

SECTION 09 21 16 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

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: Gypsum board shaft wall assemblies.

1.3 ACTION SUBMITTALS

- A. Product Data: For each component of gypsum board shaft wall assembly.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
 - 3. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regionally manufactured[**and regionally extracted and manufactured**] materials. Include statement indicating cost for each regionally manufactured material.
 - a. Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.
 - b. Include statement indicating location of manufacturer and point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials. Indicate distance to Project and fraction by weight of each regionally manufactured material that is regionally extracted.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For shaft wall assemblies, from ICC-ES.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or with gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.

- C. Do not install panels that are wet, moisture damaged, or mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. Low-Emitting Materials: Gypsum shaft wall assemblies shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES

- A. Fire-Resistance Rating: As indicated.
- B. Studs: Manufacturer's standard profile for repetitive members, corner and end members, and fire-resistance-rated assembly indicated.
 - 1. Depth: As indicated.
 - 2. Minimum Base-Metal Thickness: As indicated.
- C. Runner Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least **2 inches** long and matching studs in depth.
 - 1. Minimum Base-Metal Thickness: Matching steel studs.
- D. Firestop Tracks: Provide firestop track at head of shaft wall on each floor level.
- E. Elevator Hoistway Entrances: Manufacturer's standard J-profile jamb strut with long-leg length of **3 inches**, matching studs in depth, and not less than **0.033 inch** thick.
- F. Room-Side Finish: Gypsum board.
- G. Shaft-Side Finish: As indicated by fire-resistance-rated assembly design designation.
- H. Insulation: Sound attenuation blankets.

2.3 PANEL PRODUCTS

- A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than **<Insert number>** percent by weight.
- B. Regional Materials: Gypsum panel products shall be manufactured within **500 miles** of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within **500 miles** of Project site.
- C. Regional Materials: Gypsum panel products shall be manufactured within **500 miles** of Project site.

- D. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
- E. Gypsum Shaftliner Board, Moisture- and Mold-Resistant Type X: ASTM C 1396/C 1396M; manufacturer's proprietary fire-resistive liner panels with moisture- and mold-resistant core and surfaces.
 - 1. Thickness: **1 inch**.
 - 2. Long Edges: Double bevel.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- F. Gypsum Board: As specified in Section 09 29 00 "Gypsum Board."

2.4 NON-LOAD-BEARING STEEL FRAMING

- A. Recycled Content of Steel: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Steel Framing Members: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 1. Protective Coating: ASTM A 653/A 653M, **G40**, hot-dip galvanized unless otherwise indicated.
- C. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with manufacturer's written recommendations.
- B. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes as specified in Section 09 29 00 "Gypsum Board" that comply with gypsum board shaft wall assembly manufacturer's written recommendations for application indicated.
- C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
- D. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
 - 1. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing according to ASTM E 488 conducted by a qualified testing agency.
 - 2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing according to ASTM E 1190 conducted by a qualified testing agency.
- E. Sound Attenuation Blankets: As specified in Section 09 29 00 "Gypsum Board."
- F. Acoustical Sealant: As specified in Section 09 29 00 "Gypsum Board."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to which gypsum board shaft wall assemblies attach or abut, with Installer present, including hollow-metal frames, elevator hoistway door frames, cast-in anchors, and structural framing. Examine for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Sprayed Fire-Resistive Materials: Coordinate with gypsum board shaft wall assemblies so both elements of Work remain complete and undamaged. Patch or replace sprayed fire-resistive materials removed or damaged during installation of shaft wall assemblies to comply with requirements specified in Section 07 81 00 "Applied Fireproofing."
- B. After sprayed fire-resistive materials are applied, remove only to extent necessary for installation of gypsum board shaft wall 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 INSTALLATION

- A. General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and ASTM C 754 other than stud-spacing requirements.
- B. Do not bridge building expansion joints with shaft wall assemblies; frame both sides of expansion 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, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.
 - 1. Elevator Hoistway: At elevator hoistway-entrance door frames, provide jamb struts on each side of door frame.
 - 2. Reinforcing: Where handrails directly attach to gypsum board shaft wall assemblies, provide galvanized steel reinforcing strip with **0.033-inch** minimum thickness of base metal (uncoated), accurately positioned and secured behind at least one layer of face panel.
- D. Penetrations: At penetrations in shaft wall, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
- E. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels, while maintaining continuity of fire-rated construction.
- F. Firestop Tracks: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

- G. Control Joints: Install control joints at locations according to ASTM C 840 and in specific locations approved by Architect while maintaining fire-resistance rating of gypsum board shaft wall assemblies.
- H. Cant Panels: At projections into shaft exceeding **4 inches**, install **1/2- or 5/8-inch-** thick gypsum board cants covering tops of projections.
 - 1. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at **24 inches** o.c. with screws fastened to shaft wall framing.
 - 2. Where steel framing is required to support gypsum board cants, install framing at **24 inches** o.c. and extend studs from the projection to shaft wall framing.
- I. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.4 PROTECTION

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

END OF SECTION 09 21 16

SECTION 09 21 19 - AREA SEPARATION WALL ASSEMBLY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-rated gypsum board and metal stud separation wall assembly.

B. Related Sections:

1. Division 09 Section "Gypsum Board" for typical wall applications.

1.2 PERFORMANCE REQUIREMENTS

A. Fabricate and install systems as indicated but not less than that required to comply with ASTM C754 under the following conditions:

1. Gypsum board partitions:
 - a. Systems to receive gypsum board or backer board: Maximum deflection of $l/360$ of partition height.
2. Wall systems: Withstand minimum positive and negative pressure of 5 psf.

1.3 ACTION SUBMITTALS

A. Product Data: For each component of gypsum board shaft wall assembly.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
3. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regionally manufactured[**and regionally extracted and manufactured**] materials. Include statement indicating cost for each regionally manufactured material.
 - a. Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.
 - b. Include statement indicating location of manufacturer and point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials. Indicate distance to Project and fraction by weight of each regionally manufactured material that is regionally extracted.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver material to site promptly without undue exposure to weather.

B. Deliver in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade.

- C. Store above ground in dry, ventilated space and protect materials from soiling, rusting and damage.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Do not install gypsum board when ambient temperature is below 40°F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements listed products establish standard of quality manufactured by United States Gypsum Company (USG), Chicago, IL. or comparable system by one of the following:
 - 1. BPB America Inc.
 - 2. G-P Gypsum
 - 3. Lafarge North America Inc.
 - 4. National Gypsum Company.

2.2 MATERIALS

- A. Liner Panels: 1 inch thick Sheetrock brand fire-rated Gypsum Liner Panels, 24 inches wide
- B. Shaft Wall Supports:
 - 1. Conform to ASTM A446, Grade A, with G40 hot-dipped galvanized coating per ASTM A525.
 - 2. Studs:
 - a. Shape: "H" or as standard with manufacturer.
 - b. Gauge: As required to fulfill performance criteria, minimum 25 gauge.
 - c. Size: 4 inches
 - d. Runners: Steel C-runner size as required for coordination with studs.
 - e. Angle Clip: 2 inch x 2 ½ inch x 0.063 aluminum breakaway clips.
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. 25-gauge metal framing: Type S screws
 - 2. 20-gauge metal framing: Type S-12 screws
- D. Gypsum Board on exposed side of space: 5/8" fire-rated gypsum board per Section 09 29 00.

2.3 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape: Interior Gypsum Wallboard: Paper.
- 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.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine adjoining construction and conditions under which work is to be installed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install separation wall assemblies per manufacturer's recommendations, and to comply with referenced U.L. fire-rated assemblies.
- B. Joint Treatment
 - 1. Finish joints and fasteners as required by rated assembly.
 - 2. Compounds used for pre-filling are to be compatible with the compound being used for to tape and finish the gypsum board.

END OF SECTION 09 21 19

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

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. Non-load-bearing steel framing systems for interior gypsum board assemblies.
 - 2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.
- B. Related Requirements:
 - 1. Section 05 40 00 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; roof rafters and ceiling joists; and roof trusses.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating costs for each product having recycled content.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For [dimpled steel studs and runners] [firestop tracks], from ICC-ES.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 FRAMING SYSTEMS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.

2. Protective Coating: Coating with equivalent corrosion resistance of ASTM A 653/A 653M, **G40**, hot-dip galvanized unless otherwise indicated.
- C. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.
1. Steel Studs and Runners:
 - a. Minimum Base-Metal Thickness: **0.027 inch**.
 - b. Depth: **3-5/8 inches**.
 2. Dimpled Steel Studs and Runners:
 - a. Minimum Base-Metal Thickness: **0.025 inch**.
 - b. Depth: **3-5/8 inches**.
- D. Slip-Type Head Joints: Where indicated, provide one of the following:
1. Single Long-Leg Runner System: ASTM C 645 top runner with **2-inch-** deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within **12 inches** of the top of studs to provide lateral bracing.
 2. Double-Runner System: ASTM C 645 top runners, inside runner with **2-inch-** deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
 3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- E. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Metal Thickness: As indicated on Drawings.
- G. Cold-Rolled Channel Bridging: Steel, **0.053-inch** minimum base-metal thickness, with minimum **1/2-inch-** wide flanges.
1. Depth: As indicated on Drawings.
 2. Clip Angle: Not less than **1-1/2 by 1-1/2 inches**, **0.068-inch-** thick, galvanized steel.
- H. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base-Metal Thickness: **0.033 inch**.
 2. Depth: As indicated on Drawings.
- I. Resilient Furring Channels: **1/2-inch-** deep, steel sheet members designed to reduce sound transmission.
1. Configuration: Asymmetrical or hat shaped.
- J. Cold-Rolled Furring Channels: **0.053-inch** uncoated-steel thickness, with minimum **1/2-inch-** wide flanges.
1. Depth: **3/4 inch**.
 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of **0.033 inch**.
 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, **0.062-inch-** diameter wire, or double strand of **0.048-inch-** diameter wire.

- K. Z-Shaped Furring: With slotted or nonslotted web, face flange of **1-1/4 inches**, wall attachment flange of **7/8 inch**, minimum uncoated-metal thickness of **0.018 inch**, and depth required to fit insulation thickness indicated.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, **0.062-inch-** diameter wire, or double strand of **0.048-inch-** diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers 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 an independent testing agency.
 - a. Type: Postinstalled, chemical 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 an independent testing agency.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, **0.16 inch** in diameter.
- D. Flat Hangers: Steel sheet, **1 by 3/16 inch** by length indicated.
- E. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of **0.053 inch** and minimum **1/2-inch-** wide flanges.
 - 1. Depth: **2 inches**.
- F. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: **0.053-inch** uncoated-steel thickness, with minimum **1/2-inch-** wide flanges, **3/4 inch** deep.
 - 2. Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: **0.027 inch**.
 - b. Depth: As indicated on Drawings.
 - 3. Dimpled Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: **0.025 inch**.
 - b. Depth: As indicated on Drawings.
 - 4. Hat-Shaped, Rigid Furring Channels: ASTM C 645, **7/8 inch** deep.
 - a. Minimum Base-Metal Thickness: **0.033 inch**.
 - 5. Resilient Furring Channels: **1/2-inch-** deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical or hat shaped.
- G. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation; Drywall Grid System.
 - c. USG Corporation; Drywall Suspension System.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, **1/8 inch** thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- B. Coordination with Sprayed Fire-Resistive Materials:
 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than **24 inches** o.c.
 2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.
 2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.
 3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.
 4. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.

- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Single-Layer Application: **16 inches** o.c. unless otherwise indicated.
 - 2. Multilayer Application: **24 inches** o.c. unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum **1/2-inch** clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Direct Furring:
 - 1. Screw to wood framing.
 - 2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced **24 inches** o.c.
- F. Z-Furring Members:
 - 1. Erect insulation specified in Section 07 21 00 "Thermal Insulation" vertically and hold in place with Z-furring members spaced **24 inches** 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** 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** from corner and cut insulation to fit.

- G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than **1/8 inch** from the plane formed by faces of adjacent framing.

3.5 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Hangers: 48 inches o.c.
 - 2. Carrying Channels (Main Runners): **48 inches** o.c.
 - 3. Furring Channels (Furring Members): **24 inches** o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend 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 suspension system.
 - a. 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 locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 - 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 - 5. Do not attach hangers to steel roof deck.
 - 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 - 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- G. Installation Tolerances: Install suspension systems that are level to within **1/8 inch in 12 feet** measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 09 22 16

SECTION 09 24 00 – PORTLAND CEMENT PLASTER/STUCCO

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: Materials and installation of exterior stucco wall covering.

