass on both faces not more than 4 days prior to substantial completion. Comply with glass product manufacturer's recommendations for final cleaning.

3.05 PROTECTION

- A. Remove and replace glass which is broken, chipped, cracked, abraded or damaged.
- B. Protect exterior glass from breakage immediately upon installation, by use of crossed streamers attached to framing and held away from glass. Do not apply tape or other markers to surfaces of glass.

END OF SECTION 08 80 00

.SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

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. Non-load-bearing steel framing.
 2. Gypsum board and related products.
 3. Interior Trim.
 4. Aluminum Trim.
 5. Sound Attenuation Fire Batt Insulation.
 6. Semi-rigid Glass Fiber Insulation
 7. Acoustical Sealant.

1.3 DEFINITIONS

- A. Gypsum Board Terminology: Refer to ASTM C 11 and C36 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 SUBMITTALS

- A. Product Data: For each type of product provided.
- B. Samples: For the following products:
 1. Trim Accessories: Full-size sample in 12-inch- (300-mm-) long length for each trim accessory provided.

1.5 QUALITY ASSURANCE

- A. Qualifications:
 1. Installer shall be trained in installation techniques and procedures of gypsum board products and shall demonstrate a minimum of 3 years successful experience in such installation. Installer shall employ, on Project, mechanics with a minimum of 2 years documented experience.
 2. Single Source Responsibility:
 - a. To greatest extent possible, materials, including gypsum board, adhesives, and accessories shall be products of one manufacturer or items standard with manufacturer of gypsum board.
 - b. Provide primers and other undercoat materials which are produced or are specifically recommended by manufacturer to ensure compatibility.
- B. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 1. Fire-Resistance-Rated Assemblies: Indicated by design designations from UL's "Fire Resistance Directory."

- C. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.
 - 1. STC-Rated Assemblies: Indicated by design designations from GA-600, "Fire Resistance Design Manual."
- D. Installation Characteristics. Gypsum board assemblies shall be installed in accordance with Gypsum Association Manuals, GA-201, "Using Gypsum Board for Walls and Ceilings", GA-216, "Application and Finishing of Gypsum Board", GA-223, "Gypsum Board Panel Product Types, Uses, Sizes, and Standards", GA-226, "Application of Gypsum Board to form Curved Surfaces", GA-600, "Fire Resistance Design Manual."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

1.7 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 SELECTIONS

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated. Material to be provided pre-cut to full wall height where possible to minimize waste and field cutting of panels.

2.2 MANUFACTURERS

- A. The following requirements apply for product selection:
 - 1. Products: Subject to compliance with requirements, provide one of the products specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.
- B. Manufacturers:
 - 1. Steel Framing and Furring:
 - a. Clark Steel Framing Systems
 - b. Dale Industries, Inc. - Dale/Incor.
 - c. Dietrich Industries, Inc.
 - d. Marino/Ware
 - e. National Gypsum Company.
 - f. United States Gypsum Co.
 - 2. Gypsum Board and Related Products:
 - a. G-P Gypsum Corp.
 - b. National Gypsum Company.

- c. United States Gypsum Co.
- 3. Interior Trim:
 - a. Dale Industries, Inc. – Dale-Incor.
 - b. Flannery, Inc.
 - c. G-P Gypsum Corp.
 - d. National Gypsum Company.
 - e. United States Gypsum Co.
- 4. Aluminum Trim:
 - a. Fry Reglet Corp.
 - b. MM Systems Corporation.
 - c. Pittcon Industries.
 - d. Manufacturer listed in Appendix A- Schedule of Materials.
- 5. Sound Attenuation Fire Batt Insulation:
 - a. Fibrex.
 - b. Owens Corning.
 - c. United States Gypsum Co.
- 6. Semi-rigid Glass Fiber Insulation:
 - a. Certain-Teed
 - b. Johns Mansville
 - c. Owens Corning.
- 7. Acoustical Sealant:
 - a. Bostik.
 - b. Pecora.
 - c. Tremco
 - d. United States Gypsum Co.

2.3 STEEL SUSPENDED CEILING AND SOFFIT FRAMING

- A. Components, General: Comply with ASTM C 754 for conditions indicated.
- B. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
- C. Hanger Attachments to Concrete: As follows:
 - 1. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching hanger wires and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by a qualified independent testing agency.
 - a. Type: Post installed, chemical or expansion anchor.
 - 2. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by a qualified independent testing agency.
- D. Hangers: As follows:
 - 1. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch (4.12-mm) diameter.
 - 2. Rod Hangers: ASTM A 510 (ASTM A 510M), mild carbon steel.
 - a. Diameter: 1/4-inch (6.34-mm).
 - b. Protective Coating: ASTM A 153/A 153M, hot-dip galvanized.
- E. Furring Channels (Furring Members): Commercial-steel sheet with manufacturer's standard corrosion-resistant zinc coating.
 - 1. Cold Rolled Channels: 0.0538-inch (1.37-mm) bare steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flange, 3/4 inch (19.1 mm) deep.
 - 2. Steel Studs: ASTM C 645.
 - a. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm) (25 gauge).

- b. Depth: As indicated.
- 3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22.2 mm) deep.
 - a. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm) (25 gauge).
- 4. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical, with face attached to single flange by a slotted leg (web).

2.4 STEEL PARTITION AND SOFFIT FRAMING

- A. Components, General: As follows:
 - 1. Comply with ASTM C 754 for conditions indicated.
 - 2. Steel Sheet Components: Complying with ASTM C 645 requirements for metal and with manufacturer's standard zinc coating.
 - 3. Metal stud partition size, gauge and limiting heights shall be sized for a maximum allowable deflection of 1/240.
- B. Steel Studs and Runners: ASTM C 645. and
 - 1. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm) (25 gauge).
 - 2. Depth: As indicated.
- C. Deep-Leg Deflection Track: ASTM C 645 top runner with 2-inch- (50.8-mm-) deep flanges.
- D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm) (25 gauge).
- E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm).
 - 2. Depth: 7/8 inch (22.2 mm).
- F. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep, steel sheet members designed to reduce sound transmission.
 - 1. Configuration: Asymmetrical, with face attached to single flange by a slotted leg (web).
- G. Cold-Rolled Furring Channels: 0.0538-inch (1.37-mm) bare steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flange.
 - 1. Depth: 3/4 inch or 1 1/2 inch as required.
 - 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare steel thickness of 0.0312 inch (0.79 mm).
 - 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
- H. Z-Shaped Furring: With slotted or non slotted web, face flange of 1-1/4 inches (31.8 mm), wall attachment flange of 7/8 inch (22.2 mm), minimum bare metal thickness of 0.0179 inch (0.45 mm), and depth required to fit insulation thickness indicated.
- I. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

2.5 INTERIOR GYPSUM WALLBOARD

- A. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.
- B. Gypsum Wallboard: ASTM C 36.

