

DIVISION 09

FINISHES

SECTION 09111 NON-LOAD BEARING STEEL FRAMING

1.00 GENERAL

1.01 SCOPE

- A. This Section includes non-load-bearing steel framing members for the following applications:
 - 1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).
 - 2. Interior suspension systems (e.g., supports for ceilings, suspended soffits, etc.).
- B. Related Sections include the following:
 - 1. Division 5 Section "Cold-Formed Metal Framing" for exterior load-bearing wall studs.
 - 2. Division 9 Section "Gypsum Board" for gypsum board supported by non-load-bearing framing and sound attenuation blankets installed between studs.
 - 3. Division 9 Section "Gypsum Board Shaft-Wall Assemblies" for non-load-bearing metal shaft-wall framing, gypsum panels, and other components of shaft-wall assemblies.
 - 4. Division 13 Section "Radiation Protection" for metal studs in shielded walls.

1.02 SUBMITTALS

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

1.03 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate nonload-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.

2.00 PRODUCTS

2.01 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. 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.

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2.02 SUSPENSION SYSTEM COMPONENTS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch diameter wire, or double strand of 0.0475-inch diameter wire.
- B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch diameter.
- C. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch wide flanges.
 - 1. Depth: As indicated on drawing partition schedule.
- D. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.
 - 1. Minimum Base Metal Thickness: 0.0179 inch.
- E. Resilient Furring Channels: 1/2-inch deep members designed to reduce sound transmission.
 - 1. Configuration: Hat shaped.
- F. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation; 640-C Drywall Furring System.
 - c. USG Corporation; Drywall Suspension System.

2.03 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Steel Studs and Runners: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 0.0312 inch.
 - 2. Depth: As indicated on Partition schedule showing non-firerated and non-firerated partition types..
- B. Slip-Type Head Joints: Where indicated, provide 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.
- 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.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fire Trak Corp.; Fire Trak.
 - b. Metal-Lite, Inc.; The System.
- D. Cold-Rolled Channel Bridging: 0.0538-inch bare-steel thickness, with minimum 1/2-inch wide flanges.

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1. Depth: 1-1/2 inches .
 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch thick, galvanized steel.
- E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base Metal Thickness: 0.0179 inch.
 2. Depth: 7/8 inch.
- F. Resilient Furring Channels: 1/2-inch deep, steel sheet members designed to reduce sound transmission.
1. Configuration: Asymmetrical or hat shaped.
- G. Cold-Rolled Furring Channels: 0.0538-inch bare-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 bare steel thickness of 0.0312 inch.
 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch diameter wire, or double strand of 0.0475-inch diameter wire.
- H. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare-metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

2.04 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.

3.00 EXECUTION

3.01 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.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to

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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 610 mm (24 inches) OC.
 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.

3.03 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.
 1. 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.

3.04 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components in sizes and spacings indicated on Drawings, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.
- 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 Force by bracing, countersplaying, or other equally effective means.

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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 or rolled-in hanger tabs of composite steel floor deck.
6. 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.

3.05 INSTALLING FRAMED ASSEMBLIES

- A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- B. Install studs so flanges within framing system point in same direction.
 1. Space studs as follows:
 - a. Single-Layer Application: 400 mm (16 inches) OC, unless otherwise indicated.
 - b. Multilayer Application: 400 mm (16 inches) OC, unless otherwise indicated.
 - c. Tile backing panels: 400 mm (16 inches) OC, unless otherwise indicated.
- C. 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.
 3. 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.
 4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- D. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 3mm (1/8 inch) from the plane formed by faces of adjacent framing.

END OF SECTION 09111

SECTION 09200 P L A S T E R

1.00 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all materials, labor, equipment, plant, tools, required to complete
 - all plain cement plaster finish.
- B. See drawings for details and location of work required.

1.02 RELATED DOCUMENTS

- A. See Division 4 Section "Mortar" for description of Materials.

2.00 PRODUCT

Refer to Section 01020 Summary of Materials and Finishes.

3.00 EXECUTION

3.01 PLAIN CEMENT PLASTER FINISH

- A. Provide all walls indicated with three coats of cement plaster (scratch coat, brown coat and finish coat). Mix each coat in the proportion of one part Portland cement to three parts and by volume.
- B. Apply the scratch coat with sufficient material and pressure to ensure a good bond and then scratch to a rough surface. Provide a thickness of 10 mm (3/8") for the scratch coat. Dampen with water before applying brown coat.
- C. Apply brown coat one day after applying scratch coat with a thickness of 10 mm (3/8") and level to a flat even surface. When stiff enough, trowel with a wooden float and cross hatch or broom lightly and evenly to secure a good mechanical bond for the finish coat. Wet the surface and keep from drying out for at least three (3) days.
- D. Apply finish coat seven (7) days after the application of the brown coat. Provide thickness of 3 mm (1/8"). Keep the finish coat damp but not saturated for a period of seven days.