1.3 REFERENCED DOCUMENTS

A. ASTM Standards:

- 1. A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
- 2. A 653 Specification for Sheet Steel Zinc coated (Galvanized) by the Hot-Dip Process, Commercial Quality
- 3. B 69 Specification for Roller Zinc
- 4. C 144 Specification for Aggregate for Masonry Mortar
- 5. C 578 Specification for Preformed, Cellular Polystyrene Thermal Insulation
- 6. C 847 Standard Specification for Metal Lath
- 7. C 897 Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters
- 8. C 1032 Standard Specification for Woven Wire Plaster Base
- 9. C 1063 Standard Specification for Installation of Lathing and Furring for Portland Cement Plaster
- 10. C 1177 Specification for Glass Mat Gypsum for Use as Sheathing
- 11. C 1396 Specification for Gypsum Board
- 12. D 226 Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
- 13. D 1784 Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- 14. E 84 Test Method for Surface Burning Characteristics of Building Materials
- 15. E 119 Method for Fire Tests of Building Construction and Materials
- 16. E136 Behavior of Materials in Vertical Tube Furnace at 750°C
- 17. E 283 Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- 18. E 330 Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
- 19. E 331 Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- 20. E 2430 Standard Specification for Expanded Polystyrene ("EPS") Thermal Insulation Boards For Use in Exterior Insulation and Finish Systems ("EIFS").
- 21. G 155 Standard Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials

B. APA Engineered Wood Association

- 1. E 30 Residential and Commercial Construction Guide

C. EIMA (EIFS Industry Members Association)

- 1. EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board

D. Gypsum Association

- 1. GA-253 Application of Gypsum Sheathing

- E. ICBO ES (International Conference of Building Officials Evaluation Service)
 - 1. AC 11 Acceptance Criteria for Cementitious Exterior Wall Coatings
- 1.4 DESIGN REQUIREMENTS
- A. Structural (wind and axial loads)
 - 1. Design for maximum allowable deflection, normal to the plane of the wall, of L/360
 - 2. Design for wind load in conformance with code requirements. Consult applicable code compliance report.
 - B. Moisture Control
 - 1. Prevent the accumulation of water into or behind the stucco, either by condensation or leakage into the wall construction, in the design and detailing of the wall assembly.
 - a. Provide corrosion resistant flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall.
 - b. Air Leakage Prevention—prevent excess air leakage in the design and detailing of the wall assembly. Provide continuity between air barrier components in the wall assembly.
 - c. Vapor Diffusion and Condensation-- perform a dew point analysis of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust insulation thickness and/or other wall assembly components accordingly to minimize the risk of condensation. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates.
 - d. On framed wall construction provide a code compliant moisture barrier over sheathing. Note: Building codes vary with respect to the type moisture barrier required and the number of layers.
 - e. Protect sills of rough openings with barrier membrane. Where casing bead is used back-to-back at expansion joints, back joints with barrier membrane. Refer to Sto details.
 - C. Grade Condition
 - 1. Do not specify the stucco for use below grade or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. Provide minimum 4 inch (100 mm) clearance above earth grade, minimum 2 inch (51 mm) clearance above finished grade (pavers/sidewalk). Provide increased clearance in freeze/thaw climate zones.
 - D. Sloped surfaces, including Foam Trim and Projecting Architectural Features attached to stucco.
 - 1. Avoid the use of stucco on build-outs or weather exposed sloped and horizontal surfaces (refer to 2 and 3 below).
 - 2. Build out trim and projecting architectural features from the stucco wall surface with code compliant EPS foam. All foam trim and projecting architectural features must have a minimum 1:2 [27°] slope along their top surface. All foam horizontal reveals must have a minimum 1:2 [27°] slope along their bottom surface. Increase slope for northern climates to prevent accumulation of ice/snow and water on surface. Where trim/feature or bottom surface of reveal projects more than 2 inches (51 mm) from the face of the wall plane, protect the top surface with waterproof base coat. Avoid the use of trim and features that exceed the maximum allowable thickness of EPS permitted by code (typically 4 inches [100 mm]) unless approved by the code official. Periodic inspections and increased maintenance may be required to maintain surface integrity of finishes

- on weather exposed sloped surfaces. Limit projecting features to easily accessible areas and limit total area to facilitate maintenance and minimize maintenance burden. Refer to Sto details.
3. Do not use EPS foam on weather exposed projecting ledges, sills, or other projecting features unless supported by framing or other structural support and protected with metal coping or flashing. Refer to Sto details.
- E. Joints
1. Provide two piece expansion joints in the stucco system where building movement is anticipated: at joints in the substrate or supporting construction, where the system is to be installed over dissimilar construction or substrates, at changes in building height, at floor lines, at columns and cantilevered areas.
 2. Provide one piece expansion joints every 144 ft² (13 m²)*. Cut and wire tie lath to the expansion joint accessory so lath is discontinuous beneath the accessory. Do not exceed length to width ratio of 2-1/2:1 in expansion joint layout and do not exceed more than 18 feet (5.5 m) in any direction without an expansion joint. Where casing bead is used back-to-back as the expansion joint, back the joint with barrier membrane.
 3. Provide one piece expansion joints at through wall penetrations, for example, above and below doors or windows.
 4. Provide minimum 3/8 inch (9 mm) wide joints where the system abuts windows, doors and other through wall penetrations.
 5. Provide appropriate accessories at stucco terminations and joints.
 6. Provide appropriate sealant at stucco terminations.
 7. Provide shop drawing, indicating location of joints for Architect's review and approval.
- F. Fire Protection
1. Do not use foam trim in excess of 4 inches (100 mm) thick unless approved by the code official on buildings of noncombustible construction.
 2. Refer to the applicable code compliance report for other limitations and fire-resistive assemblies that may apply.
- G. Solid Substrates
1. Provide surface plane tolerance not to exceed ¼ inch in 10 feet (6 mm in 3.0 m).
 2. Concrete—prevent the use of form oil, curing compounds or other bond breakers that inhibit bond to the surface or provide for their removal.
 3. Concrete Masonry—provide open texture concrete masonry units with flush joints.
- H. Stucco Thickness: General
1. Stucco thickness shall not exceed 5/8-inch (16 mm) applied in three coats.
 2. Thickness shall be uniform throughout the wall area.
- I. Stucco Thickness: Specific

1.5 PERFORMANCE REQUIREMENTS

A. StoPowerwall Stucco

TEST	METHOD	CRITERIA	RESULT
Accelerated Weathering	ASTM G 26	2000 hours	No chalking, cracking, checking, crazing, or erosion
Combustibility	ASTM E 136	Non-combustible Material	Pass
Freeze-Thaw	ICC-ES AC 11	10 cycles	No cracking, checking or crazing
Surface Burning	ASTM E 84	Flame spread of less than 25, Smoke Developed of less than 450	Flame Spread: < 5 Smoke Developed: < 10
Fire Resistance	ASTM E 119	One hour fire resistive rating	Pass, refer to ICC-ES ESR 2323 for listed assemblies.
Wind Loads	ASTM E 330	Allowable and ultimate design pressures	Pass, refer to ICC-ES ESR 2323 for listed assemblies.

1.6 SUBMITTALS

- A. Manufacturer's specifications, details, installation instructions and product data.
- B. Manufacturer's code compliance report.
- C. Manufacturer's standard warranty.
- D. Samples for approval as directed by architect or owner.
- E. EPS board manufacturer's certificate of compliance with ASTM E 2430-05, Prepare and submit project specific details.
- F. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Product Data for Credit IEQ 4.1: For sealants, documentation including printed statement of VOC content.

1.7 QUALITY ASSURANCE

- A. Manufacturer requirements
 - 1. Stucco products manufacturer for a minimum of twenty (20) years.
 - 2. Stucco finish products manufactured under ISO 9001:2000 Quality System.
- B. Contractor requirements
 - 1. Licensed, insured and engaged in application of portland cement stucco for a minimum of three (3) years.
 - 2. Knowledgeable in the proper use and handling of Sto materials.

3. Employ skilled mechanics who are experienced and knowledgeable in portland cement stucco application, and familiar with the requirements of the specified work.
 4. Successful completion of minimum of three (3) projects of similar size and complexity to the specified project.
 5. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with Sto's published specifications and details and the project plans and specifications.
- C. Insulation board manufacturer requirements
1. Recognized by Sto as capable of producing insulation board to meet system requirements, and hold a valid licensing agreement with Sto.
 2. Listed by an approved agency. Label insulation board with information required by Sto, the approved listing agency, and the applicable building code.
- D. Mock-up Testing
1. Construct full-scale mock-up of typical stucco/window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E 283, E 331 and E 330, respectively, through independent laboratory. Mock-up shall comply with requirements of project specifications. Where mock-up is tested at job site maintain approved mock-up at site as reference standard. If tested off-site accurately record construction detailing and sequencing of approved mock-up for replication during construction.
- E. Inspections
1. Provide independent third party inspection where required by code or contract documents.
 2. Conduct inspections in accordance with code requirements and contract documents.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.
- B. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32°C). Store away from direct sunlight.
- C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

1.9 PROJECT/SITE CONDITIONS

- A. Comply with ASTM C 926 requirements.
- B. Maintain ambient and surface temperatures above 40°F (4°C) during application and for 24 hours after set of stucco.
- C. Provide supplementary heat for installation in temperatures less than 40°F (4°C) such that temperatures are maintained as in 1.09A. Prevent concentration of heat on uncured stucco and vent fumes and other products of combustion to the outside to prevent contact with stucco.

- D. Prevent uneven or excessive evaporation of moisture from stucco during hot, dry or windy weather. For installation under any of these conditions provide special measures to properly moist cure the stucco.
- E. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.10 COORDINATION/SCHEDULING

- A. For stud wall assemblies, commence the stucco installation after completion of all floor, roof construction and other construction that imposes dead loads on the walls to prevent excessive deflection (and potential cracking) of the stucco.
- B. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall and provide sill flashing. Coordinate installation of moisture barrier with window and door installation to provide weather proofing of the structure and to prevent moisture infiltration and excess air infiltration.
- C. Install window and door head flashing immediately after windows and doors are installed.
- D. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.
- E. Install sealant immediately after installation of the stucco and when finish coatings are dry.
- F. Attach penetrations through stucco into structural support and provide water tight seal at penetrations.

1.11 WARRANTY

- A. Provide manufacturer's standard warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Sto Corp.
- B. Provide stucco, primer and finish from single source manufacturer.

2.2 MOISTURE BARRIER

- A. Minimum No. 15 vapor permeable asphalt saturated felt in compliance with ASTM D 226, Grade D or equal.

2.3 LATH

- A. Minimum No. 20 gauge 1 inch self-furred galvanized steel woven wire fabric in compliance with ASTM C 1032, or minimum 2.4 lb/yd² galvanized steel diamond mesh metal lath in compliance with ASTM C 847 (recommended for residential and light commercial construction).

2.4 MECHANICAL FASTENERS

- A. Appropriate non-corroding fasteners, depending on the type framing or substrate:

1. Wood Framing--minimum 11 gauge, 7/16 inch diameter head galvanized roofing nails with minimum $\frac{3}{4}$ inch (19mm) penetration into studs or minimum #8 Type S wafer head fully threaded corrosion resistant screws with minimum $\frac{3}{4}$ inch penetration into studs.
- B. Tie Wire—18 gauge galvanized and annealed low-carbon steel in compliance with ASTM A 641 with Class I coating.

2.5 ACCESSORIES

- A. Weep screed, casing bead, corner bead, corner lath, expansion and control joint accessories. All accessories shall meet the requirements of ASTM C 1063 and its referenced documents:
 1. PVC plastic in compliance with ASTM D 1784, cell classification 13244C.
 2. Zinc in compliance with ASTM B 69.
- B. All accessories shall have perforated or expanded flanges and shall be designed with grounds for the specified thickness of stucco.

2.6 JOB MIXED INGREDIENTS

- A. Water—clean and potable.
- B. Clean, well graded sand free of deleterious materials in compliance with ASTM C 897 or ASTM C144.
- C. Stucco Admixture (optional, used to provide StoPowerwall Stucco Polymer Modified)
 1. Sto Bonding Agent and Admixture—copolymer admixture for StoPowerwall Stucco.

2.7 STUCCO

- A. StoPowerwall Stucco Polymer Modified — polymer modified, factory proportioned, fiber reinforced portland cement based stucco, field mixed with graded sand, water and Sto Bonding Agent and Admixture.

2.8 FOAM BUILD-OUTS

- A. Adhesive
 1. Sto BTS[®] Plus—one component, polymer modified, cement based high build adhesive.
- B. Insulation Board
 1. Sto EPS Insulation Board--nominal 1.0 lb/ft³ Expanded Polystyrene (EPS) Insulation Board in compliance with ASTM C 578 Type I requirements, and EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board. (Note: minimum required thickness is 1 inch [25 mm] and maximum allowable thickness is typically 4 inches [100 mm] for noncombustible type construction unless thicker dimensions are approved by the code official).
- C. Reinforcing Mesh (select one):
 1. Sto Detail Mesh--nominal 4.2 oz/yd², flexible, symmetrical, interlaced open-weave glass fiber fabric treated with alkaline resistant coating for compatibility with Sto materials.
- D. Base Coats:

1. Sto BTS® *Plus*—one-component polymer modified cement based high build base coat with less than 33 percent portland cement content by weight and capable of achieving minimum 1/16 inch thickness in one pass.
2. Sto Flexyl—fiber reinforced acrylic based waterproof base coat mixed with portland cement (for use as a waterproof base coat to waterproof foundations, parapets, splash areas, trim and other projecting architectural features).

2.9 PRIMER

- A. Sto Primer Sand—acrylic based tinted primer.

2.10 FINISH COAT

- A. Sto elastomeric or silicone enhanced elastomeric textured wall finish

2.11 MIXING

- A. Sto Bonding Agent and Admixture—no mixing required when used as a bonding agent. Use at full strength. Shake sealed container before use to a homogeneous consistency. Sto Bonding Agent and Admixture may be used as an admixture in the stucco mixture. When used in this way, dilute 1 part Sto Bonding Agent and Admixture to 3 parts clean water used as part of the mixing water for the stucco.
- B. StoPowerwall Stucco Polymer Modified – Dilute Sto Bonding Agent and Admixture with 3 parts water to one part Sto Bonding Agent and Admixture by volume by adding clean, potable water to a clean mixing pail and mixing with a high speed electric drill mixer. Follow normal mix ratio and procedures for mixing StoPowerwall Stucco (2.12B), except use diluted Sto Bonding Agent and Admixture in lieu of water.
- C. Adhesive and Base Coats for Foam Build-outs: (select either a or b)
 1. Sto BTS *Plus* --mix ratio with water: 5-6.5 quarts (4.7-6.2 L) of water per 47 pound (21.3 kg) bag of Sto-BTS Plus. Mix ½ bag at a time by pouring 2.5-3.25 quarts (1.4-1.9L) of clean potable water into a clean mixing pail. Add approximately ½ bag of Sto BTS-Plus, mix to a uniform consistency and allow to set for approximately 5 minutes. Adjust mix if necessary with additional Sto BTS *Plus* or water and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent. Do not exceed maximum amount of water in mix ratio.
 2. Sto Flexyl--mix ratio with Portland cement: 1:1 ratio by weight. Pour Sto Flexyl into a clean mixing pail. Add Portland cement, mix to a uniform consistency and allow to set for approximately five minutes. Adjust mix if necessary with additional Sto Flexyl and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent.
- D. Primer--mix with a clean, rust-free high speed mixer to a uniform consistency.
- E. Finish--mix with a clean, rust-free high speed mixer to a uniform consistency. A small amount of water may be added to adjust workability. Limit addition of water to amount needed to achieve the finish texture.
- F. Mix only as much material as can readily be used.
- G. Do not use anti-freeze compounds or other additives.