1. Regular Type:
 - a. Thickness: As indicated.
 - b. Long Edges: Tapered.
 - c. Location: As indicated.
2. Type X:
 - a. Thickness: As indicated.
 - b. Long Edges: Tapered.
 - c. Location: As indicated.

2.6 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
 2. Shapes:
 - a. Corner bead: Use at outside corners.
 - b. Edge Trim and Finish System:
 - 1) LC-Bead: J-shaped; exposed long flange receives joint compound; use at exposed panel edges.
 - 2) L-Bead: L-shaped; exposed long leg receives joint compound; use at exposed panel edges where LC-Bead is not adequate.
 - 3) Fast Mask. Use where indicated or in locations selected by contractor.
 - c. Expansion (Control) Joint: Use where indicated.
 - d. Curved-Edge Corner bead: With notched or flexible flanges; use at curved openings.
- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated
 1. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), alloy 6063-T5.
 2. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.7 SOUND ATTENUATION FIRE BATT INSULATION

- A. General: Comply with ASTM C665, Type I
- B. Facing: Unfaced, unless otherwise indicated.
- C. Thickness: As Indicated.
- D. Size: 16" or 24" (as required to fit framing) x 48"
- E. Recycled Content: Provide blankets with recycled content such that postconsumer recycled content plus one-half of preconsumer recycled constitutes a minimum of 20 percent by weight.
- F. Products:
 - a. Fibrex – Sound Attenuation Fire Batt (SAFB)
 - b. Owens Corning – Sound Attenuation Fire Batt (SAFB)
 - c. United States Gypsum Co.- Thermafiber Sound Attenuation Fire Blanket (SAFB)

2.8 SEMI-RIGID GLASS FIBER INSULATION

- A. General: Comply with UL 723 and ASTM C423

- B. Facing: FSK (foil/scrim/kraft).
- C. Thickness: 1" nominal, unless otherwise indicated.
- D. Products:
 - a. Certain-Teed – CertaPro Commercial Board CB-300
 - b. Johns Mansville – Spin-Glas Board
 - c. Owens Corning – Fiberglass 703

2.9 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475.
- 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 drying-type, all-purpose 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.
- D. Joint Compound for Tile Backing Panels:
 - 1. Water-Resistant Gypsum Backing Board: Use setting-type taping and setting-type, sandable topping compounds.
 - 2. Glass-Mat, Water-Resistant Backing Panel: As recommended by manufacturer.
 - 3. Cementitious Backer Units: As recommended by manufacturer.

2.10 ACOUSTICAL SEALANT

- A. VOC Content: Provide sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 50, Subpart D.
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Acoustical Sealant for Exposed and Concealed Joints:
 - a. Bostik, Chem-Calk 600.
 - b. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
 - c. Tremco, Tremflex 834 Siliconized Acrylic Latex Sealant.
 - d. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
 - e.
- C. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

2.11 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Isolation Strip at Exterior Walls:
 - 1. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.
- E. Polyethylene Vapor Retarder: As specified in Division 7 Section "Building Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Suspended Ceilings: Coordinate installation of ceiling suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers at spacing required to support ceilings and that hangers will develop their full strength.
 - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- B. Coordination with Sprayed Fire-Resistive Materials:
 - 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed-on fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches (600 mm) o.c.
 - 2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of gypsum board assemblies and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

3.3 INSTALLING STEEL FRAMING, GENERAL

- A. Installation Standards: ASTM C 754, and ASTM C 840 requirements that apply to framing installation.
- B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with gypsum board manufacturer's written recommendations or, if none available, with United States Gypsum's "Gypsum Construction Handbook."

- C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement.
 1. Isolate ceiling assemblies where they abut or are penetrated by building structure.
 2. Isolate partition framing and wall furring where it abuts structure, except at floor. Install slip-type joints at head of assemblies that avoid axial loading of assembly and laterally support assembly.
 - a. Use deep-leg deflection track where indicated.
- D. Do not bridge building control and expansion joints with steel framing or furring members. Frame both sides of joints independently.

3.4 INSTALLING STEEL SUSPENDED CEILING AND SOFFIT FRAMING

- A. Suspend ceiling hangers from building structure as follows:
 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers 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.
 3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.
 4. Secure rod hangers to structure, including intermediate framing members, by attaching to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 5. Do not support ceilings directly from permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 6. Do not attach hangers to steel deck tabs.
 7. Do not attach hangers to steel roof decks. Attach hangers to structural members.
 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- B. Installation Tolerances: Install steel framing components for suspended ceilings so members for panel attachment are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member and transversely between parallel members.
- C. Wire-tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.
- D. Install suspended steel framing components in sizes and spacings indicated, but not less than that required by the referenced steel framing and installation standards.
 1. Hangers: 48 inches (1219 mm) o.c.
 2. Furring Channels (Furring Members): 16 inches (406 mm) o.c.
- E. Grid Suspension System: Attach perimeter wall track or angle where grid suspension system meets vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

3.5 INSTALLING STEEL PARTITION AND SOFFIT FRAMING

- A. Install tracks (runners) at floors, ceilings, and structural walls and columns where gypsum board assemblies abut other construction.

1. Where studs are installed directly against exterior walls, install foam-gasket isolation strip between studs and wall.
- B. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
1. For fire-resistance-rated and STC-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid-structure surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed to support gypsum board closures and to make partitions continuous from floor to underside of solid structure.
 - a. Terminate partition framing at suspended ceilings where indicated.
- C. Install steel studs so flanges point in the same direction and leading edge or end of each panel can be attached to open (unsupported) edges of stud flanges first.
- D. Curved Partitions:
1. Cut top and bottom track (runners) through leg and web at 2-inch (50-mm) intervals for arc length. In cutting lengths of track, allow for uncut straight lengths of not less than 12 inches (300 mm) at ends of arcs.
 2. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
 3. Support outside (cut) leg of track by clinching steel sheet strip, 1-inch- (25-mm-) high-by-thickness of track metal, to inside of cut legs using metal lock fasteners.
 4. Begin and end each arc with a stud, and space intermediate studs equally along arcs at stud spacing recommended in writing by gypsum board manufacturer for radii indicated. On straight lengths of not less than 2 studs at ends of arcs, place studs 6 inches (150 mm) o.c.
- E. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
1. Install two studs at each jamb, unless otherwise indicated.
- F. Z-Furring Members:
1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches (610 mm) o.c.
 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (600 mm) o.c.
 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (300 mm) from corner and cut insulation to fit.

3.6 INSTALLING SHAFT WALL ASSEMBLIES

- A. General: Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions.
- B. Do not bridge building expansion joints with shaft-wall assemblies; frame both sides of joints with furring and other support.
- C. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.
1. Where handrails directly attach to gypsum board shaft-wall assemblies, provide galvanized steel reinforcing strip with 0.0312-inch (0.79-mm) minimum thickness of base (uncoated) metal, accurately positioned and secured behind at least 1 face-layer panel.