END OF SECTION 09200

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SECTION 09250 GYPSUM BOARD

1.00 GENERAL

1.01 SCOPE

- A. This Section includes the following:
 - 1. Interior gypsum board.
 - 2. Exterior glass mat gypsum wall sheathing and ceiling/soffit board.
 - 3. Glass mat tile backing panels.
 - 4. Sound attenuation blankets.

1.02 QUALITY ASSURANCE

- 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.

2.00 PRODUCTS

2.01 PANELS, GENERAL

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

2.02 GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
- B. Regular Type:
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.
- C. Type X:
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.
- D. Ceiling Type: Manufactured to have more sag resistance than regular-type gypsum board.

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1. Thickness: 1/2 inch.
 2. Long Edges: Tapered.
- E. Coated Glass Mat Tile Backer Board: With moisture- and mold-resistant core and acrylic coated on tile side.
1. Core: 1/2 inch, dense gypsum.
 2. Facings: glass mat.
 3. Long Edges: Tapered.
 4. Meets ASTM C 1178.
 5. Install as the substrate behind all tile and other locations as may be noted on the drawings. Note, paper-faced "green" board for this application is not be allowed.
- F. Exterior Glass Mat Gypsum Wall Sheathing Board and Ceiling/Soffit Board: ASTM C 1177/C 1177M. With water-resistant core encased in water repellant glass mat both sides.
1. Type X.
 2. Facings: Glass mat both sides (paperless).
 3. Thickness: 5/8 inch.
 4. Edges: Square.
- G. Interior Glass Mat Gypsum Wall Sheathing Board and Ceiling Board: ASTM C 36/C 36M and ASTM C 1177/C 1177M. With water-resistant core and surfaces encased in water repellant glass mat both sides.
1. Type X.
 3. Facings: Glass mat both sides (paperless).
 4. Thickness: 5/8 inch.
 5. Edges: Tapered.
 6. Install as the substrate behind all epoxy wall and ceiling coatings. Note: Substrate is coordinated with Basis of Design epoxy wall coating. Changes to either Basis of Design substrate or painting specification requires coordination by the General Contractor to meet design intent and approval by the Owner's Representative.

2.03 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.

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- b. Bullnose bead.
- c. V-shaped reveal; exposed long flange receives joint compound.
- d. LC-Bead: J-shaped; exposed long flange receives joint compound.
- e. L-Bead: L-shaped; exposed long flange receives joint compound.
- f. U-Bead: J-shaped; exposed short flange does not receive joint compound.
- g. Expansion (control) joint.

2.04 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Wallboard: Paper.
 - 2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 - 3. 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.

2.05 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.
- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
- D. Acoustical Sealant: As specified in Division 7 Section "Joint Sealants."
- E. Thermal Insulation: As specified in Division 7 Section "Building Insulation."
- F. Vapor Retarder: As specified in Division 7 Section "Building Insulation."
- G. Felts: 15 pound roofing felt.

3.00 EXECUTION

3.01 EXAMINATION

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

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

3.02 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.
- G. 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.

3.03 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Regular Type: As indicated on Drawings.
 - 2. Type X: Where required for fire-resistance-rated assembly.
 - 3. Special Type X: Where required for specific fire-resistance-rated assembly indicated.
 - 4. Ceiling Type: Ceiling surfaces.
 - 5. Glass Mat Tile Backer Board: On all restroom walls and at any other locations as indicated on Drawings.
 - 6. Interior Glass Mat Gypsum Wall Sheathing Board: At all laboratory walls and other locations scheduled to receive epoxy paint, including ceilings.
- 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.

3.04 APPLYING TILE BACKING PANELS

- A. Glass Mat Tile Backing Board: Install at showers, tubs, and where indicated. Install with 1/4- inch gap where panels abut other construction or penetrations.
- B. Areas Not Subject to Wetting: Install regular-type gypsum wallboard panels to produce a flat urface except at showers, tubs, and other locations indicated to receive glass mat tile backer board.
- C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.05 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Owner's Representative for visual effect.

3.06 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below 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.

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- 4. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
- E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.07 PROTECTION

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

3.08 IDENTIFICATION

- A. Walls and partitions required to have protected openings (fire walls, fire barriers, fire partitions, smoke barriers, smoke partitions) shall be permanently identified with signs or painted stenciling. Such identification shall be above any ceiling or other concealed spaces.
 - 1. Example wording: 2-HOUR FIRE BARRIER. PROTECT ALL OPENINGS.
 - 2. Spacing: In each room, or every 15' on rated walls longer than 20'.