PART 3 EXECUTION

3.1 ACCEPTABLE INSTALLERS

- A. Pre-qualify under Quality Assurance requirements of this specification (section 1.7.B).

3.2 EXAMINATION

- A. Inspect surfaces for:
 - 1. Contamination—algae, chalkiness, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew or other foreign substances.
 - 2. Surface absorption and chalkiness.
 - 3. Cracks—measure crack width and record location of cracks.
 - 4. Damage and deterioration.
 - 5. Moisture damage—record any areas of moisture damage.
- B. Inspect sheathing application for compliance with applicable requirement:
 - 1. Exterior Gypsum Sheathing—GA-253
 - 2. Glass Mat Faced Gypsum Sheathing—refer to manufacturer's instructions.
 - 3. Exterior Grade and Exposure 1 wood based sheathing—APA Engineered Wood Association E 30.
 - a. Note: wood-based sheathing must be gapped 1/8 inch at edge and end joints to prevent cracking in the stucco.
- C. Report deviations from the requirements of project specifications or other conditions that might adversely affect the stucco installation to the General Contractor.

3.3 SURFACE PREPARATION

- A. Gypsum Sheathing in compliance with ASTM C1396, Glass Mat Faced Gypsum Sheathing in compliance with ASTM C 1177, and Exterior or Exposure 1 wood-based sheathing:
 - 1. Verify installation of sheathing in compliance with applicable requirement.
 - 2. Protect the substrate with a moisture barrier as required by the applicable code and install lath and accessories as in 3.4 B1—B6.

3.4 INSTALLATION

- A. Installation over frame construction with sheathing:
 - 1. Weep Screed Installation
 - a. Install foundation weep screed at the base of the wall securely to framing with the appropriate fastener. Locate foundation weep screed so that it overlaps the joint between the foundation and framing by a minimum of 1 inch (25 mm). Locate the foundation weep screed minimum 4 inches (100 mm) above earth grade, 2 inches (51 mm) above finished grade (paved surfaces, for example).
 - 2. Weather Protection
 - a. Protect sills of rough openings with barrier membrane.
 - b. Apply moisture barrier in compliance with the applicable building code. Wrap paper into rough opening and lap over barrier membrane at jambs. Lap paper over foundation weep screed attachment flange and window/door head flashings. Refer to Sto Details.
 - 3. Casing Bead and Expansion Joint Installation
 - a. Install casing beads at stucco terminations—doors, windows and other through wall penetrations. Install expansion joints (or back-to-back casing beads) at building expansion joints, where the stucco is to be installed over dissimilar construction or substrates, at changes in building height, at floor lines, columns, and cantilevered areas. Install one piece expansion joints at corners of windows, doors, and similar through wall penetrations, and every 144 ft² (13 m²). Install full accessory pieces where possible and avoid small pieces. Seal adjoining pieces by embedding ends in sealant. Abut

- horizontal into vertical joint accessories. Attach at no more than 7 inches (178 mm) into framing with appropriate fasteners.
4. Lath Installation
 - a. Diamond Mesh Metal Lath
 - i.* General--install metal lath with the long dimension at right angles to structural framing. Terminate lath at expansion joints. Do not install continuously beneath joints.
 - ii.* Seams/Overlaps--overlap side seams minimum 1/2 inch and end seams minimum 1 inch. Stagger end seams. Overlap casing beads and expansion joints minimum 1 inch over narrow wing accessories, minimum 2 inches over expanded flange accessories. Do not install lath continuously beneath expansion joints.
 - iii.* Attachment--fasten securely through sheathing into structural framing at 7 inches on center maximum vertically and 16 inches on center horizontally*. Wire tie at no more than 9 inches on center at: side laps, accessory overlaps, and where end laps occur between supports.
 - b. Woven wire fabric lath—follow installation as for metal lath except overlap all seams by one mesh minimum.
 - c. Paper-backed lath—follow installation as for metal lath. Lap lath over lath, not paper to lath overlap. For horizontal overlaps the paper backing must lap shingle style behind the lath to lath overlap.
 5. One Piece Expansion Joint Installation
 - a. Install one piece expansion joints over lath at through wall penetrations, for example, above and below doors or windows (unless another type of expansion joint is already provided at these locations or one piece expansion joints are already provided as in 3.04 B3a). Install one piece expansion joints over lath every 144 ft² (unless already provided as in 3.04 B3a.). Wire tie one piece expansion joints to lath at no more than 7 inches on center. Make certain lath is discontinuous beneath joints.
 6. Inside and Outside Corners
 - a. Install corner lath at inside corners and corner bead at outside corners over lath. Attach through lath into framing at no more than 7 inches (178 mm) on center with appropriate fasteners.
 7. Stucco Installation*
 - a. Scratch Coat: apply stucco with sufficient pressure to key into and embed the metal lath. Apply sufficient material, 3/8—1/2 inch, to cover the metal lath and to permit scoring the surface. Score the stucco upon completion of each panel in preparation for a second coat. Score horizontally.
 - b. Brown Coat: as soon as the first coat is firm enough to receive the second coat without damage, apply the second coat. Alternatively, moist cure the first coat up to 48 hours and dampen the scratched surface with water immediately before applying the second coat. Apply the second coat with sufficient pressure to ensure intimate contact with the first coat and as needed to bring the stucco to a uniform thickness that matches the grounds of the accessories. Use a rod or straight edge to bring the surface to a true, even plane. Fill depressions in plane with stucco. Final thickness of stucco shall be minimum 1/2 inch, maximum 7/8 inch. Refer to 1.4H.
 - c. After the stucco has become slightly firm float the surface lightly with a darby or wood float to densify the surface and to provide a smooth, even surface.
 - d. Moist cure after the stucco has set by lightly fogging for at least 48 hours. Fog as frequently as required during the 48 hour period to prevent loss of moisture from the stucco. Avoid eroding the stucco surface with excess moisture. If relative humidity exceeds 75% the frequency of moist curing can be diminished.

- B. Foam Build-Outs
1. Where foam build-outs terminate at a dissimilar material such as a window, door or other non-stucco surface, backwrap the foam build-out by installing detail mesh onto the terminating edge of the stucco. Embed the mesh in the foam adhesive. Allow the mesh to dangle until the backwrapping procedure is completed (C4).
 2. Install foam build-outs directly over hardened stucco with cementitious EIFS adhesive (see 2.09.D). Apply adhesive with the appropriate size notched trowel to the back of the insulation board and immediately place build-out in the proper location on the wall. Press firmly into place.
 3. After the adhesive has cured sufficiently to hold the build-out firmly in place, rasp the entire foam surface smooth.
 4. Complete the backwrapping procedure by applying the cementitious EIFS base coat (see 2.09.D) to the exposed edges of the foam build-out and minimum 2-1/2 inches onto the face. Pull the backwrap mesh around the foam build-out and fully embed it into the base coat. Use a corner trowel for neat straight corners.
 5. Apply the cementitious base coat to the foam build-out and approximately 3 inches onto the adjacent stucco surfaces to an approximate thickness of 1/8 inch. Immediately embed the reinforcing mesh in the wet base coat. Trowel from the center to the edges of the mesh to avoid wrinkles and remove excess base coat. Overlap mesh seams minimum 2-1/2 inches. Overlap mesh onto adjacent stucco wall surfaces minimum 2-1/2 inches at terminations of the foam build-out and feather onto the stucco wall surface.
- C. Primer Installation
1. Sto Hot Prime—Moist cure stucco for a minimum of 48 hours. Apply primer evenly with brush, roller or proper spray equipment over the clean, dry stucco and foam build-outs, and allow to dry before applying finish.
 2. Sto Primer Sand—Moist cure stucco for a minimum of 48 hours. Wait until stucco is 28 days old or the pH level of the surface is below 10 before applying primer and allow to dry before applying finish.
- D. Finish Installation
1. Apply finish to primed stucco and foam build-outs when dry. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:
 - a. Avoid application in direct sunlight.
 - b. Apply finish in a continuous application, and work a wet edge towards the unfinished wall area. Work to an architectural break in the wall before stopping to avoid cold joints.
 - c. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying. Adjustments in the scheduling of work may be required to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule and provide protection.
 - d. Float "R" (rilled texture) finishes with a plastic float to achieve their rilled texture.
 - e. Do not install separate batches of finish side-by-side.
 - f. Do not apply finish into or over joints or accessories. Apply finish to outside face of wall only.
- E. Control Joints
1. Provide control joints in stucco. A horizontal line is needed at the floor line whenever stucco extends more than 1 floor in height. In addition, provide vertical control joints at a maximum of 18', or to limit stucco surface area to 144 square

feet. Provide shop drawing for approval indicating proposed locations of control joints.

3.5 PROTECTION

- A. Provide protection of installed materials from water infiltration into or behind them.
- B. Provide protection of installed stucco from dust, dirt, precipitation, and freezing.
- C. Provide protection of installed primer and finish from dust, dirt, precipitation, freezing and continuous high humidity until fully dry.

END OF SECTION 09 24 00

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Exterior gypsum board for ceilings and soffits.
 - 3. Tile backing panels.
- B. Related Requirements:
 - 1. Section 06 16 00 "Sheathing" for gypsum sheathing for exterior walls.
 - 2. Section 09 22 16 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.
 - 3. Section 09 21 16.23 "Gypsum Board Shaft Wall Assemblies" for metal shaft-wall framing, gypsum shaft liners, and other components of shaft-wall assemblies.
 - 4. Section 09 30 00 "Tiling" for cementitious backer units installed as substrates for ceramic tile.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Product Data for Credit IEQ 4.1: For adhesives used to laminate gypsum board panels to substrates, documentation including printed statement of VOC content.
- C. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in **12-inch-** long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than **<Insert number>** percent.
- B. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CertainTeed Corp.
 - 2. Georgia-Pacific Gypsum LLC.
 - 3. Lafarge North America Inc.
 - 4. National Gypsum Company.
 - 5. USG Corporation.
- B. Gypsum Wallboard: ASTM C 1396/C 1396M.
 - 1. Thickness: **1/2 inch**.
 - 2. Long Edges: Tapered.
- C. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Thickness: **5/8 inch**.
 - 2. Long Edges: Tapered.
- D. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
 - 1. Thickness: **1/2 inch**.
 - 2. Long Edges: Tapered.
- E. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M, Level 2.
 - 1. Core: As indicated on Drawings.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

- F. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
 - 1. Core: As indicated.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 SPECIALTY GYPSUM BOARD

- A. Gypsum Board, Type C: ASTM C 1396/C 1396M. Manufactured to have increased fire-resistive capability.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corp.; ProRoc Type C.
 - b. Georgia-Pacific Gypsum LLC; Fireguard C.
 - c. Lafarge North America Inc.; Firecheck Type C.
 - d. National Gypsum Company; Gold Bond Fire-Shield C.
 - e. USG Corporation; Firecode C Core.
 - 2. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
 - 3. Long Edges: Tapered.
- B. Glass-Mat Interior Gypsum Board: ASTM C 1658/C 1658M. With fiberglass mat laminated to both sides. Specifically designed for interior use.
 - 1. Products: Subject to compliance with requirements:
 - a. Georgia-Pacific Gypsum LLC; DensArmour Plus.
 - 2. Core: **5/8 inch**, Type X.
 - 3. Long Edges: Tapered.
 - 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

- A. Exterior Gypsum Soffit Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corp.
 - b. Georgia-Pacific Gypsum LLC.
 - c. Lafarge North America Inc.
 - d. National Gypsum Company.
 - e. USG Corporation.
 - 2. Core: **5/8 inch**, Type X.
- B. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corp.; GlasRoc Sheathing.
 - b. Georgia-Pacific Gypsum LLC; Dens-Glass Gold.
 - c. National Gypsum Company; Gold Bond, e(2)XP.
 - d. USG Corporation; Securock Glass Mat Sheathing.
 - 2. Core: **5/8 inch**, Type X.

2.6 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corp.; GlasRoc Tile Backer.
 - b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.

2. Core: **5/8 inch**, Type X.
 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- B. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Corp.; FiberCement BackerBoard.
 - b. James Hardie Building Products, Inc.; Hardiebacker.
 - c. National Gypsum Company, Permapase Cement Board.
 - d. USG Corporation; DUROCK Cement Board.
 2. Thickness: As indicated.
 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- C. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corp.
 - b. Georgia-Pacific Gypsum LLC.
 - c. Lafarge North America Inc.
 - d. USG Corporation.
 2. Core: **1/2 inch**, regular type or Type C as required by fire-resistance-rated assembly indicated on Drawings.