- D. Integrate stair hanger rods with gypsum board shaft-wall assemblies by locating cavity of assemblies where required to enclose rods.
- E. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
- F. Isolate gypsum finish panels from building structure to prevent cracking of finish panels while maintaining continuity of fire-rated construction.
- G. Install control joints to maintain fire-resistance rating of assemblies.
- H. Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain an airtight and smoke-tight seal; and comply with manufacturer's written instructions or ASTM C 919, whichever is more stringent.

3.7 APPLYING AND FINISHING PANELS, GENERAL

- A. Gypsum Board Application and Finishing Standards: ASTM C 840 and GA-216.
- B. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.
- C. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- E. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- F. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- G. Attach gypsum panels to framing provided at openings and cutouts.
- H. Form control and expansion joints with space between edges of adjoining gypsum panels.
- I. Cover both faces of steel stud partition 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 open concrete coffer, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffer, joists, and other structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

- J. Isolate perimeter of non-load-bearing gypsum board 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 U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- K. STC-Rated Assemblies: Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.
- L. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
 - 1. Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.
- M. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.

3.8 PANEL APPLICATION METHODS

- A. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels either vertically, horizontally, or as 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 board.
 - 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.
- B. Multilayer Application on Ceilings: Apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
- C. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - 1. Z-Furring Members: Apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
- D. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- E. Multilayer Fastening Methods: Fasten base layers and face layers separately to supports with screws.
- F. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- G. Curved Partitions:
 - 1. Install panels horizontally and unbroken, to the extent possible, across curved surface plus 12-inch- (300-mm-) long straight sections at ends of curves and tangent to them.

2. Wet gypsum panels on surfaces that will become compressed where curve radius prevents using dry panels. Comply with gypsum board manufacturer's written recommendations for curve radii, wetting methods, stacking panels after wetting, and other preparations that precede installing wetted gypsum panels.
3. On convex sides of partitions, begin installation at one end of curved surface and fasten gypsum panels to studs as they are wrapped around curve. On concave side, start fastening panels to stud at center of curve and work outward to panel ends. Fasten panels to framing with screws spaced 12 inches (300 mm) o.c.
4. For double-layer construction, fasten base layer to studs with screws 16 inches (400 mm) o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches (300 mm) o.c.
5. Allow wetted gypsum panels to dry before applying joint treatment.

3.9 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:
 1. Break panel behind joint and back by double framing member. Apply acoustical sealant to fill gap and attach control joint to face layer with 9/16" galvanized staples spaced 6" o.c. on both flanges along entire length of joint.
 2. Install in ceiling areas exceeding 2,500 square feet. Distance between ceiling control joints shall not exceed 50'-0" in either direction. A control joints shall be installed where ceiling framing or furring changes direction.
 3. Distance between control joints in partitions and furring shall not exceed 30'-0", and a control joint occurs in structure and exterior wall. Partition height door frames may be considered a control joint.

3.10 FINISHING GYPSUM BOARD ASSEMBLIES

- 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:
 1. Typical finish level for exposed to view locations where flat paints, light textures or wall coverings are to be applied:
 - a. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces. Compound shall be smooth and free of tool marks, ridges and other blemishes.
 2. Typical finish level for exposed to view locations where gloss, semi gloss, enamel or non textured flat paints are specified; where severe lighting conditions occur or where noted on drawings. Severe lighting may include overhead or side wall washers.
 - a. Level 5: Embed tape and apply separate first, fill, and finish coats of joint compound to tape. Apply skim coat to entire surface. Compound shall be smooth and free of tool marks, ridges and other blemishes. Apply drywall primer to prepared surface before application of finish paint.

END OF SECTION 09 21 00

SECTION 09 51 00 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included:
1. Suspended metal grid system
 2. Acoustical ceiling units

1.02 SUBMITTALS

- A. Product Data:
1. Submit manufacturer's literature describing products to be provided.

1.03 QUALITY ASSURANCE

- A. Qualifications:
1. Installer shall be trained or qualified in installation techniques and procedures of acoustical ceiling systems and shall demonstrate a minimum of 3 years successful experience in such installation. Installer shall employ, on Project, mechanics with a minimum of 2 years documented experience.
 2. To greatest extent possible, materials, including acoustical ceiling units, exposed wall moldings, suspension system, and accessories, shall be products of one manufacturer or items standard with manufacturer of acoustical ceiling panel units.
 3. Cast acoustical ceiling units shall be products of the same run.
- B. Regulatory Requirements:
1. Fire Rated Assembly:
 - a. Install fire rated components in strict compliance with requirements of UL. Materials shall bear UL Classification Marking. No deviations from UL assembly shall be allowed.

1.04 MAINTENANCE

- A. Extra Materials:
1. Upon completion of Project, supply Owner with an amount of extra acoustical ceiling units equal to 1% to 2% of total quantity of each type installed. Extra stock shall be provided in clean, clearly marked cartons for Owner's future use.

PART 2 - PRODUCTS

2.01 SELECTIONS

- A. See Appendix A - Schedule of Finishes for supplemental information and material selections.

2.02 ACCEPTABLE MANUFACTURERS

- A. Suspension System:
1. Armstrong World Industries, Inc.
 2. Chicago Metallic Corporation
 3. USG Interiors (Donn)

- B. Acoustical Ceiling Units:

1. Armstrong World Industries, Inc.
2. Celotex Corp.
3. USG Interiors

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Examine areas and conditions under which acoustical ceiling work is to be performed. Verify that layout of hangers will not interfere with other work.
2. Correct conditions detrimental to timely and proper execution of Work.
3. Do not proceed until unsatisfactory conditions have been corrected. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. General Requirements:

1. Install system in accordance with manufacturer's instructions, and as supplemented in this section.
2. Install ceiling system in a true, even plane and in straight courses as indicated on Drawings.
3. Coordinate and fit ceiling components to grilles, lighting fixtures, and other related items. In determining location and spacing of hangers and primary runners, take into consideration weight of grilles, light fixtures, etc., that are to be installed in conjunction with acoustical ceilings.
4. Provide stabilizer bars, clips, splices, and edge mouldings required for a complete installation.

B. Suspension System:

1. Hang system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
2. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.
3. Locate system on room axis leaving equal border units.
4. Do not support components on main runners or cross runners if weight causes total dead load to exceed maximum deflection limitations. Support fixture loads by supplementary hangers located within 6" of each corner; or support components independently.
5. Do not eccentrically load system, or produce rotation of runners.
6. Install wall moldings at intersection of suspended ceiling and vertical surfaces, using longest practical lengths. Provide moldings at junctions with other interruptions. Miter corners where wall moldings intersect, or install corner caps.

C. Acoustical Ceiling Units:

1. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
2. Install acoustical units level, in uniform plane, and free from twist, warp and dents.
3. For tegular or reveal edged units, cut a reveal or rabbet edges of ceiling units at borders and vertical surfaces.
4. Lay directional patterned units in basket weave pattern. Fit border neatly against abutting surfaces.