END OF SECTION 09250

SECTION 09265 GYPSUM BOARD ASSEMBLIES

1.00 GENERAL

1.01 SCOPE

- A. This section includes:
1. Metal stud framing.
 2. Standard, rated ceiling and water resistant gypsum board.
 3. Abuse resistant gypsum board.
 4. Gypsum shaft wall board.
 5. Polycarbonate backed gypsum board.
 6. Acoustical sealants and sound insulation.
- B. Related Sections include:
1. Division 6 Section - Rough Carpentry, for wood blocking criteria.
 2. Division 7 Section - Firestopping and Firesafing.
 3. Division 9 Section - Gypsum Veneer Plaster, for joint treatment for veneer plaster.
 4. Division 9 Section - Tile Backer Board.
 5. Division 9 Section - Gypsum Sheathing.
 6. Division 9 Section - Paints and Coatings, for painting and finishing for primers applied to gypsum board surfaces.

1.02 DESIGN AND PERFORMANCE CRITERIA

- A. Acoustic Attenuation for Identified Interior Partitions: 30 to 60 STC, ASTM E90.
- B. Steel Partition and Soffit Framing: ASTM C645 and ASTM C754[; and comply with ICBO #4943 of Steel Stud Manufacturers Association].
- C. Shaft Wall:
1. Air Pressure Within Shaft: [] psf ([] Pa) with maximum mid-span deflection of [] inch.
 2. Fire Rating Requirements: [] hour, [UL] [] listed assembly No. []. [UL] [] listed assembly shown.
 3. Acoustic Attenuation: [] STC, ASTM E90.

1.03 INFORMATIONAL SUBMITTALS:

- A. Follow Section 01330. Seismic Control Calculations: Signed and sealed by Professional Engineer registered in the Republic of the Philippines.
- B. Shop Drawings: Show construction methods and materials intended for seismic restraint.

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- C. Certificates: Submit test certificate showing name of testing agency and test number as evidence of compliance to specified fire resistance and acoustical ratings.

1.04 REGULATORY REQUIREMENTS:

- A. Design and construct systems to comply with Section 01410 for seismic control requirements.
- B. National Building Code of the Philippines and National Fire Code of the Philippines for fire rated assemblies to be determined through Code review and include:
 - 1. Fire Rated Partitions: UL No. [].
 - 2. Fire Rated Ceiling [and Soffits]: UL No. [].
 - 3. Fire Rated Structural Column Framing: UL No. [].
 - 4. Fire Rated Structural Beam Framing: UL No. [].

1.05 STORAGE AND HANDLING

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

1.06 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install 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.
- C. Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.
- D. All work under this Section shall be properly coordinated with the work of other Sections. In no case shall work of other Sections which is to be concealed by the work of this Section be so concealed until it has been inspected.

2.00 PRODUCTS

2.01 MANUFACTURERS

- A. Shall comply with all quality assurance and performance standards in this Section.

2.02 FRAMING MATERIALS

- A. Studs and Track: ASTM C645; galvanized steel: Use minimum 0.0179 inch base metal thickness (25 ga.), except where heavier gauge is required by ASTM C754 for fire rating or height limitations; minimum 0.0296 inch base metal thickness (20 ga.) at partitions receiving abuse-resistant board, and minimum 0.0329 inch base metal thickness (20 ga.) at wall hung shelves and wall hung casework. Top track shall have [2-1/2 inch extended legs to allow for deflection of overhead construction.
- B. Shaft Wall System: USG C-H studs, with J runners.
- C. Furring and Accessories: ASTM C645, except use 12 gauge hanger wire.
- D. Fasteners: ASTM C1002.
- E. Cold-Rolled Channel Bridging: 2 mm bare-steel thickness, with minimum 13 mm wide flanges.
 - 1. Depth: As indicated on Drawings 38.1 mm.
 - 2. Clip Angle: Not less than 38 mm x 38 mm x 2mm thick, galvanized steel.