2.7 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. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
- B. Exterior Trim: ASTM C 1047.
1. Material: Hot-dip galvanized steel sheet, plastic, or rolled zinc.
 2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.
- C. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fry Reglet Corp.
 - b. Gordon, Inc.
 - c. Pittcon Industries.
 2. Aluminum: Alloy and temper with not less than the strength and durability properties of **ASTM B 221**, Alloy 6063-T5.

3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.8 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 1. Interior Gypsum Board: Paper.
 2. Exterior Gypsum Soffit Board: Paper.
 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 4. 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 Exterior Applications:
 1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
 2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.
- E. Joint Compound for Tile Backing Panels:
 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
 2. Cementitious Backer Units: As recommended by backer unit manufacturer.
 3. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.9 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from **0.033 to 0.112 inch** thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

- D. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
 - b. Grabber Construction Products; Acoustical Sealant GSC.
 - c. Pecora Corporation; AC-20 FTR.
 - d. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
 - e. USG Corporation; SHEETROCK Acoustical Sealant.
 - 2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- E. Thermal Insulation: As specified in Section 07 21 00 "Thermal Insulation."
- F. Vapor Retarder: As specified in Section 07 21 00 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than **1/16 inch** of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than **8 sq. ft.** in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow **1/4- to 3/8-inch-** wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide **1/4- to 1/2-inch-** wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.
- J. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 1. Wallboard Type: As indicated on Drawings.
 2. Type X: Where required for fire-resistance-rated assembly.
 3. Ceiling Type: Ceiling surfaces.
 4. Abuse-Resistant Type: As indicated on Drawings.
 5. Moisture- and Mold-Resistant Type: As indicated on Drawings.
 6. Type C: Where required for specific fire-resistance-rated assembly indicated.
 7. Glass-Mat Interior Type: As indicated on Drawings.
- B. Single-Layer Application:
 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application:
 1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, **16 inches** minimum,

from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-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.
1. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.4 APPLYING EXTERIOR GYPSUM PANELS FOR CEILINGS AND SOFFITS

- A. Apply panels perpendicular to supports, with end joints staggered and located over supports.
 1. Install with **1/4-inch** open space where panels abut other construction or structural penetrations.
 2. Fasten with corrosion-resistant screws.

3.5 APPLYING TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at showers, tubs, and where indicated. Install with **1/4-inch** gap where panels abut other construction or penetrations.
- B. Cementitious Backer Units: ANSI A108.11, at [showers, tubs, and where indicated] [locations indicated to receive tile].
- C. Water-Resistant Backing Board: Install where indicated with **1/4-inch** gap where panels abut other construction or penetrations.
- D. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.6 INSTALLING TRIM ACCESSORIES

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

2. LC-Bead: Use at exposed panel edges.

E. Aluminum Trim: Install in locations indicated on Drawings.

3.7 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

2. Level 2: Panels that are substrate for tile.

3. Level 3: Where indicated on Drawings.

4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

5. Level 5: Where indicated on Drawings.

a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

G. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.8 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

SECTION 09 30 00 - TILING

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. Ceramic tile.
 - 2. Glass tile
 - 3. Waterproof membrane.
 - 4. Crack isolation membrane.
 - 5. Tile backing panels.
 - 6. Metal edge strips.
- B. Related Sections:
 - 1. Division 07 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
 - 2. Division 09 Section "Gypsum Veneer Plastering" for cementitious backer units.
 - 3. Division 09 Section "Gypsum Board" for cementitious backer units.
 - 4. Division 09 Section "Stone Tiling."

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PERFORMANCE REQUIREMENTS

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

1.5 ACTION SUBMITTALS

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

1. Product Data for Credit IEQ 4.1: For adhesives and sealants, documentation including printed statement of VOC content.
 2. Product Data for Credit IEQ 4.3: For adhesives and grouts, documentation including printed statement of VOC content.
 3. Product Data for Credit IEQ 4.3: For tile floors, documentation from an independent testing agency indicating compliance with the FloorScore Standard.
- C. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- D. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- E. Samples for Verification:
1. Full-size units of each type and composition of tile and for each color and finish required.
 2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least **12 inches** square, but not fewer than 4 tiles. Use grout of type and in color or colors approved for completed Work.
 3. Full-size units of each type of trim and accessory for each color and finish required.
 4. Metal edge strips in **6-inch** lengths.
- 1.6 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For qualified Installer.
- B. Product Certificates: For each type of product, signed by product manufacturer.
- C. Material Test Reports: For each tile-setting and -grouting product and special purpose tile.
- 1.7 MATERIALS MAINTENANCE SUBMITTALS
- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.
- 1.8 QUALITY ASSURANCE
- A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.
1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:

1. Waterproof membrane.
2. Crack isolation membrane.
3. Joint sealants.
4. Cementitious backer units.
5. Metal edge strips.

- D. Preinstallation Conference: Conduct conference at Project site.
1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.10 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.
- C. FloorScore Compliance: Tile for floors shall comply with requirements of FloorScore Standard.
- D. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

- F. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.2 TILE PRODUCTS

A. Ceramic Tile:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings ID 0.10:
 - a. Daltile; Division of Dal-Tile International Inc.
 - 1) Tile Type CT-1: Polished
 - 2) Tile Type CT-2: Un-Polished
 - 3) Tile Type CT-3: Unpolished
- 2. Module Size: As indicated on Drawing Sheet ID 0.10.
- 3. Thickness: **1/4 inch**.
- 4. Tile Color and Pattern: Match Architect's sample.
- 5. Grout Color: As selected by Architect from manufacturer's full range.
- 6. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as indicated on the Drawings, selected from manufacturer's standard shapes.
 - a. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from **1/2 to 1/4 inch** across nominal **4-inch** dimension.

B. Glass Tile:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings ID 0.10:
 - a. American Olean
 - 1) Tile Type GL1
- 1. Module Size: As indicated on Drawing Sheet ID 0.10.
- 2. Thickness: **1/4 inch**.
- 3. Tile Color and Pattern: Match Architect's sample.
- 4. Grout Color: White.
- 5. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as indicated on the Drawings, selected from manufacturer's standard shapes.
- 6. Contractor to use glass tile adhesive, tile to be back buttered and trowel marks must not be evident; prior to full installation Architect shall approve mock-up.

- C. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from **1/2 to 1/4 inch** across nominal **4-inch** dimension.

- D. Accessories: Provide vitreous china accessories of type and size indicated, suitable for installing by same method as adjoining wall tile.

- 1. One soap holder with grab handle for each shower and tub indicated.
- 2. One paper holder at each water closet.
- 3. Color and Finish: Match adjoining glazed wall tile.

2.3 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

- B. PVC Sheet: Two layers of PVC sheet heat-fused together and to facings of nonwoven polyester; **0.040-inch** nominal thickness.
- C. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; **0.008-inch** nominal thickness.
- D. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.
- E. Urethane Waterproofing and Tile-Setting Adhesive: One-part, liquid-applied urethane, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), in a consistency suitable for trowel application and intended for use as both waterproofing and tile-setting adhesive in a two-step process.

2.4 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. PVC Sheet: Two layers of PVC sheet heat-fused together and to facings of nonwoven polyester; **0.040-inch** nominal thickness.
- C. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; **0.008-inch** nominal thickness.
- D. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.
- E. Latex-Portland Cement: Flexible mortar consisting of cement-based mix and latex additive.

2.5 SETTING MATERIALS

- A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.
 - 1. Cleavage Membrane: Asphalt felt, ASTM D 226, Type I (No. 15); or polyethylene sheeting, ASTM D 4397, **4.0 mils** thick.
 - 2. Reinforcing Wire Fabric: Galvanized, welded wire fabric, **2 by 2 inches** by **0.062-inch** diameter; comply with ASTM A 185 and ASTM A 82 except for minimum wire size.
 - 3. Expanded Metal Lath: Diamond-mesh lath complying with ASTM C 847.
 - a. Base Metal and Finish for Interior Applications: Uncoated or zinc-coated (galvanized) steel sheet, with uncoated steel sheet painted after fabrication into lath.
 - b. Base Metal and Finish for Exterior Applications: Zinc-coated (galvanized) steel sheet.
 - c. Configuration over Studs and Furring: Flat.
 - d. Configuration over Solid Surfaces: Self furring.
 - e. Weight: **3.4 lb/sq. yd.**
 - 4. Latex Additive: Manufacturer's standard water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement and aggregate mortar bed.
- B. Dry-Set Portland Cement Mortar (Thin Set): ANSI A118.1.
 - 1. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.1.

- C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
 - 1. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
 - 2. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive at Project site.
 - 3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.
- D. Medium-Bed, Latex-Portland Cement Mortar: Comply with requirements in ANSI A118.4. Provide product that is approved by manufacturer for application thickness of **5/8 inch**.
 - 1. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
 - 2. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive at Project site.

2.6 GROUT MATERIALS

- A. Standard Cement Grout: ANSI A118.6.
- B. Polymer-Modified Tile Grout: ANSI A118.7.
 - 1. Polymer Type: Ethylene vinyl acetate or acrylic additive, in dry, redispersible form, prepackaged with other dry ingredients.
 - 2. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.
- C. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D.
 - 1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to **140 deg F** and **212 deg F**, respectively, and certified by manufacturer for intended use.
- D. Grout for PregROUTed Tile Sheets: Same product used in factory to pregrout tile sheets.

2.7 ELASTOMERIC SEALANTS

- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section "Joint Sealants."
 - 1. Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
- D. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.

- E. Chemical-Resistant Sealants: For chemical-resistant floors, provide chemical-resistant elastomeric sealant of type recommended and produced by chemical-resistant mortar and grout manufacturer for type of application indicated, with proven service record and compatibility with tile and other setting materials, and with chemical resistance equivalent to mortar/grout.

2.8 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
- C. Temporary Protective Coating: Product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
 - 1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F per ASTM D 87.
 - 2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- E. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.
- F. Glass tile adhesive: Laticrete Glass Tile Adhesive

2.9 MIXING MORTARS AND GROUT

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

2. Verify that concrete substrates for tile floors installed with bonded mortar bed or thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

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

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped **1/4 inch per foot** toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 1. For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:
 - a. Exterior tile floors.
 - b. Tile floors in wet areas.
 - c. Tile swimming pool decks.
 - d. Tile floors in laundries.
 - e. Tile floors composed of tiles **8 by 8 inches** or larger.
 - f. Tile floors composed of rib-backed tiles.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

- D. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- E. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - 1. Paver Tile: **1/4 inch.**
- F. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- G. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
- H. Metal Edge Strips: Install [at locations indicated] [where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile] [where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated].
- I. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 GLASS TILE PANEL INSTALLATION

- A. Install glass tile according to manufacturer's written instructions for type of application indicated. Use glass tile adhesive for bonding material unless otherwise directed in manufacturer's written instructions to include full back butter of each tile sheet and trowel marks must not be evident.

3.5 TILE BACKING PANEL INSTALLATION

- A. Install cementitious backer units and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

3.6 WATERPROOFING INSTALLATION

- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.7 CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.8 CLEANING AND PROTECTING

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

3.9 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:
 - 1. Tile Installation F111: Cement mortar bed (thickset) with cleavage membrane; TCA F111 and ANSI A108.1C.
 - a. Thin-Set Mortar for Cured-Bed Method: Medium-bed, latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
 - 2. Tile Installation F112: Cement mortar bed (thickset) bonded to concrete; TCA F112 and ANSI A108.1C.
 - a. Thin-Set Mortar for Cured-Bed Method: Medium-bed, latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
 - 3. Tile Installation F113: Thin-set mortar; TCA F113.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Water-cleanable epoxy grout.
 - 4. Tile Installation F114: Cement mortar bed (thickset) with cleavage membrane; epoxy grout; TCA F114 and ANSI A108.1B.
 - a. Thin-Set Mortar for Cured-Bed Method: Medium-bed, latex- portland cement mortar.
 - b. Grout: Water-cleanable epoxy grout.
 - 5. Tile Installation F115: Thin-set mortar; epoxy grout; TCA F115.
 - a. Thin-Set Mortar: Latex- portland cement mortar.

- b. Grout: Water-cleanable epoxy grout.
 - 6. Tile Installation F121: Cement mortar bed (thickset) on waterproof membrane; TCA F121 and ANSI A108.1C.
 - a. Thin-Set Mortar for Cured-Bed Method: Medium-bed, latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
- B. Interior Floor Installations, Wood Subfloor:
 - 1. Tile Installation F121: Cement mortar bed (thickset) on waterproof membrane; TCA F121 and ANSI A108.1C.
 - a. Thin-Set Mortar for Cured-Bed Method: Medium-bed, latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded Water-cleanable epoxy grout.
 - 2. Tile Installation F141: Cement mortar bed (thickset) with cleavage membrane; TCA F141 and ANSI A108.1C.
 - a. Thin-Set Mortar for Cured-Bed Method: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
 - 3. Tile Installation F144: Thin-set mortar on cementitious backer units or fiber cement underlayment; TCA F144.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
- C. Bathtub/Shower Wall Installations, Wood Studs or Furring:
 - 1. Tile Installation B412: Thin-set mortar on cementitious backer units or fiber cement underlayment; TCA B412.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Polymer-modified unsanded grout.
- D. Glass Tile Wall Installations:
 - 1. Tile Installation: Tile adhesive on cementitious backer units or fiber cement underlayment; TCA as recommended by the manufacturer for the indicated substrate.
 - a. Thin-Set Mortar: glass tile adhesive.
 - b. Grout: Polymer-modified unsanded grout.

END OF SECTION 09 30 00

SECTION 09 30 33 - STONE TILING

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. Dimension stone tile and related setting materials applied to floors.
- B. Related Sections:
 - 1. Section 03 30 00 "Cast-in-Place Concrete" for monolithic slab finishes specified for tile substrates.