D. Tolerances:

1. Deflection of grid components shall not exceed 1/360 of span.
2. Variation from Flat and Level Surface: 1/8" in 10 feet maximum
3. Variation from Plumb of Grid Members: 2° maximum; caused by eccentric loads

END OF SECTION 09 51 00

SECTION 09 65 00 - RESILIENT FLOORING

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; all of which may not be indicated or required in the Contract Documents.
 - 1. Vinyl composition tile (VCT).
 - 2. Resilient wall base and accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: Submit no less than 2 samples for each type of product selected and of size indicated below:
 - 1. Tile: full size units.
 - 2. Sheet: 6-by-9-inch (150-by-225-mm) sections of floor covering.
 - 3. Resilient Wall Base and Accessories: Manufacturer's standard-size Samples, but not less than 12 inches (300 mm) long, of each resilient product color and pattern required.
 - 4. Seams: For seamless installation technique indicated and for each flooring product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch (150-by-230-mm) Sample applied to a rigid backing and prepared by Installer for this Project.
- C. Shop Drawings: For sheet floor coverings indicating the floor covering direction and seam locations.
- D. Maintenance Data: For resilient products to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer shall be trained or qualified in installation techniques and procedures of resilient flooring and base and shall demonstrate a minimum of 3 years successful experience in such installation. Installer shall employ, on Project, mechanics with a minimum of 2 years documented experience.
- B. When Static-control Resilient Floor Covering is specified the Installer must employ workers for this Project that are competent in techniques required by manufacturer for static-control floor covering installation and seaming method indicated.
- C. Fire-Test-Response Characteristics: Provide products identical to those tested for fire-exposure behavior per test method indicated by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).
 - 1. Floor Tile: Store on flat surfaces.
 - 2. Sheet Floor Covering: Store rolls upright.

1.6 PROJECT CONDITIONS

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C), in spaces to receive floor covering during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After post-installation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) Insert temperature or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during floor covering installation and 48 hours after floor covering installation.
- D. Install resilient products after other finishing operations, including painting, have been completed..

1.7 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. Floor Tile: Furnish not less than 1 box for each 50 boxes or fraction thereof, of each color, pattern, and size of floor tile installed.
 - 2. Sheet Floor Covering: Furnish not less than 10 linear feet (3 linear m) for each 500 linear feet (152 linear m) or fraction thereof, in roll form for each color, pattern, and type of sheet floor covering installed.
 - 3. Furnish not less than 5 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.1 SELECTIONS

- A. See Appendix A - Schedule of Materials for supplemental information and material selections.

2.2 MANUFACTURERS

- A. The following requirements apply for product selection:
 - 1. Products: Subject to compliance with requirements, provide one of the products specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

B. Manufacturers:

1. Solid Vinyl Floor Tile
 - a. Amtico International Inc..
 - b. Armstrong World Industries, Inc.
 - c. Azrock Commercial Flooring, DOMCO.
 - d. Marley Flexco (USA), Inc.
 - e. Roppe Corporation.
 - f. Manufacturer listed in Appendix A – Schedule of Materials.

2. Vinyl Composition Tile
 - a. Allstate Rubber Corp.
 - b. Armstrong World Industries, Inc.
 - c. Azrock Commercial Flooring, DOMCO.
 - d. Mannington.
 - e. Tarkett Inc.
 - f. VPI, LLC.
 - g. Manufacturer listed in Appendix A – Schedule of Materials.

3. Rubber Floor Tile
 - a. Allstate Rubber Corp.
 - b. Burke Mercer Flooring Products.
 - c. Endura Rubber Flooring.
 - d. Johnsonite.
 - e. Marley Flexco (USA), Inc.
 - f. Mondo Rubber International, Inc.
 - g. Roppe Corporation.
 - h. VPI, LLC.
 - i. Manufacturer listed in Appendix A – Schedule of Materials.

4. Sheet Vinyl Floor Covering
 - a. Armstrong World Industries, Inc.
 - b. Azrock Commercial Flooring, DOMCO.
 - c. Congoleum Corporation.
 - d. Forbo Industries, Inc.
 - e. Johnsonite.
 - f. Lonseal, Inc.
 - g. Mannington Mills, Inc.
 - h. Marley Flexco (USA), Inc.
 - i. Tarkett Inc.
 - j. TOLI International.
 - k. Manufacturer listed in Appendix A – Schedule of Materials.

5. Sheet Rubber Floor Covering
 - a. Johnsonite
 - b. Marley Flexco (USA), Inc.
 - c. Mondo Rubber International, Inc.
 - d. Manufacturer listed in Appendix A – Schedule of Materials.

6. Static-Control Resilient Floor Coverings
 - a. Static-Dissipative Solid Vinyl Floor Tile
 - 1) AB ElectroStatic, American Biltrite (Canada).
 - 2) Forbo Industries, Inc.
 - 3) Marley Flexco (USA).
 - 4) VPI, LLC.
 - 5) Manufacturer listed in Appendix A – Schedule of Materials.

- b. Static-Dissipative Vinyl Composition Tile
 - 1) Armstrong World Industries, Inc.;
 - 2) Manufacturer listed in Appendix A – Schedule of Materials.
 - c. Static-Dissipative Rubber Floor Tile
 - 1) Nora Rubber Flooring.
 - 2) Pirelli Rubber Flooring.
 - 3) Manufacturer listed in Appendix A – Schedule of Materials.
 - d. Static-Dissipative Vinyl Sheet Floor Covering
 - 1) Azrock Commercial Flooring, DOMCO.
 - 2) Polyflor/Bonar Floors Inc.
 - 3) Manufacturer listed in Appendix A – Schedule of Materials.
 - e. Static-Dissipative Rubber Sheet Floor Covering
 - 1) Nora Rubber Flooring.
 - 2) Pirelli Rubber Flooring.
 - 3) Manufacturer listed in Appendix A – Schedule of Materials.
 - f. Static-Dissipative Recycled Rubber Sheet Floor Covering
 - 1) United Technical Products, Inc.; ESD FlexFloor.
 - 2) Manufacturer listed in Appendix A – Schedule of Materials.
7. Resilient wall Base
- 1) Allstate Rubber Corp.
 - 2) Armstrong World Industries, Inc.
 - 3) Azrock Commercial Flooring, DOMCO.
 - 4) Burke Mercer Flooring Products.
 - 5) Johnsonite.
 - 6) Mondo Rubber International, Inc.
 - 7) Roppe Corporation.
 - 8) VPI, LLC.
 - 9) Manufacturer listed in Appendix A – Schedule of Materials.
8. Resilient Molding Accessory
- 1) Burke Mercer Flooring Products.
 - 2) Johnsonite.
 - 3) Marley Flexco (USA), Inc.
 - 4) Roppe Corporation.
 - 5) Manufacturer listed in Appendix A – Schedule of Materials.

2.3 SOLID VINYL FLOOR TILE

- A. Solid Vinyl Floor Tile: ASTM F 1700.
- B. Class: As indicated by product designations.
- C. Type, thickness and Size: As indicated in Appendix A.