1.3 DEFINITIONS

- A. Dimension Stone Tile: Modular stone units less than **3/4 inch** thick.
- B. Module Size: Actual tile size plus joint width.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit IEQ 4.1: For adhesives and sealants documentation including printed statement of VOC content.
 - 2. Product Data for Credit IEQ 4.3: For adhesives and grouts, documentation including printed statement of VOC content.
 - 3. Product Data for Credit IEQ 4.3: For stone tile floors, documentation from an independent testing agency indicating compliance with the FloorScore Standard.
- C. Samples for Initial Selection: For each type of grout indicated and accessories involving color selection.
- D. Samples for Verification:
 - 1. Full-size units of each type of stone tile in each finish required.
 - 2. Assembled Samples with grouted joints for each type of stone tile and for each finish required, at least **36 inches** square and mounted on a rigid panel. Use grout of type and in color(s) approved for completed Work.
 - 3. Metal edge strips in **6-inch** lengths.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For dimension stone tile to include in maintenance manuals.

1.7 MATERIALS MAINTENANCE SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Dimension Stone Tile: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.
 - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.8 QUALITY ASSURANCE

- A. Supplier Qualifications: A firm experienced in supplying products similar to those indicated for the Project and with a record of successful in-service performance.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 - 1. Joint sealants.
 - 2. Metal edge strips.
- D. Preinstallation Conference: Conduct conference at Project site.

1.9 DELIVERY, STORAGE, AND HANDLING

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

1.10 PROJECT CONDITIONS

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

1.11 SEQUENCING AND SCHEDULING

- A. Sequence stone tile installation with other work to minimize possibility of damage and soiling during remainder of construction period.
- B. Install stone tile and accessories only after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 STONE PRODUCTS

- A. Varieties and Sources: Subject to compliance with requirements, provide those indicated.
- B. FloorScore Compliance: Stone tile for floors shall comply with requirements of FloorScore Standard.
- C. Static Coefficient of Friction of Stone Tile for Floors: Provide products with values as determined by testing identical products per ASTM C 1028:
- D. Provide stone products that are free of defects impairing their function for use indicated, including cracks, seams, and starts.
- E. Stone Tile Type: as scheduled on Interior Drawings

2.2 TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A118.9 or ASTM C 1325, in maximum lengths available to minimize end-to-end butt joints.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. C-Cure; C-Cure Board 990.
 - b. Custom Building Products; Wonderboard.
 - c. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
 - d. USG Corporation; DUROCK Cement Board.
 - 2. Thickness: As indicated.
- B. Fiber-Cement Underlayment: ASTM C 1288, in maximum lengths available to minimize end-to-end butt joints.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Corp.; FiberCement Underlayment.
 - b. James Hardie; Hardiebacker.
 - 2. Thickness: As indicated.

2.3 SETTING MATERIALS

- A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.
 - 1. Cleavage Membrane: Asphalt felt, ASTM D 226, Type I (No. 15); or polyethylene sheeting, ASTM D 4397, **4.0 mils** thick.
 - 2. Reinforcing Wire Fabric: Galvanized, welded wire fabric, **2 by 2 inches** by **0.062 inch** in diameter; comply with ASTM A 185/A 185M and ASTM A 82/A 82M except for minimum wire size.
 - 3. Expanded Metal Lath: Diamond-mesh lath complying with ASTM C 847.
 - a. Base Metal and Finish for Interior Applications: Uncoated or zinc-coated (galvanized) steel sheet, with uncoated steel sheet painted after fabrication into lath.
 - b. Configuration over Solid Surfaces: Self furring.
 - c. Weight: **3.4 lb/sq. yd.**
 - 4. Latex Additive: Manufacturer's standard water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement and aggregate mortar bed.
- B. Dry-Set Portland Cement Mortar (Thin Set): ANSI A118.1.

1. 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:
 - a. Boiardi Products; a QEP company.
 - b. Bonsal American; an Oldcastle company.
 - c. Bostik, Inc.
 - d. C-Cure.
 - e. Custom Building Products.
 - f. Jamo Inc.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Southern Grouts & Mortars, Inc.
 - j. Summitville Tiles, Inc.
 - k. TEC; a subsidiary of H. B. Fuller Company.
- C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
1. 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:
 - a. Boiardi Products; a QEP company.
 - b. Bonsal American; an Oldcastle company.
 - c. Bostik, Inc.
 - d. C-Cure.
 - e. Custom Building Products.
 - f. Jamo Inc.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Mer-Kote Products, Inc.
 - j. Southern Grouts & Mortars, Inc.
 - k. Summitville Tiles, Inc.
 - l. TEC; a subsidiary of H. B. Fuller Company.
 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
- D. Medium-Bed, Latex-Portland Cement Mortar: Comply with requirements in ANSI A118.4. Provide product that is approved by manufacturer for application thickness of **5/8 inch**.
1. 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:
 - a. Bonsal American; an Oldcastle company.
 - b. Bostik, Inc.
 - c. C-Cure.
 - d. Custom Building Products.
 - e. Jamo Inc.
 - f. Laticrete International, Inc.
 - g. MAPEI Corporation.
 - h. Mer-Kote Products, Inc.
 - i. Southern Grouts & Mortars, Inc.
 - j. Summitville Tiles, Inc.
 - k. TEC; a subsidiary of H. B. Fuller Company.
 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
- E. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3., with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D.

1. 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:
 - a. Bonsal American; an Oldcastle company.
 - b. Bostik, Inc.
 - c. Custom Building Products.
 - d. Laticrete International, Inc.
 - e. MAPEI Corporation.
 - f. TEC; a subsidiary of H. B. Fuller Company.
- F. Organic Adhesive: ANSI A136.1, Type I, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D.
 1. 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:
 - a. Bonsal American; an Oldcastle company.
 - b. Bostik, Inc.
 - c. Custom Building Products.
 - d. DAP Inc.
 - e. Laticrete International, Inc.
 - f. MAPEI Corporation.
 - g. Summitville Tiles, Inc.
 - h. TEC; a subsidiary of H. B. Fuller Company.

2.4 GROUT MATERIALS

- A. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate as required to produce color indicated.
- B. Standard Cement Grout: ANSI A118.6.
 1. 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:
 - a. Bonsal American; an Oldcastle company.
 - b. Bostik, Inc.
 - c. Custom Building Products.
 - d. Laticrete International, Inc.
 - e. MAPEI Corporation.
 - f. Summitville Tiles, Inc.
 - g. TEC; a subsidiary of H. B. Fuller Company.
- C. Polymer-Modified Tile Grout: ANSI A118.7.
 1. 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:
 - a. Bonsal American; an Oldcastle company.
 - b. Bostik, Inc.
 - c. Custom Building Products.
 - d. Laticrete International, Inc.
 - e. MAPEI Corporation.
 - f. Summitville Tiles, Inc.
 - g. TEC; a subsidiary of H. B. Fuller Company.
 2. Polymer Type: Ethylene vinyl acetate or acrylic additive, in dry, redispersible form, prepackaged with other dry ingredients.

- D. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D.
 - 1. 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:
 - a. Bonsal American; an Oldcastle company.
 - b. Bostik, Inc.
 - c. Custom Building Products.
 - d. Laticrete International, Inc.
 - e. MAPEI Corporation.
 - f. Summitville Tiles, Inc.
 - g. TEC; a subsidiary of H. B. Fuller Company.

2.5 ELASTOMERIC SEALANTS

- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Section 07 92 00 "Joint Sealants" and that do not stain stone.
 - 1. Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D.
 - 2. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
- B. Colors: Provide colors of exposed sealants to match colors of grout in stone tile adjoining sealed joints unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior stone tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. DAP Inc.; 100 percent Silicone Kitchen and Bath Sealant.
 - b. Dow Corning Corporation; Dow Corning 786.
 - c. GE Silicones, a division of GE Specialty Materials; Sanitary 1700.
 - d. Laticrete International, Inc.; Latasil Tile & Stone Sealant.
 - e. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
 - f. Tremco Incorporated; Tremsil 600 White.
- D. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bostik, Inc.; Chem-Calk 550.
 - b. Degussa Building Systems; Sonneborn Sonolastic SL 2.
 - c. Pecora Corporation; Dynatrol II-SG or NR-200 Urexpan.
 - d. Sika Corporation; Sikaflex-2c SL.
 - e. Tremco Incorporated.; THC-900, THC-901, or Vulkem 245.

2.6 MISCELLANEOUS MATERIALS

- A. Trowelable Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

- B. Metal Edge Strips: Angle or L-shaped, height to match stone tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
 - 1. 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:
 - a. Blanke Corporation.
 - b. Ceramic Tool Company, Inc.
 - c. Schluter Systems L.P.
- C. Protective Coating: Liquid grout-release coating that is formulated to protect exposed surfaces of stone tile against adherence of mortar and grout; compatible with stone, mortar, and grout products; easily removable after grouting is completed without damaging grout or stone tile; and recommended for use as temporary protective coating for stone tile.
 - 1. Floor sealer complying with "Floor Sealer" Paragraph below may be used provided it is recommended by manufacturer for use as a grout release.
- D. Cleaner: A neutral cleaner capable of removing soil and residue without harming stone tile and grout surfaces, specifically approved for materials and installations indicated by stone tile producers and grout manufacturers.
- E. Floor Sealer: Colorless, stain- and slip-resistant sealer, not affecting color or physical properties of stone surfaces as recommended by stone tile producers for application indicated.
 - 1. 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:
 - a. Bostik, Inc.
 - b. Custom Building Products.
 - c. Hillyard, Inc.
 - d. HMK Stone Care System.
 - e. Summitville Tiles, Inc.

2.7 FABRICATION

- A. Facial Dimensions of Stone Tiles with Polished Faces: Do not vary facial dimensions from specified dimensions by more than plus or minus **1/64 inch**.
- B. Thickness of Stone Tiles with Polished Finish: Do not vary from specified thickness by more than plus or minus **1/32 inch**.
- C. Joint Surfaces: Except for specified beveled or eased edges if any, dress joint surfaces square for full depth of stone tile.
- D. Backs of Pieces: Gage units by dressing backs of pieces smooth and flat. When tested with a **24-inch** straightedge, gap shall not exceed **1/32 inch**.
 - 1. Natural-cleft stone need not be gaged if gap does not exceed **1/16 inch** when tested with a **24-inch** straightedge on backs of units.

2.8 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and with mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.

- C. Use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where stone tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed stone tile.
 - 1. Verify that substrates for setting stone tile are firm, dry, clean, and free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone, and that they comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for stone tile floors installed with bonded mortar bed or thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind stone tile has been completed.
 - 4. Verify that joints and cracks in stone tile substrates are coordinated with stone tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for stone tile floors installed with thin-set mortar with trowelable patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped **1/4 inch per foot** toward drains.
- C. Lay out stone tile patterns by marking joint lines on substrates to verify joint placement at edges, corners, doors, and other critical elements.
 - 1. Notify Architect seven days in advance of dates and times when layout will be done.
 - 2. Obtain Architect's approval of layout before starting stone tile installation.
- D. Lay out stone tiles on substrates or on an adjacent surface to establish placement of individual stone tiles for balance of color and pattern variations.
 - 1. Notify Architect seven days in advance of dates and times when layout will be done.
 - 2. Architect may relocate specific stone tiles with other stone tiles of same type and will determine final location of each stone tile within indicated patterns.
 - 3. Identify each stone tile with a temporary number marked on face of stone tile that corresponds with an identical number marked on a layout drawing, and obtain Architect's approval before starting stone tile installation.
- E. Field-Applied Temporary Protective Coating: If indicated under stone tile type or needed to prevent grout from staining or adhering to exposed stone tile surfaces, precoat them with

continuous film of temporary protective coating, taking care not to coat unexposed stone tile surfaces.

3.3 STONE TILE INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in stone tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods specified in stone tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:
 - a. Exterior stone tile floors.
 - b. Stone tile floors in wet areas.
 - c. Stone tile floors composed of stone tiles **8 by 8 inches** or larger.
- B. Wipe backs of stone tiles with a damp cloth to remove dirt and dust before units are installed.
- C. Extend stone tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of stone tile without marring visible surfaces. Carefully grind cut edges of stone tile abutting trim, finish, or built-in items for straight aligned joints. Fit stone tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap stone tile.
- E. Finish cut stone tile edges that will not be concealed by other construction by grinding and honing cut surfaces and beveling edges to match factory-fabricated edges unless otherwise indicated.
- F. Jointing Pattern: Lay stone tile in grid pattern unless otherwise indicated. Lay out stone tile work and center stone tile fields in both directions in each space or on each wall area. Lay out stone tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - 1. Where adjoining stone tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
- G. Lay out stone tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- H. Match stone tiles within each space by selecting tiles to achieve uniformity of color and pattern. Reject or relocate stone tiles that do not match color and pattern of adjacent tiles.
- I. Mix stone tiles to achieve a uniformly random distribution of color shadings and patterns.
- J. Pattern Orientation: For stone varieties with directional pattern, orient pattern as indicated.
- K. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and stone tile. Do not saw-cut joints after installing stone tiles.
 - 1. Where joints occur in concrete substrates, locate joints in stone tile surfaces directly above them.

2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."

- L. Metal Edge Strips: Install where exposed edge of stone tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of stone tile and no threshold is indicated.

3.4 TILE BACKING PANEL INSTALLATION

- A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

3.5 INSTALLATION TOLERANCES

- A. Variation in Surface Plane of Flooring: Do not exceed **1/8 inch in 10 feet** from level or slope indicated when tested with a **10-foot** straightedge.
- B. Variation in Plane between Adjacent Units (Lipping): Do not exceed the following differences between faces of adjacent units as measured from a straightedge parallel to stone tiled surface:
 1. Units with Polished Faces: **1/64 inch**.
- C. Variation in Joint Width: Do not vary joint thickness more than **1/16 inch** or one-fourth of nominal joint width, whichever is less.
- D. Hand-Tight Joints: Do not exceed **1/64 inch**.

3.6 ADJUSTING AND CLEANING

- A. Remove and replace material that is stained or otherwise damaged or that does not match adjoining stone tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean stone tile surfaces so they are free of foreign matter.
 1. Remove epoxy and latex-portland cement grout residue from stone tile as soon as possible.
 2. Clean grout smears and haze from stone tile according to stone tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by stone tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of stone tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 3. Remove temporary protective coating by method recommended by coating manufacturer and acceptable to stone tile and grout manufacturer. Trap and remove coating to prevent drain clogging. Do not remove floor sealer if used as protective coating.
- C. Apply sealer to cleaned stone tile flooring according to sealer manufacturer's written instructions.

3.7 PROTECTION

- A. Protect installed stone tile floors with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by stone tile manufacturer, apply coat of neutral protective cleaner to completed stone tile walls and floors.

- B. Prohibit foot and wheel traffic from stone tiled floors for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from stone tile surfaces.

3.8 INTERIOR STONE TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:
 - 1. Stone Tile Installation F114: Cement mortar bed (thickset) with cleavage membrane; epoxy grout; TCA F114 and ANSI A108.1B.
 - a. Bond Coat (Thin-Set Mortar) for Cured-Bed Method: Medium-bed, latex-Portland cement mortar.
 - b. Grout: Water-cleanable epoxy grout.

END OF SECTION 09 30 33

SECTION 09 64 00 - WOOD FLOORING

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. Factory-finished wood flooring.
 - 2. Reclaimed wood flooring

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit IEQ 4.1: For wood flooring installation adhesives, documentation including printed statement of VOC content.
 - 2. Product Data for Credit IEQ 4.3: For wood flooring installation adhesives, documentation including printed statement of VOC content.
 - 3. Product Data for Credit IEQ 4.3: For wood flooring, documentation from an independent testing agency indicating compliance with the FloorScore Standard.
- C. Shop Drawings: For each type of floor assembly and accessory. Include plans, elevations, sections, details, and attachments to other work. Include expansion provisions and trim details.
- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and finishes available for wood flooring.
- E. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately **12 inches** long and of same thickness and material indicated for the Work and showing the full range of normal color and texture variations expected.

1.4 MATERIALS MAINTENANCE SUBMITTALS

- 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. Wood Flooring: Equal to 1 percent of amount installed for each type of wood flooring indicated.

1.5 QUALITY ASSURANCE

- A. Hardwood Flooring: Comply with NOFMA's "Official Flooring Grading Rules" for species, grade, and cut.
 - 1. Certification: Provide flooring that carries NOFMA grade stamp on each bundle or piece.
- B. Softwood Flooring: Comply with WCLIB No. 17 grading rules for species, grade, and cut.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wood flooring materials in unopened cartons or bundles.
- B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet work is complete and dry.
- C. Store wood flooring materials in a dry, warm, ventilated, weathertight location.

1.7 PROJECT CONDITIONS

- A. Conditioning period begins not less than seven days before wood flooring installation, is continuous through installation, and continues not less than seven days after wood flooring installation.
 - 1. Environmental Conditioning: Maintain an ambient temperature between **65 and 75 deg F** and relative humidity planned for building occupants in spaces to receive wood flooring during the conditioning period.
 - 2. Wood Flooring Conditioning: Move wood flooring into spaces where it will be installed, no later than the beginning of the conditioning period.
 - a. Do not install flooring until it adjusts to relative humidity of, and is at same temperature as, space where it is to be installed.
 - b. Open sealed packages to allow wood flooring to acclimatize immediately on moving flooring into spaces in which it will be installed.
- B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.
- C. Install factory-finished wood flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. FloorScore Compliance: Wood floors shall comply with requirements of FloorScore Standard.

2.2 FACTORY-FINISHED WOOD FLOORING

- A. Wood Flooring:
 - 1. Refer to Room Finish Schedule on Interior Design drawings.

2.3 ACCESSORY MATERIALS

- A. Wood Underlayment: As specified in Section 06 10 00 "Rough Carpentry".
- B. Vapor Retarder: ASTM D 4397, polyethylene sheet not less than **8.0 mils** thick.
- C. Wood Flooring Adhesive: Mastic recommended by flooring and adhesive manufacturers for application indicated.
 - 1. Adhesive shall have a VOC content of not more than 100 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines: Wood Flooring".

- E. Thresholds and Saddles: To match wood flooring. Tapered on each side.
- F. Reducer Strips: To match wood flooring. **2 inches** wide, tapered, and in thickness required to match height of flooring.
- G. Cork Expansion Strip: Composition cork strip.
- H. Wood Air Vents and Grilles: To match wood flooring and in sizes and design indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of wood flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Concrete Slabs: Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
 - 1. Moisture Testing: Perform tests so that each test area does not exceed **200 sq. ft.**, and perform no fewer than two tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Perform anhydrous calcium chloride test per ASTM F 1869, as follows:
 - 1) Proceed with installation only after substrates have maximum moisture-vapor-emission rate of **3 lb of water/1000 sq. ft.** in 24 hours.
 - b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

3.2 PREPARATION

- A. Concrete Slabs: Grind high spots and fill low spots to produce a maximum **1/8-inch** deviation in any direction when checked with a **10-foot** straight edge.
- B. Remove coatings, including curing compounds, and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- C. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring".
- B. Wood Sleepers and Subfloor: Install according to requirements in Section 06 10 00 "Rough Carpentry".
- C. Wood Underlayment: Install according to requirements in Section 06 10 00 "Rough Carpentry".

- D. Provide expansion space at walls and other obstructions and terminations of flooring of not less than **3/4 inch**.
- E. Vapor Retarder: Comply with NOFMA's "Installing Hardwood Flooring" for vapor retarder installation and the following:
 - 1. Wood Flooring Nailed to Sleepers over Concrete: Install flooring over a layer of polyethylene sheet with edges overlapped over sleepers and turned up behind baseboards.
 - 2. Wood Flooring Installed Directly on Concrete: Install a layer of polyethylene sheet according to flooring manufacturer's written instructions.
- F. Solid-Wood Flooring: Blind nail or staple flooring to substrate.
 - 1. For flooring of face width more than **3 inches**:
 - a. Install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.
 - b. Install no fewer than two countersunk nails at each end of each piece, spaced not more than **16 inches** along length of each piece, in addition to blind nailing. Fill holes with matching wood filler.

3.4 PROTECTION

- A. Protect installed wood flooring during remainder of construction period with covering of heavy kraft paper or other suitable material. Do not use plastic sheet or film that might cause condensation.
 - 1. Do not move heavy and sharp objects directly over kraft-paper-covered wood flooring. Protect flooring with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

END OF SECTION 09 64 00

SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

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. Resilient base.
- B. Related Sections:
 - 1. Section 09 64 53 "Resilient Wood Flooring Assemblies" for resilient wood flooring.
 - 2. Section 09 68 13 "Tile Carpeting" for carpet tile flooring systems.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit IEQ 4.1: For adhesives, documentation including printed statement of VOC content.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than **12 inches** long, of each resilient product color, texture, and pattern required.
- E. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.4 MATERIALS MAINTENANCE SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than **10 linear feet** for every **500 linear feet** or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.6 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** or more than **90 deg F**.

1.7 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than **70 deg F** or more than **95 deg F**, in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than **55 deg F** or more than **95 deg F**.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

- A. Resilient Base:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allstate Rubber Corp.; Stoler Industries.
 - b. Armstrong World Industries, Inc.
 - c. Burke Mercer Flooring Products; Division of Burke Industries, Inc.
 - d. Endura Rubber Flooring; Division of Burke Industries, Inc.
 - e. Estrie Products International; American Biltrite (Canada) Ltd.
 - f. Flexco, Inc.
 - g. Johnsonite.
 - h. Mondo Rubber International, Inc.
 - i. Musson, R. C. Rubber Co.
 - j. Nora Rubber Flooring; Freudenberg Building Systems, Inc.
 - k. Roppe Corporation, USA.
 - l. VPI, LLC; Floor Products Division.
- B. Resilient Base Standard: ASTM F 1861.
 - 1. Material Requirement: Type TS (rubber, vulcanized thermoset) or Type TP (rubber, thermoplastic).
 - 2. Manufacturing Method: Group I (solid, homogeneous) or Group II (layered).
 - 3. Style: Cove (base with toe).
- C. Minimum Thickness: **0.125 inch**.
- D. Height: As indicated on Drawings.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed or preformed.
- G. Inside Corners: Job formed or preformed.
- H. Finish: As selected by Architect from manufacturer's full range.
- I. Colors and Patterns: Match Architect's sample.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - a. Cove Base Adhesives: Not more than 50 g/L.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. 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.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. 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.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END OF SECTION 09 65 13

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vinyl composition floor tile.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
- C. Samples: Full-size units of each color and pattern of floor tile required.
- D. Maintenance data.
- E. Data sheets confirming compliance with LEED Credit EQ 4.1 for adhesives.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.4 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive floor tile.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL COMPOSITION FLOOR TILE

- A. Products: Provide product(s) as scheduled on Drawings.
- B. Where indicated on drawings as vinyl plank flooring, provide Konecto Planks, manufactured by Metroflor Corporation, www.konectousa.com, Prestige Collection, species to be selected from manufacturer's standard choices.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.
 - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) to comply with LEED Credit EQ 4.1:
 - a. VCT and Asphalt Tile Adhesives: Not more than 50 g/L.
 - b. Rubber Floor Adhesives: Not more than 60 g/L.
- C. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions 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. 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.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 4. Moisture Testing: Perform tests recommended by floor covering manufacturer. Proceed with installation only after substrates pass testing.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are same temperature as space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.2 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor 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 another pattern is indicated on drawings.

- C. Match floor 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 with grain direction alternating in adjacent tiles (basket-weave pattern) unless noted otherwise on drawings.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- 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 tiles to flooring 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.

3.3 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.
 - 1. Apply one coat unless additional coats are recommended by manufacturer.
- C. Cover/protect floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 09 68 13 - TILE CARPETING

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 modular, tufted carpet tile.
- B. Related Requirements:
 - 1. Section 09 65 13 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.
 - 2. Section 09 68 16 "Sheet Carpeting."

1.3 PREINSTALLATION MEETINGS

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

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
 - 2. Include installation recommendations for each type of substrate.
- B. LEED Submittals:
 - 1. Product Data for Credit EQ 4.3:
 - a. For carpet tile, documentation indicating compliance with testing and product requirements of CRI's "Green Label Plus" program.
 - b. For installation adhesive, documentation including printed statement of VOC content.
- C. 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. Carpet tile type, color, and dye lot.
 - 3. Type of subfloor.
 - 4. Type of installation.
 - 5. Pattern of installation.
 - 6. Pattern type, location, and direction.
 - 7. Pile direction.
 - 8. Type, color, and location of insets and borders.
 - 9. Type, color, and location of edge, transition, and other accessory strips.
 - 10. Transition details to other flooring materials.

- D. 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-** long Samples.

- E. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

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

1.6 CLOSEOUT SUBMITTALS

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

1.7 MAINTENANCE MATERIAL SUBMITTALS

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

1.8 QUALITY ASSURANCE

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

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104.

1.10 FIELD CONDITIONS

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

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

1.11 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Products: Subject to compliance with requirements, provide the following:
 - 1. Shaw Commercial.
- B. Carpet types as scheduled on Interior Design Drawings
- C. Applied Soil-Resistance Treatment: Manufacturer's standard material.
- D. Antimicrobial Treatment: Manufacturer's standard material.
 - 1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm.
 - 2. Dry Breaking Strength: Not less than **100 lbf** according to ASTM D 2646.
 - 3. Tuft Bind: Not less than **5 lbf** according to ASTM D 1335.
 - 4. Delamination: Not less than **4 lbf/in.** according to ASTM D 3936.
 - 5. Dimensional Tolerance: Within **1/32 inch** of specified size dimensions, as determined by physical measurement.
 - 6. Dimensional Stability: 0.2 percent or less according to ISO 2551 (Aachen Test).
 - 7. Resistance to Insects: Comply with AATCC 24.
 - 8. Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 165.
 - 9. Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units) according to AATCC 16, Option E.
 - 10. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.
 - 11. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.
 - 12. Emissions: Provide carpet tile that complies with testing and product requirements of CRI's "Green Label Plus" program.

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.
 - 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. 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 finishes comply with requirements specified in Section 03 30 00 "Cast-in-Place Concrete" for slabs receiving carpet tile.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. For wood subfloors, verify the following:
 - 1. Underlayment over subfloor complies with requirements specified in Section 06 10 00 "Rough Carpentry."
 - 2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
- D. 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 **1/8 inch** wide or wider and protrusions more than **1/32 inch** unless more stringent requirements are required by manufacturer's written instructions.

- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet tile manufacturer.
- C. Maintain dye lot integrity. Do not mix dye lots in same area.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- G. Install pattern parallel to walls and borders.
- 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, "Protecting Indoor Installations."
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 09 68 13

SECTION 09 68 16 – SHEET CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. Tufted – Residential carpet Broadloom.
- B. Modular commercial type.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show the following:
 - 1. Carpet type, color, and dye lot.
 - 2. Seam locations.
 - 3. Pattern type, repeat size, location, direction, and starting point.
 - 4. Pile direction.
 - 5. Edge, transition, and other accessory strips.
 - 6. Transition details to other flooring materials.
- C. Samples: For each color and texture if required by the Architect.
- D. Product Schedule: For carpet Use same designations indicated on Drawings.
- E. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104, Section 5, "Storage and Handling."
 - 1. Store on a flat surface in a climate-controlled, dry space. Protect from soil, dust, moisture and other contaminants.
 - 2. Do not stack objects on top of carpet rolls. If stacking rolls is unavoidable, do not stack more than three rolls.
 - 3. Handle in a manner to avoid damage and distortion.
 - 4. Do not bend or fold carpet rolls. If this occurs, unroll and allow carpet to lie flat immediately upon arrival at the site of installation.