2.4 VINYL COMPOSITION TILE

- A. Vinyl Composition Tile (VCT): ASTM F 1066.

- B. Class: As indicated by product designations.
- C. Wearing Surface: As indicated by product designations.
- D. Type, thickness and size: As indicated in Appendix A.

2.5 RUBBER FLOOR TILE

- A. Rubber Floor Tile: ASTM F 1344.
- B. Class: As indicated by product designations.
- C. Hardness: Manufacturer's standard hardness, measured using Shore, Type A durometer per ASTM D 2240.
- D. Wearing Surface , type, thickness and size: As indicated in Appendix A.

2.6 SHEET VINYL FLOOR COVERING

- A. Unbacked Sheet Vinyl Floor Covering: ASTM F 1913
- B. Sheet Vinyl Floor Covering With Backing: ASTM F 1303.
- C. Color and pattern: As indicated in Appendix A.
- D. Wearing Surface, Sheet Width and Seaming Method: As indicated by product designation.
- E. Seaming Method: As indicated in Appendix A.

2.7 SHEET RUBBER FLOOR COVERING

- A. Hardness: ASTM D 2240. Not less than 85 Shore A.
- B. Slip resistance: ASTM D 2047
- C. Static Load Limit: ASTM F 970
- D. Color and pattern: As indicated in Appendix A.
- E. Wearing Surface, Sheet Width and Seaming Method: As indicated by product designation.
- F. Seaming Method: As indicated in Appendix A.

2.8 STATIC-CONTROL RESILIENT FLOOR COVERINGS

- A. Static-Dissipative Solid Vinyl Floor Tile: ASTM F 1700, Class I (monolithic), Type A (smooth surface); in manufacturer's standard thickness, but not less than 0.08 inch (2.0 mm) thick.
- B. Static-Dissipative Vinyl Composition Tile (VCT): ASTM F 1066 (VCT, non-asbestos formulated), Class 2 (through-pattern tile); tiles 12 by 12 inches (305 by 305 mm), 0.125 inch (3.2 mm) thick.

- C. Static-Dissipative Rubber Floor Tile: ASTM F 1344, except in manufacturer's standard hardness when tested per ASTM D 2240 using Shore, Type A durometer.
 - 1. Raised-Disc Tile: Class I-A (homogenous rubber, solid color); tiles 39.37 by 39.37 inches (1000 by 1000 mm); 0.20-inch (5.0-mm) overall thickness, 0.19-inch (4.7-mm) base thickness.
 - 2. Hammered-Surface Textured Tile: Class I-B (homogenous rubber, through-mottled pattern).
 - 3. Smooth or Textured Surface Tile: Class I-B (homogenous rubber, through-mottled pattern).
- D. Static-Dissipative Vinyl Sheet Floor Covering: ASTM F 1913 (unbacked) or ASTM F 1303, Type II, Grade I, Class B (nonfoamed plastic backing); in manufacturer's standard roll size; in manufacturer's standard thickness, but not less than 0.08 inch (2.0 mm) thick.
- E. Static-Dissipative Rubber Sheet Floor Covering: ASTM F 1859, Type I (homogenous); in manufacturer's standard roll width and length; not less than 0.08 inch (2.0 mm).
- F. Static-Dissipative Recycled Rubber Sheet Floor Covering: Manufactured from post-consumer tire rubber; in manufacturer's standard roll width and length; 0.20 inch (5.0 mm) thick.
- G. Static-Control Properties:
 - 1. Electrical Resistance: Test per ASTM F 150 with 100-V applied voltage.
 - a. Average greater than 1 megohm and less than or equal to 1000 megohms when test specimens are tested surface to ground.
 - b. Average no less than 1 megohm and less than or equal to 1000 megohms when installed floor coverings are tested surface to ground.
 - 2. Static Generation: Less than 300 V when tested per AATCC-134 at 20 percent relative humidity with conductive footwear.
 - 3. Static Decay: 5000 to 0 V in less than 0.25 seconds when tested per FED-STD-101/4046.1.
- H. Color: As indicated in Appendix A.

2.9 RESILIENT WALL BASE

- A. Wall Base: ASTM F 1861.
- B. Type (Material Requirement): As indicated in Appendix A.
- C. Group (Manufacturing Method): As indicated by product designation.
- D. Style, minimum thickness and height: As indicated in Appendix A.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed or premolded.
- G. Inside Corners: Job formed or premolded.
- H. Surface: Smooth.

2.10 RESILIENT MOLDING ACCESSORY

- A. Description: As indicated in Appendix A.
- B. Material, profile, color and dimensions: As indicated in Appendix A.

2.11 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by resilient product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 1. Use adhesive that comply with the following limits for VOC content when calculated according to 40 CFR 50, Subpart D:
 - a. VCT Tile Adhesive: Not more than 50 g/L.
 - b. Rubber Floor Adhesives: Not more than 60 g/L.
- C. Static-Control Adhesive: Adhesive product of floor covering manufacturer that produces conductive continuity of floor covering system.
- D. Heat-Welding Bead: Solid-strand product of floor covering manufacturer.
 - 1. Color: Match floor covering.
- E. Integral-Flash-Cove-Base Accessories:
 - 1. Cove Strip: 1-inch (25-mm) radius provided or approved by floor covering manufacturer.
 - 2. Cap Strip: Square metal, vinyl, or rubber cap provided or approved by floor covering manufacturer.
- F. Static-Control Grounding Strips: Provided and approved by floor covering manufacturer and that produce conductive continuity of floor covering system to ground connection.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

3. Moisture Testing:
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. 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. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.
- E. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.
- F. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
 1. Do not install resilient products until they are same temperature as space where they are to be installed.
- G. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION, GENERAL

- A. Arrange for manufacturer's representative to oversee installation of static-control resilient floor coverings.
- B. Scribe, cut, and fit resilient flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- C. Extend tiles into toe spaces, door reveals, closets, and similar openings.
- D. Terminate resilient flooring at centerline of door openings where adjacent floor finish is dissimilar. Install edge strips at unprotected or exposed edges, and where flooring terminates.
- E. Where movable partitions are shown, install resilient flooring before partitions are erected.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- G. Adhere floor coverings substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- H. Immediately after installation of resilient flooring, roll floor in both directions with a 100 to 150 pound, three section roller to insure full contact between adhesive and flooring.

3.4 TILE INSTALLATION

- A. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 1. Lay tiles square with room axis unless otherwise indicated in drawings.

- B. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles in pattern of colors and sizes indicated in drawings.
- C. Static-Control Tiles: In each space where conductive solid vinyl floor tile is installed, install maintenance tile identifying conductive floor tile in location approved by Architect.

3.5 SHEET FLOOR COVERINGS INSTALLATION

- A. Unroll sheet floor coverings and allow them to stabilize before cutting and fitting.
- B. Lay out sheet floor coverings as follows:
 - 1. Maintain uniformity of floor covering direction.
 - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in floor covering substrates.
 - 3. Match edges of floor coverings for color shading at seams.
 - 4. Avoid cross seams.
- C. Seamless Installation:
 - 1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to permanently fuse sections into a seamless floor covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining floor covering surfaces.
 - 2. Chemically Bonded Seams: Bond seams with chemical-bonding compound to permanently fuse sections into a seamless floor covering. Prepare seams and apply compound to produce tightly fitted seams without gaps, overlays, or excess bonding compound on floor covering surfaces.
- D. Integral Flash Cove Base: Cove floor coverings 6 inches (152 mm) up vertical surfaces. Support floor coverings at horizontal and vertical junction with cove strip. Butt at top against cap strip.

3.6 RESILIENT WALL BASE INSTALLATION

- A. Apply wall base to walls, columns, pilasters, and other permanent fixtures in rooms and areas where base is required in drawings.
- B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- C. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- D. Do not stretch wall base during installation.
- E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.
- F. Premolded Corners: Install premolded corners before installing straight pieces.
- G. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.

2. Inside Corners: Use straight pieces of maximum lengths possible. Form by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

3.7 RESILIENT ACCESSORY INSTALLATION

- A. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

3.8 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing resilient product installation:
 1. Remove adhesive and other blemishes from exposed surfaces.
 2. Sweep and vacuum surfaces thoroughly.
 3. Damp-mop surfaces to remove marks and soil.
 - a. Do not wash surfaces until after time period recommended by manufacturer.
- B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
 1. Apply protective floor polish to horizontal surfaces that are free from soil, visible adhesive, and surface blemishes if recommended in writing by manufacturer.
 - a. Use commercially available product acceptable to manufacturer.
 - b. Coordinate selection of floor polish with Owner's maintenance service.
 2. Static-control Resilient Floor Coverings:
 - a. Do not wax static-control resilient floor coverings.
 - b. If recommended in writing by static-control resilient floor tile manufacturer, apply protective static-control floor polish formulated to maintain or enhance tile's electrical properties to tile surfaces that are free from soil, adhesive, and surface blemishes.
 - 1) Verify that both polish and its application method are approved by tile manufacturer and that polish will not leave an insulating film that reduces tile's effectiveness for static control.
 3. Prohibit heavy traffic on floor finish for a minimum of 72 hours after installation.
 4. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion
 5. Do not move heavy and sharp objects directly over surfaces. Place hardboard or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION 09 65 00

SECTION 09 68 13 - CARPET TILING

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 modular, fusion-bonded tufted carpet tile and resilient molding accessory.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Existing flooring materials to remain, where applicable.
 - 3. Carpet tile type, color, and dye lot.
 - 4. Type of subfloor.
 - 5. Type of installation.
 - 6. Pattern of installation and type of adhesive to be used.
 - 7. Pattern type, location, and direction.
 - 8. Pile direction.
 - 9. Type, color, and location of insets and borders.
 - 10. Type, color, and location of edge, transition, and other accessory strips.
 - 11. Transition details to other flooring materials.
- C. 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.
 - 3. Resilient Molding Accessory when required: 12-inch- (300-mm-) long Samples for approval and color selection.
- D. Qualification Data: For Installer.
- E. 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.
- F. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer shall be trained in installation techniques and procedures of specified method and shall demonstrate a minimum of 3 years successful experience in such installation. Installer shall employ, on Project, mechanics with a minimum of 2 years documented experience.
 - 2. Single Source Responsibility:
 - a. To greatest extent possible, materials shall be products of one manufacturer or items standard with manufacturer of carpet tile.
 - b. Provide primers and other undercoat materials which are produced or are specifically recommended by manufacturer of adhesives to ensure compatibility of system.
- B. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated by each specified carpet tile manufacturer, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Provide products that comply with the Consumer Product Safety Commission CPSC FF-1 Surface Flammability of Carpets and Rugs.
- D. Mockups: Before installing carpet tile, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104, Section 5, "Storage and Handling."

1.6 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."
- B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- 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.

1.7 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which 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 loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.

3. Provide a written warranty covering repair or replacement of defective materials and workmanship for a period of 2 years from Date of Substantial Completion. Reinstall carpet that is wrinkled and correct seam failures and other conditions due to faulty installation at no additional cost to Owner.
4. Warranty Period: 10 years from date of Substantial Completion.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, 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 10 sq. yd. (8.3 sq. m) for each type indicated.

PART 2 - PRODUCTS

2.1 SELECTIONS OF CARPET TILE

- A. See Appendix A - Schedule of Materials for supplemental information and material selections.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
- C. Resilient Molding Accessories:
Unless otherwise specified in Appendix A – Resilient Molding Accessories; provide the following moldings when required. Color: to be selected by the Architect.
 1. Carpet Edge Strip:
 - a. Flexco - #184, Edge Guard
 - b. Johnsonite - #EG-XX-L, Edge Guard
 - c. Burkemercer - #700, Imperial Reducer
 - d. Roppe - #39, Carpet Edge
 2. Carpet Reducer Strip:
 - a. Flexco - #177B, Carpet Reducer
 - b. Johnsonite - CRS-XX-B, Reducer
 - c. Burkemercer - #146, Universal Reducer
 - d. Roppe - #26, Reducer Strip
 3. Joiner Strip:
 - a. Flexco - #167, Tile & Carpet Joiner
 - b. Johnsonite - CTA-XX-A, Carpet-to-Tile Adaptor
 - c. Burkemercer - #700, Imperial Reducer
 - d. Roppe - #50 Tile/Carpet Joiner

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. 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. Subfloor are level with a maximum surface variation of $\frac{1}{4}$ " in 10 feet non-cumulative.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. For wood subfloors, verify the following:
 - 1. Subfloor are level with a maximum surface variation of $\frac{1}{4}$ " in 10 feet non-cumulative.
 - 2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
- D. For metal subfloors, verify the following:
 - 1. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
- E. For painted subfloors, verify the following:
 - 1. Perform bond test recommended in writing by adhesive manufacturer.
- F. For raised access flooring systems, verify the following:
 - 1. Access floor complies with requirements specified in Division 10 Section "Access Flooring."
 - 2. Access floor substrate is compatible with carpet tile and adhesive if any.
 - 3. Underlayment surface is flat, smooth, evenly planed, tightly jointed, and free of irregularities, gaps greater than $\frac{1}{8}$ inch (3 mm), protrusions more than $\frac{1}{32}$ inch (0.8 mm), and substances that may interfere with adhesive bond or show through surface.
- G. Proceed with installation only after unsatisfactory conditions have been corrected.

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 $\frac{1}{8}$ inch (3 mm) wide or wider and protrusions more than $\frac{1}{32}$ 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; unless otherwise specified in Appendix A.
- 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.
- H. Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protection of Indoor Installations."
- C. Do not use Carpet Mask for carpet protection; it voids carpet tile manufacturer's warranty.
- D. 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 09 68 13

SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included:
1. Work required under this section consists of surface preparation, priming, painting, and finishing work necessary to complete Work indicated or reasonably implied on Drawings.