1.5 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."

1. Temperature and Humidity – Begin carpet installation when the indoor temperature is between 65-95°F (18-35°C) with a maximum relative humidity of 65%.
2. If ambient temperatures are outside these parameters, do not begin installation until the HVAC system is operational and these conditions are maintained at least 48 hours before, during and 72 hours after completion.
3. Ventilation - During installation, maintain fresh air ventilation using. Always exhaust air to the outside and avoid re-circulation. After installation, maintain fresh air ventilation for
4. 48-72 hours at normal room temperatures.

1.6 WARRANTY- SHEET CARPETING

- A. Special Warranty for Carpet: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, excess static discharge, and delamination.
 1. Warranty Period:
 - 10 Year Abrasive Wear Warranty
 - 10 Year Fade Resistance Warranty
 - 10 Year Texture Retention Warranty
 - 15 Year Soil Resistance Warranty
 - 20 Year Anti-static Warranty
 - 20 Year Manufacturing Defects Warranty
 - 20 Year Stain Resistance Warranty (Poly Or Olefin)
 - 7 Year Fade Resistance Warranty
 - 7 Year Texture Retention Warranty

1.7 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: Not less than 10 sq. yds. (8.3 sq. m) of each type, color, or pattern installed.

PART 2 - PRODUCTS

2.1 TUFTED CARPET

- A. Products: In apartment units, carpet to be Shaw “Fast Track Plus PS532”.
- B. For other areas, provide product and colors as indicated on Interior Design drawings.
- C. Width: 12 feet (3.7 m).
- D. Applied Soil-Resistance Treatment: Manufacturer's standard material.
- E. Antimicrobial Treatment: Manufacturer's standard material.
- F. Electrostatic Propensity: Less than 3.5 kV per AATCC 134.

2.2 MODULAR TILE

- A. Products: Provide product and colors as indicated on Interior Design drawings.

2.3 SOUND CONTROL UNDERLAYMENT

- A. Sound Control Underlayment see section 09 61 80 Acoustical Barriers.

2.4 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer. Adhesives to comply with LEED Credit EQ 4.1.
- C. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.
- D. Cushion: 7/16" inch rebond, 4 lb. density. Pad shall meet or exceed requirements of FHA Bulletin UM-44C.
- E. Metal Edge and Binding strips: Extruded aluminum alloy 6063-TSS, with steel tooth insert, natural finish, equal to William L. Bonnell Co. "Trimedge".
- F. Tackless strip for carpet over separate cushion: Water-resistant plywood strips with 3 rows of rust-resistant, evenly-spaced, angular pins of proper length to penetrate carpet backing, but not be seen from surface or be a safety hazard, of thickness to fit pad. Provide product equal to Roberts "Smoothedges Tackless Carpet Gripper Type II or III."

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 performance. Examine carpet for type, color, pattern, and potential defects.
- B. Testing Concrete Subfloors:
 - 1. Test all concrete floors for moisture emission rates using an anhydrous calcium chloride moisture test kit. Conducted carefully in strict compliance with ASTM Test Method F 1869.
 - 2. Moisture emission rate is measured in pounds of moisture over a 1000 sq. ft. area during a 24-hour period. Calcium chloride testing requires a minimum of 60 hours to conduct, proper installation planning is required.
 - 3. An emission rate of 3.0 lbs. (1.4 kg) or less is acceptable unless otherwise specified by the carpet manufacturer.

4. Alkalinity Testing:
 - a. Building to be at the same temperature and humidity expected during normal use. These conditions must be maintained 48 hrs prior to, and during testing.
 - b. A pH range of 7-9 is satisfactory; a reading above 9 requires corrective measures.
 - c. Perform testing in accordance with ASTM Standard Practice F-710; or consult the adhesive manufacturer for recommended testing and corrective procedures.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with carpet manufacturer's written installation instructions for preparing substrates.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm), unless manufacturer requires more stringent requirements'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 manufacturer.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet.

3.3 INSTALLATION

- A. Comply with CRI 104 and carpet manufacturer's written installation instructions for the following:
 1. Stretch-in Installation: Comply with CRI 104, Section 12, "Stretch-in Installation."
 2. Stair Installation: Comply with CRI 104, Section 13, "Carpet on Stairs" for stretch-in installation
 3. Install carpet cushion using the minimum number of sections. Adhere to substrate on all edges and with 12" wide strips in field to prevent shifting. Butt seams tightly and tape. Position cushion so that seams do not align with carpet seams above.
- B. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.
- C. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- D. Install pattern parallel to walls and borders.

END OF SECTION 09 68 13

SECTION 09 72 00 - WALL COVERINGS

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. Wallpaper.
- B. Related Sections:
 - 1. Section 09 91 13 "Interior Painting" Section for priming wall surfaces.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include data on physical characteristics, durability, fade resistance, and flame-resistance characteristics.
- B. LEED Submittals:
 - 1. Product Data for Credit IEQ 4.1: For adhesives, documentation including printed statement of VOC content.
- C. Shop Drawings: Show location and extent of each wall-covering type. Indicate pattern placement, seams and termination points.
- D. Samples for Initial Selection: For each type of wall covering indicated.
- E. Samples for Verification: Full width by **36-inch**- long section of wall covering.
 - 1. Sample from same print run or dye lot to be used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of fabric.
- F. Product Schedule: For wall coverings. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for wall covering.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For wall coverings to include in maintenance manuals.

1.6 MATERIALS MAINTENANCE SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wall-Covering Materials: For each type, full-size units equal to 5 percent of amount installed.

1.7 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Surface-Burning Characteristics: As follows, per ASTM E 84:
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 50 or less.
 2. Fire-Growth Contribution: Textile wall coverings complying with acceptance criteria of UBC Standard 8-2.
 3. Fire-Growth Contribution: Textile wall coverings tested according to NFPA 265 and complying with test protocol and criteria in the 2003 IBC.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Lighting: Do not install wall covering until a permanent level of lighting is provided on the surfaces to receive wall covering.
- C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.

PART 2 - PRODUCTS

2.1 WALL COVERINGS

- A. General: Provide rolls of each type of wall covering from same print run or dye lot.

2.2 WALLPAPER

- A. Colors, Textures, and Patterns: Match Interior Designer's samples.
 1. Refer to Finish Schedule as shown on Interior Design drawings.

2.3 ACCESSORIES

- A. Adhesive: Mildew-resistant, nonstaining, strippable adhesive, for use with specific wall covering and substrate application; as recommended in writing by wall-covering manufacturer.
 1. Adhesive shall have VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for levelness, wall plumbness, maximum moisture content, and other conditions affecting performance of the Work.

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

3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, mildew, and incompatible primers.
- C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
 - 1. Moisture Content: Maximum of 5 percent on new plaster, concrete, and concrete masonry units when tested with an electronic moisture meter.
 - 2. Gypsum Board: Prime with primer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
- D. Check painted surfaces for pigment bleeding. Sand gloss, semigloss, and eggshell finish with fine sandpaper.
- E. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.
- F. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.
- G. Install wall liner, with no gaps or overlaps, where required by wall-covering manufacturer. Form smooth wrinkle-free surface for finished installation. Do not begin wall-covering installation until wall liner has dried.

3.3 INSTALLATION

- A. General: Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated except where more stringent requirements apply.
- B. Cut wall-covering strips in roll number sequence. Change roll numbers at partition breaks and corners.
- C. Install strips in same order as cut from roll.
- D. Install reversing every other strip.
- E. Install wall covering with no gaps or overlaps, no lifted or curling edges, and no visible shrinkage.
- F. Match pattern **72 inches** above the finish floor.
- G. Install seams vertical and plumb at least **6 inches** from outside corners and **3 inches** from inside corners unless a change of pattern or color exists at corner. No horizontal seams are permitted.
- H. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.
- I. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without any overlay or spacing between strips.

3.4 CLEANING

- A. Remove excess adhesive at finished seams, perimeter edges, and adjacent surfaces.
- B. Use cleaning methods recommended in writing by wall-covering manufacturer.
- C. Replace strips that cannot be cleaned.
- D. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

END OF SECTION 09 72 00

SECTION 09 77 23 - FABRIC-WRAPPED PANELS

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 shop-fabricated, fabric-wrapped wall panels.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of fabric facing, panel edge, core material, and mounting indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Product Data for Credit IEQ 4.1: For installation adhesives, documentation including printed statement of VOC content.
- C. Shop Drawings: For fabric-wrapped wall panels. Include mounting devices and details; details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge and core materials.
 - 1. Include elevations showing panel sizes and direction of fabric weave and pattern matching.
- D. Samples for Initial Selection: For each type of fabric facing from fabric-wrapped, wall panel manufacturer's full range.
- E. Samples for Verification: For the following products, prepared on Samples of size indicated below:
 - 1. Fabric: Full-width by approximately **36-inch**- long Sample, but not smaller than required to show complete pattern repeat, from dye lot to be used for the Work, and with specified treatments applied. Mark top and face of fabric.
 - 2. Panel Edge: **12-inch**- long Sample(s) showing each edge profile, corner, and finish.
 - 3. Core Material: **12-inch**- square Sample at corner.
 - 4. Mounting Devices: Full-size Samples.
 - 5. Assembled Panels: Approximately **36 by 36 inches**, including joints and mounting methods.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Electrical outlets, switches, and thermostats.
 - 2. Items penetrating or covered by fabric-wrapped wall panels including the following:
 - a. Lighting fixtures.

- b. Air outlets and inlets.
 - c. Speakers.
 - d. Alarms.
 - e. Sprinklers.
 - f. Access panels.
3. Show operation of hinged and sliding components covered by or adjacent to fabric-wrapped wall panels.

B. Product Certificates: For each type of fabric-wrapped wall panel, from manufacturer.

C. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fabric-wrapped wall panels to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal recommendations.

1.6 MATERIALS MAINTENANCE SUBMITTALS

A. Furnish extra materials from same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fabric: For each fabric, color, and pattern installed, provide length equal to 10 percent of amount installed, but no fewer than **10 yards**.
2. Mounting Devices: Full-size units equal to 5 percent of amount installed, but no fewer than five devices, including unopened adhesives.

1.7 QUALITY ASSURANCE

A. Source Limitations: Obtain fabric-wrapped wall panels from single source from single manufacturer.

B. Fire-Test-Response Characteristics: Provide fabric-wrapped wall panels meeting the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Surface-Burning Characteristics: As determined by testing per ASTM E 84.
2. Fire Growth Contribution: Meeting acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265.

C. Pre-installation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with fabric and fabric-wrapped, wall panel manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.

B. Deliver materials and panels in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not install fabric-wrapped wall panels until spaces are enclosed and weather-tight, wet work in spaces is complete and dry, work at and above ceilings is

complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

- B. Lighting: Do not install fabric-wrapped wall panels until a permanent level of lighting is provided on surfaces to receive fabric-wrapped wall panels.
- C. Air-Quality Limitations: Protect fabric-wrapped wall panels from exposure to airborne odors such as tobacco smoke, and install panels under conditions free from odor contamination of ambient air.
- D. Field Measurements: Verify locations of fabric-wrapped wall panels and actual dimensions of openings and penetrations by field measurements before fabrication.

1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fabric-wrapped wall panels that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Fabric sagging, distorting, or releasing from panel edge.
 - b. Warping of core.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FABRIC-WRAPPED WALL PANELS

- A. For Panel type, manufacturer, style, fabric selection, and additional attributes refer to Finish Schedule as shown on Interior Design drawings.
- B. Fabric-Wrapped Wall Panel: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.
 - 1. Mounting: Back mounted with manufacturer's standard adhesive, secured to substrate.
 - 2. Core: Manufacturer's standard.
 - a. Core-Face Layer: Manufacturer's standard impact-resistant, acoustically transparent, copolymer sheet.
 - 3. Core Overlay: Polyester batting manufacturer's standard thickness.
 - 4. Edge Construction: Manufacturer's standard.
 - 5. Edge Profile: Custom profile as indicated on Drawings.
 - 6. Corner Detail in Elevation: Custom as indicated on Drawings with continuous edge profile indicated.
 - 7. Reveals between Panels: reveals as indicated on Drawings.
 - 8. Facing Material: As indicated on Drawings.
 - 9. Nominal Overall Panel Thickness: As indicated on Drawings.
 - 10. Panel Width: As indicated on Drawings.
 - 11. Panel Height: As indicated on Drawings.

2.2 MATERIALS

- A. General:
- B. Core Materials: Manufacturer's standard.

1. Adhesives: As recommended by fabric-wrapped, wall panel manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.3 FABRICATION

- A. General: Use manufacturer's standard construction except as otherwise indicated; with facing material applied to face, edges, and back border of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fabric, fabricated panels, substrates, areas, and conditions, for compliance with requirements, installation tolerances, and other conditions affecting performance of fabric-wrapped wall panels.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install fabric-wrapped wall panels in locations indicated with vertical surfaces and edges plumb, top edges level and in alignment with other panels, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.
- B. Comply with fabric-wrapped, wall panel manufacturer's written instructions for installation of panels using type of mounting devices indicated. Mount panels securely to supporting substrate.
- C. Align and level fabric pattern and grain among adjacent panels.

3.3 INSTALLATION TOLERANCES

- A. Variation from Plumb and Level: Plus or minus **1/16 inch**.

3.4 CLEANING

- A. Clip loose threads; remove pills and extraneous materials.
- B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION 09 77 23

SECTION 09 91 13 - EXTERIOR PAINTING

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 surface preparation and the application of paint systems on exterior substrates.
- B. Related Requirements:
 - 1. Section 05 12 00 "Structural Steel Framing" for shop priming of metal substrates with primers specified in this Section.
 - 2. Section 09 91 23 "Interior Painting" for surface preparation and the application of paint systems on interior substrates.
 - 3. Section 09 93 00 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on exterior wood substrates.
 - 4. Section 09 96 53 "Elastomeric Coatings" for surface preparation and application of elastomeric coatings on exterior Portland cement stucco substrates.

1.3 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Paint: 5 percent, but not less than **1 gal.** of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

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

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between **50 and 95 deg F.**
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than **5 deg F** above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

- A. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
- C. Colors: As indicated in a color schedule.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Wood: 15 percent.
 2. Portland Cement Plaster: 12 percent.
- C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.
 1. SSPC-SP 2, "Hand Tool Cleaning."
 2. SSPC-SP 3, "Power Tool Cleaning."
 3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
 4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

- F. Wood Substrates:
 - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- G. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 - 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 - 4. Paint entire exposed surface of window frames and sashes.
 - 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed to view:
 - a. Equipment, including panelboards and switch gear.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply

additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

- A. Steel Substrates:
 - 1. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Shop primer specified in Section 05 12 00 "Structural Steel Framing" where substrate is specified.
 - b. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5).
- B. Wood Substrates: Including wood trim.
 - 1. Latex System:
 - a. Prime Coat: Primer, latex for exterior wood.
 - b. Topcoat: Latex, exterior semi-gloss (Gloss Level 5).
- C. Plastic Trim Fabrication Substrates:
 - 1. Latex System:
 - a. Prime Coat: Primer, bonding, water based.
 - b. Topcoat: Latex, exterior semi-gloss (Gloss Level 5).

END OF SECTION 09 91 13

SECTION 09 91 23 - INTERIOR PAINTING

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 surface preparation and the application of paint systems on interior substrates.
- B. Related Requirements:
 - 1. Section 05 12 00 "Structural Steel Framing" for shop priming of metal substrates with primers specified in this Section.
 - 2. Section 09 91 13 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.
 - 3. Section 09 93 00 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on interior wood substrates.

1.3 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. LEED Submittals:
 - 1. Product Data for Credit EQ 4.2: For paints and coatings, including printed statement of VOC content.
- C. Samples for Initial Selection: For each type of topcoat product.
- D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, **8 inches** square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

- E. Product List: For each product indicated, include the following:
1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 2. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Paint: 5 percent, but not less than **1 gal.** of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

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

1.7 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Sherwin-Williams Company (The).
 2. Benjamin Moore
- B. See Finish Schedule on Drawing Sheet ID 0.10 for paint type manufacturers, color and finish.

2.2 PAINT, GENERAL

- A. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Dry-Fog Coatings: 400 g/L.
4. Primers, Sealers, and Undercoaters: 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Floor Coatings: 100 g/L.
9. Shellacs, Clear: 730 g/L.
10. Shellacs, Pigmented: 550 g/L.

C. Colors: As indicated in a color schedule.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 2. Testing agency will perform tests for compliance with product requirements.
 3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
 2. Masonry (Clay and CMU): 12 percent.
 3. Wood: 15 percent.
 4. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
- F. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in equipment rooms:

- a. Equipment, including panelboards.
2. Paint the following work where exposed in occupied spaces:
 - a. Other items as directed by Architect.
3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Non-traffic Surfaces:
 1. Latex System:
 - a. Prime Coat: Primer sealer, latex, interior.
 - b. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5).
- B. CMU Substrates:
 1. Institutional Low-Odor/VOC Latex System:
 - a. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5).
- C. Wood Substrates, Traffic Surfaces:
 1. Latex Floor Paint System:
 - a. Prime Coat: Primer sealer, alkyd, interior.
 - b. Intermediate Coat: Floor paint, latex, low gloss (maximum Gloss Level 3).
 - c. Topcoat: Floor paint, latex, low gloss (maximum Gloss Level 3).
- D. Gypsum Board Substrates:
 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC.
 - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5).

Crescent Resources, LLC
Circle at Ninth Street Apartments
Project No. 010110

END OF SECTION 09 91 23

SECTION 09 93 00 - STAINING AND TRANSPARENT FINISHING

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 surface preparation and application of wood finishes on the following substrates:
 - 1. Interior Substrates:
 - a. Dressed lumber (finish carpentry).
 - b. Exposed wood panel products.
- B. Related Requirements:
 - 1. Section 09 91 13 "Exterior Painting" for standard paint systems on exterior substrates.
 - 2. Section 09 91 23 "Interior Painting" for stains and transparent finishes on concrete floors.

1.3 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- D. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- E. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include preparation requirements and application instructions.
- B. LEED Submittals:
 - 1. Product Data for Credit EQ 4.2: For interior stains and coatings, documentation including printed statement of VOC content.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of finish system and in each color and gloss of finish indicated.
 - 1. Submit Samples on representative samples of actual wood substrates, **8 inches** square or **8 inches** long.
 - 2. Label each Sample for location and application area.
- E. Product List: For each product indicated, include the following:

1. Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the product proposed for use highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Stains and Transparent Finishes: 5 percent, but not less than **1 gal.** of each material and color applied.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each finish system indicated and each color selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Architect will select one surface to represent surfaces and conditions for application of each type of finish system and substrate.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least **100 sq. ft.**
 - b. Other Items: Architect will designate items or areas required.
 2. Final approval of stain color selections will be based on mockups.
 - a. If preliminary stain color selections are not approved, apply additional mockups of additional stain colors selected by Architect at no added cost to Owner.

1.7 DELIVERY, STORAGE, AND HANDLING

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

1.8 FIELD CONDITIONS

- A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between **50 and 95 deg F.**
- B. Do not apply finishes when relative humidity exceeds 85 percent; at temperatures less than **5 deg F** above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior finishes in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. Sherwin-Williams Company (The).

2.2 MATERIALS, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

- B. Material Compatibility:
 - 1. Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.

- C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction[and, for interior stains and finishes applied at project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].
 - 1. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
 - 2. Shellacs, Clear: VOC not more than 730 g/L.
 - 3. Stains: VOC not more than 250 g/L.
 - 4. Primers, Sealers, and Undercoaters: 200 g/L.

- D. Stain Colors: As indicated in a color schedule.

2.3 WOOD FILLERS

- A. Wood Filler Paste: MPI #91.

2.4 PRIMERS AND SEALERS

- A. Alkyd, Sanding Sealer, Clear: MPI #102.
- B. Shellac: MPI #88.

2.5 STAINS

- A. Stain, Semi-Transparent, for Interior Wood: MPI #90.

2.6 WATER-BASED VARNISHES

- A. Varnish, Water Based, Clear, Semi-Gloss (Gloss Level 5): MPI #129.
- B. Varnish, Water Based, Clear, Gloss (Gloss Level 6): MPI #130.

2.7 SOURCE QUALITY CONTROL

- A. Testing of Materials: Owner reserves the right to invoke the following procedure:
 - 1. Owner will engage the services of a qualified testing agency to sample wood finishing materials. Contractor will be notified in advance and may be present when samples are taken. If materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying wood finishes if test results show materials being used do not comply with product requirements. Contractor shall remove non-complying materials from Project site, pay for testing, and refinish surfaces finished with rejected materials. Contractor will be required to remove rejected materials from previously finished surfaces before refinishing with complying materials if the two finishes are incompatible or produce results that, in the opinion of the Architect, are aesthetically unacceptable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Exterior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- C. Maximum Moisture Content of Interior Wood Substrates: per manufacturer's instructions, measured with an electronic moisture meter.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with finish application only after unsatisfactory conditions have been corrected.
 - 1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 - 1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
 - 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.
- D. Interior Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.
 - 3. Sand surfaces that will be exposed to view and dust off.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for finish and substrate indicated.
 - 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.

3. Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 INTERIOR WOOD-FINISH-SYSTEM SCHEDULE

- A. Wood substrates, non-traffic surfaces, including wood trim, architectural woodwork, and wood-based panel products.
 1. Semitransparent Stain System:
 - a. Prime Coat: Stain, semi-transparent, matching topcoat.
 - b. Topcoat: Stain, semi-transparent, for interior wood, MPI #90.
 2. Water-Based Varnish over Stain System:
 - a. Stain Coat: Stain, semi-transparent, for interior wood, MPI #90.
 - b. First Intermediate Coat: Water-based varnish matching topcoat.
 - c. Second Intermediate Coat: Water-based varnish matching topcoat.
 - d. Topcoat: Varnish, water based, clear, semi-gloss (Gloss Level 5), MPI #129.
 3. Water-Based Varnish System:
 - a. Prime Coat: Water-based varnish matching topcoat.
 - b. Intermediate Coat: Water-based varnish matching topcoat.
 - c. Topcoat: Varnish, water based, clear, semi-gloss (Gloss Level 5), MPI #129.

END OF SECTION 09 93 00

SECTION 09 96 53 - ELASTOMERIC COATINGS

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 surface preparation and application of elastomeric coatings to exterior stucco substrates:
- B. Related Requirements:
 - 1. Section 09 24 00 "Portland Cement Stucco" for elastomeric coatings for exterior stucco walls.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of elastomeric coating indicated.
- C. Samples for Verification: For each type of elastomeric coating indicated and in each color and gloss.
 - 1. Submit Samples on same type of substrate as that to receive application, **8 inches** square.
 - 2. Step coats on Samples to show each separate coat, including primers and block fillers as applicable.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: For each product indicated, including the following:
 - 1. Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. Manufacturer's recommended spreading rate for each separate coat, including primers and block fillers for each type of substrate as applicable.
 - 3. Printout of current "MPI Approved Products List" for each product category specified in Part 2 that specifies coatings approved by MPI, with the proposed product highlighted.

1.4 MATERIALS MAINTENANCE SUBMITTALS

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

1.5 QUALITY ASSURANCE

- A. MPI Standards: Comply with MPI standards indicated and provide elastomeric coatings listed in the "MPI Approved Products List."

1. Preparation and Workmanship: Comply with requirements in the "MPI Architectural Painting Specification Manual" for products and coating systems indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

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

1.7 PROJECT CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between **50 and 90 deg F** unless otherwise permitted by manufacturer's written instructions.
- B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than **5 deg F** above the dew point; or to damp or wet surfaces.
- C. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before starting or continuing coating operation.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace elastomeric coatings that fail within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Water penetration through the coating.
 - b. Deterioration of coating beyond normal weathering.
 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Material Compatibility:
 1. Provide elastomeric finish coatings and crack fillers, primers, and block fillers as applicable for use within elastomeric finish coatings that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each material or coat, provide products and spreading rates recommended in writing by elastomeric coating manufacturer for use on substrate indicated.

2.2 OTHER MATERIALS

- A. Crack Fillers: Elastomeric coating manufacturer's recommended, factory-formulated crack fillers or sealants, including crack filler primers, compatible with substrate and other materials indicated; VOC content complying with limits of authorities having jurisdiction.
- B. Primer: Elastomeric coating manufacturer's recommended, factory-formulated, alkali-resistant primer compatible with substrate and other materials indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with manufacturer's requirements for maximum moisture content, alkalinity, and other conditions affecting performance of work.
- B. Begin coating only when moisture content of substrate is 12 percent or less when measured with an electronic moisture meter.
- C. Begin coating no sooner than 28 days after substrate is constructed and is visually dry on both sides.
- D. Verify that substrate is within the range of alkalinity recommended by manufacturer.
- E. Verify suitability of substrates including surface conditions and compatibility with existing finishes and primers.
- F. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in the "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.
- B. Remove hardware and hardware accessories, plates, machined surfaces, light fixtures, and similar items already installed that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
 - 1. After completing coating operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.
 - 2. Perform cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.
- D. Crack Repair: Fill cracks according to manufacturer's written instructions before coating surfaces.

3.3 APPLICATION

- A. Apply elastomeric coatings according to manufacturer's written instructions.
 - 1. Use equipment and techniques best suited for substrate and type of material being applied.
 - 2. Coat surfaces behind movable items the same as similar exposed surfaces.
 - 3. Apply each coat separately according to manufacturer's written instructions.
- B. Primers: Apply at a rate to ensure complete coverage.
- C. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats similar to color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

- D. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform finish, color, and appearance.
- E. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- F. Apply coatings to prepared surfaces as soon as practicable after preparation and before subsequent surface soiling or deterioration.
- G. Spray Application: Use spray equipment for application only when permitted by authorities having jurisdiction. Wherever spray application is used, do not double back with spray equipment to build up film thickness of two coats in one pass.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following testing procedures:
 - 1. Owner will engage the services of a qualified testing agency to sample materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance of materials with product requirements.
 - 3. Owner may direct Contractor to stop coating application if test results show materials being used do not comply with requirements. Remove non-complying materials from Project site, pay for testing, and recoat surfaces that were coated with rejected materials. Remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.
- B. Field Testing and Inspection: Owner reserves the right to engage the services of a qualified testing agency to verify installed thickness of elastomeric coatings.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities, touch up and restore damaged or defaced coated surfaces.

3.6 COATING SCHEDULE

- A. Stucco Substrates:
 - 1. Primer: Stucco primer if required by manufacturer.
 - 2. Elastomeric Finish Coat(s): Manufacturer's recommended number of coats and total dry film thickness for condition of substrate.
 - 3. Finish-Coat Color: Match Architect's samples.

END OF SECTION 09 96 53