1.02 SUBMITTALS

- A. Product Data:
1. Submit a complete list of products proposed for use, including identifying product names and catalog numbers.
- B. Samples:
1. Submit 2 samples of each color and material selected.
 2. Samples shall be submitted on 12" x 12" hardboard and shall be labeled on back, identifying color name and number, manufacturer, and product name.

1.03 QUALITY ASSURANCE

- A. Qualifications:
1. When a product manufacturer is not indicated, provide products from a company specializing in manufacture with a minimum of 5 years experience.
 2. Applicator shall be trained in installation techniques and procedures of painting materials and shall demonstrate a minimum of 3 years successful experience in such application. Applicator shall employ, on Project, mechanics with a minimum of 2 years documented experience.
- B. Regulatory Requirements:
1. Conform to applicable codes and ordinances for flame, fuel, smoke, and volatile organic compound (VOC) ratings requirements for finishes at time of application.

1.04 FIELD SAMPLE

- A. Requirements:
1. Contractor shall schedule meeting with Architect to review the first finished items. Review shall be scheduled so as not to impede the progress of the project but shall occur prior to purchase of materials.
 2. The first finished items of each color will be reviewed for color, texture and workmanship.
 3. The first acceptable item of each color will be used as the project standard.
 4. Field Samples shall be no smaller than 100 sq.ft.. Where two or more colors / finishes adjoin provide 100 sq. ft. of each. Provide as many adjoining materials as possible; ceiling tile, base, carpet, etc..

1.05 MAINTENANCE

- A. Extra Materials:
1. Provide, in manufacturer's unopened original containers, 1 gallon of each top coat color and store where directed by Owner. These containers will constitute extra stock for Owner's future maintenance needs.
 2. Label each container with room locations in addition to manufacturer's label.

PART 2 - PRODUCTS

PAINTING

09 91 00-1

2.01 SELECTIONS

- A. See Appendix A - Schedule of Finishes for supplemental information and material selections.

2.02 ACCEPTABLE MANUFACTURERS

- A. Painting and Finishing Materials:
1. Benjamin Moore
 2. Duron
 3. Glidden
 4. Pittsburgh Paints
 5. Sherwin Williams

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions:
1. Examine surfaces scheduled to be finished for conditions that will adversely affect execution, permanence, or quality of Work and which cannot be put into acceptable condition through preparatory work.
 2. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes until moisture content of surface is below following limits:
 - a. Plaster and Gypsum Board: 12% maximum
 - b. Unit Masonry and Concrete: 12% maximum
 - c. Interior Wood: 15% maximum; in accordance with ASTM D2016
 - d. Exterior Wood: 15% maximum; in accordance with ASTM D2016
 3. Do not proceed with surface preparation or coating application until conditions are suitable. Beginning of installation means acceptance of substrate conditions.

3.02 PREPARATION

- A. Protection:
1. Take precautionary measures to prevent fire hazards and spontaneous combustion. Remove empty paint and coatings containers from Premises.
 2. Place cotton waste, cloths and other hazardous materials in containers, and remove from Premises daily.
 3. Provide drop cloths, shields, and other protective equipment.
 4. Protect elements surrounding work of this section from damage or disfiguration.
 5. As Work proceeds, promptly remove spilled, splashed, or splattered materials from surfaces.
- B. Surface Preparation:
1. General Requirements:
 - a. Remove electrical outlet and switch plates, mechanical diffusers, escutcheons, registers, surface hardware, and fittings prior to starting.
 - b. Surfaces to be painted or finished shall be clean, dry, smooth and free from dust and foreign matter which will adversely affect adhesion or appearance.
 - c. Seal marks which may bleed through surface finishes.
 - d. Remove mildew from impervious surfaces by scrubbing with a tri-sodium phosphate bleach solution acceptable to paint manufacturer. Rinse area with clean, clear water; allow surface to thoroughly dry.
 2. Gypsum Wallboard Surfaces:
 - a. Fill narrow, shallow cracks and small holes with spackling compound.

- b. Rake deep, wide cracks and deep holes; dampen with clean, clear water and fill with thin layers of joint cement.
- 3. Previously Painted Gypsum Wallboard Surfaces:
 - a. Surface defects shall be filled, sanded, and spot primed. Cracks and holes shall be cut back and doubled filled, sanded, and spot primed.
 - b. Remove cracking, flaking, and peeling paint by light sanding and spot prime.
 - c. Glossy surfaces shall be sanded or otherwise treated prior to application of coating systems.
- 4. Metal Surfaces:
 - a. Surfaces must be free of residual deposits of grease, rust, scale, dirt, dust, and oil.
 - b. For shop primed surfaces, sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Prime bare steel surfaces.
 - c. For surfaces not shop primed, remove grease, scale, dirt, and rust. Surfaces shall be cleaned with hand or power tools to produce a clean, smooth surface. Where heavy coatings of scale are evident, remove by wire brushing or abrasive grit blasting. Immediately apply prime coat as scheduled.
 - d. Prepare surfaces of hollow metal doors and frames including tops, bottoms, and surfaces normally concealed from view as described above.
- 5. Previously Finished Metal Surfaces:
 - a. Remove surface contamination by solvent cleaning, steam or high pressure water to remove contamination and oils. Scrape and sand to remove loose paint. Feather edges to make patches inconspicuous.
 - b. Surfaces shall be dulled by sanding. The surface shall be blown off with compressed air.
- 6. Cast-In-Place and/or Precast Concrete Surfaces:
 - a. Allow concrete to cure for 60 to 90 days prior to painting.
 - b. Remove loose particles with stiff brush.
 - c. Remove dirt, scale, efflorescence, powders, laitance, parting compounds, and other foreign matter.
 - d. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry.
 - e. Wash stains caused by weathering or corroding metals with a sodium metasilicate solution after thoroughly wetting with clean, clear water; allow surface to thoroughly dry.
 - f. Fill small surface pock marks and air holes with an exterior latex base prime and fill material. Thoroughly brush or rub over surface and let dry for not less than 24 hours before applying paint.
- 7. Wood Surfaces:
 - a. Sand wood surfaces and edges smooth and even before finishing or painting and between coats. Remove dust after each sanding.
 - b. Remove residue from knots, pitch streaks, cracks, open joints and sappy spots. Knots shall be coated with a pigmented stain sealer prior to painting. Avoid use of shellac as an undercoat.
 - c. Countersink nails and fill nail holes, cracks, open joints and other defects with tinted putty or wood filler after priming is dry and before second coat.
 - d. Prior to installation, apply backprime to woodwork scheduled to receive a field applied painted finish.
 - e. Seal top, bottom, and edges of wood doors to be painted with primer.

3.03 APPLICATION

- A. General Requirements:
 - 1. Number of coats specified are minimum number acceptable. Sand lightly between coats to achieve required finish. Apply additional coats as necessary to provide a smooth, even application.
 - 2. Use deep base primers where required.
 - 3. Vary slightly color of successive paint coats. Allow each coat of paint, varnish and enamel to dry thoroughly before applying succeeding coats.
 - 4. Make edges of paint adjoining other materials or colors sharp and clean, without overlapping.

5. Finish closets same as adjoining rooms, unless otherwise specified.
6. Finish tops, bottoms and edges of doors same as faces of doors.
7. Paint surfaces above ceilings and inside partitions, flat black, behind grilles and registers which are exposed to view or which reflect light.
8. Paint mechanical items as follows:
 - a. Paint, flat black, interior of ducts behind grilles and registers.
 - b. Do not paint name plates or polished surfaces of equipment. Leave clean and free of paint.
 - c. Paint hangers and supports for pipes in exposed areas.

3.04 ADJUSTING

- A. At completion of Work, touch-up and restore finishes where damaged.
- B. Defects in Finished Surfaces:
 1. When stain, dirt, or undercoats show through final coat of paint, correct defects and cover with additional coats until coating or paint film is of uniform finish, color, appearance and coverage.
 2. Correct defects visible from a distance of 5 feet. Runs shall not be permitted.
 3. Refinish whole wall where a portion of finish has been damaged or is not acceptable.

3.05 CLEANING

- A. At completion of day's work, remove from premises rubbish and accumulated materials.
- B. Clean paint spots, oil and other soiling from prefinished surfaces and surfaces with integral finish. Use solvents for metal work which will not damage finished surface.
- C. Leave storage area clean and in same condition required for equivalent spaces in Project.

3.06 SCHEDULE OF PAINT FINISHES

- A. Unless noted otherwise the following list of systems is to be used on this project. To define requirements for materials this specification lists a single product manufactured by a specific manufacturer. Similar products by other manufacturers listed above may be provided.
- B. Interior Coating Systems:
 1. Gypsum Board [Ceilings]: Flat finish
 - a. First Coat: Latex Quick Dry Primer #201
 - b. Second Coat: Regal Wall Satin #215
 - c. Third Coat: same as second
 2. Gypsum Board [Walls]: Eggshell finish
 - a. First Coat: Latex Quick Dry Primer #201
 - b. Second Coat: Regal Aquavelvet #319
 - c. Third Coat: same as second
 3. Previously Painted Gypsum Board:

Same systems as above except primer only required at repairs.
 4. Wood: Natural finish
 - a. First Coat: Quick dry Sanding Sealer #413
 - b. Second Coat: Benwood Satin Finish Varnish #404
 - c. Third Coat: same as second if required
 5. Wood: Transparent finish
 - a. First Coat: Interior Wood Finishes Penetrating Stain #241
 - b. Second Coat: Quick dry Sanding Sealer #413
 - c. Third Coat: Benwood Satin Finish Varnish #404
 6. Wood: Semi-Gloss opaque finish
 - a. First Coat: Alkyd Enamel Underbody #217
 - b. Second Coat: Regal AquaGlo #333
 - c. Third Coat: same as second

7. Ferrous Metals: Eggshell finish
 - a. First Coat: IronClad Retard-X-Rust Inhibitive Latex Primer #162
 - b. Second Coat: Regal Aquavelvet #319
 - c. Third Coat: same as second
8. Ferrous Metals: Semi-gloss finish
 - a. First Coat: IronClad Retard-X-Rust Inhibitive Latex Primer #162
 - b. Second Coat: Regal AquaGlo #333
 - c. Third Coat: same as second
9. Galvanized Metals: Eggshell finish
 - a. First Coat: IronClad Galvanized Metal Latex Primer #155
 - b. Second Coat: Regal Aquavelvet #319
 - c. Third Coat: same as second
10. Galvanized Metals: Semi-gloss finish
 - a. First Coat: IronClad Galvanized Metal Latex Primer #155
 - b. Second Coat: Regal AquaGlo #333
 - c. Third Coat: same as second
11. Aluminum: Eggshell finish
 - a. First Coat: IronClad Retardo Rust Inhibitive Paint #163
 - b. Second Coat: Regal Aquavelvet #319
 - c. Third Coat: same as second
12. Aluminum: Semi-gloss finish
 - a. First Coat: IronClad Retardo Rust Inhibitive Paint #163
 - b. Second Coat: Regal AquaGlo #333
 - c. Third Coat: same as second
13. Concrete Unit Masonry: Eggshell finish
 - a. First Coat: MoorCraft Super-Hide Latex Block Filler #285
 - b. Second Coat: Regal Aquavelvet #319
 - c. Third Coat: same as second
14. Concrete Unit Masonry: Semi-gloss finish
 - a. First Coat: MoorCraft Super-Hide Latex Block Filler #285
 - b. Second Coat: Regal AquaGlo #333
 - c. Third Coat: same as second
15. Brick Masonry, Plaster, and Concrete: Eggshell finish
 - a. First Coat: Latex Enamel Underbody #345
 - b. Second Coat: Regal Aquavelvet #319
 - c. Third Coat: same as second
16. Brick Masonry, Plaster, and Concrete: Semi-gloss finish
 - a. First Coat: Latex Enamel Underbody #345
 - b. Second Coat: Regal AquaGlo #333
 - c. Third Coat: same as second
17. Concrete Floors: (reduce first coat according to label directions)
 - a. First Coat: Latex Floor & Patio Finish #122
 - b. Second Coat: same as first
 - c. Third Coat: same as second

END OF SECTION 09 91 00

SECTION 11 31 00 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included:
 - 1. Kitchen appliances

1.02 SUBMITTALS

- A. Product Data:
 - 1. Submit manufacturer's literature describing products to be provided.
- B. Quality Control Submittals:
 - 1. Manufacturer's Instructions:
 - a. Submit manufacturer's installation procedures which shall be basis for accepting or rejecting actual installation procedures.
- C. Contract Closeout Submittals:
 - 1. Submit instructions for cleaning and maintaining appliances. Include a copy of instruction in Operation and Maintenance Data Manual.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Residential Appliances:
 - 1. Amana
 - 2. ISE; In-Sink-Erator
 - 3. General Electric
 - 4. Kitchen-Aid Inc.
 - 5. Maytag
 - 6. Thermador/Waste King
 - 7. Whirlpool Corp.
 - 8. Manufacturers identified in Appendix B

2.02 MANUFACTURED UNITS

- A. Refer to Appendix B for schedule of Equipment.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine areas and conditions under which work of this section is to be performed; correct conditions detrimental to timely and proper execution of Work.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Coordinate with other trades to assure proper and adequate provisions are made for interface with this portion of Work.
- B. Install appliances in strict accordance with manufacturer's recommendations. Anchor components firmly into position in proper relation to work surfaces, floors, etc.

3.04 ADJUSTING

- A. Touch-up scratches and abrasions to be completely invisible to unaided eye from a distance of 5 feet.
- B. Upon completion of installation and hook-up to utilities, put operating components of appliances through at least 5 complete operating cycles, adjusting as necessary to secure optimum level of operation.

3.05 CLEANING

- A. Promptly remove from Site, cartons and packing material associated with work of this section.

END OF SECTION 11 31 00