2.03 GYPSUM BOARD MATERIALS

- A. Standard Gypsum Board: ASTM C1396; 13 mm (1/2 inch) or 16 mm (5/8-inch) thick as may be specified on drawings.
- B. Fire Rated Gypsum Board: ASTM C1396; fire resistive and water resistant type, UL rated; 13 mm (1/2 inch) or 16 mm (5/8-inch), thickness as required for rating shown.
- C. Gypsum Ceiling Board: ASTM C1396, 13 mm (1/2 inch) thick.
- D. Abuse Resistant Gypsum Board: U.S. Gypsum "Fiberock Aqua-Tough Interior Panels", foil-backed ASTM C1278, 16 mm (5/8 inch) thick, mold resistant, water resistant, fire resistive type, UL rated.
- E. Tile Backer Board: Georgia-Pacific DensShield tile backer board, 13 mm (1/2 inch) or 16 mm (5/8-inch) Fireguard Type X tested in accordance with ASTM D3273, with a test score of 10.
- F. Foil Backed Gypsum Board: ASTM C1336; aluminum foil backing.
- G. Gypsum Shaft Wall Board: ASTM C1336; 50 mm (1 inch) thick.

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3.02 OTHER MATERIALS

- A. Fasteners: Gypsum board screws, self-drilling, self-tapping steel screws. For steel framing less than 0.033 inch thick (generally, drywall studs), and ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick (generally, cold-formed metal framing specified in Division 5).
- B. Support For Wall Mounted Work in Non-Laboratory Areas:
 - 1. Wood Blocking: Follow Section 06 10 00.
 - 2. Strapping: Minimum 10 inch wide x 16 20 gauge galvanized sheet steel, ASTM A1008 or A1011, length to span not less than 3 studs.
- C. Acoustical Insulation: 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. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
 - 1. Type 1: Glass fiber; un-faced friction fit type; thickness 2 inches.
 - 2. Type 2: Rigid glass fiber board with permanent biocide to prevent growth of fungus or bacteria; thickness 2 inches; Johns Manville, Permacote Linacoustic R-300.
- D. Acoustical Sealant: ASTM C919, approved for fire rated designs shown.
- E. Trim: Corner beads, control joints and perimeter trim; no exposed metal "J" mold" permitted, except where space does not permit, joint tape and compound. At Contractor's option one of the following:
 - 1. Galvanized steel or vinyl. For trim used on exposed corners or edges, use type with flanges that will be concealed with joint compound.
 - 2. "No-Coat" copolymer tapered plastic trim with paper face and joint tape backing as manufactured by Drywall Systems International.
- F. Partition End Closure: Fry Reglet Corporation, Model DMEC-4875, 4-7/8 inch drywall molding end closure; aluminum, extruded Alloy 6063-T5. Finish as selected by A/E.
- G. Radius Moldings: 1 1/2 inch radius moldings for inside and outside corners at wall-to-wall and wall-to-ceiling intersections. Provide factory mitered and welded transitions with 12 inch legs, where wall corners meet ceilings. Fry Reglet Architectural Metals, Model Numbers DRMC-IS-150 and DRMC-OS-150 or similar models by Gordon "Final Forms I".
- H. Reveals: MM Systems Dura-Trim Drywall Reveal Molding DRMT 12-12; 0.060 inch thick extruded aluminum; 1/2 inch wide; or similar model by Fry Reglet.
- I. Joint Materials: ASTM C475;
 - 1. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

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2. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound: USG Durabond G90.
 3. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound: USG Durabond G90.
 4. Fill Coat: For second coat, use setting-type, sandable topping compound: USG Sheetrock Brand Topping Joint Compound Ready-Mixed.
 5. Third Coat: Same as Fill Coat.
- J. Waterproof Sealant: One part silicone.

3.00 EXECUTION

3.01 EXAMINATION

- A. Make a thorough examination of all surfaces receiving the work of this section, and including welded hollow-metal frames and framing, and before starting the installation, notify the A/E, in writing, of any defects which would affect compliance with requirements and the satisfactory completion of the work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of the work shall imply acceptance of the surfaces and conditions to perform the work as specified.
- C. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- D. Verify dimensions taken at the job site affecting the work. Bring field dimensions which are at variance to the attention of the A/E. Obtain decision regarding corrective measures before the start of installation.
- E. Examine the Contract Drawings and Specifications in order to ensure the completeness of the work required under this section. Supplementary parts, necessary to complete the work, though not specifically indicated on drawings or specified herein, shall be provided.

3.02 METAL STUDS AND FURRING

- A. Follow ASTM C754. Maximum deflection; L/240 at 5 psf loading. Space studs and furring 16 inches OC unless shown otherwise. Studs shall be in one piece from bottom to top runner; nesting of studs is prohibited unless specifically approved, in writing by the A/E.
- B. Partition Heights: [To suspended ceilings] [To 6 inches above suspended ceilings]. [Full height to construction above.] unless otherwise shown install additional bracing for partitions extending above ceiling where required to meet spanning criteria.
- C. Deflection Relief: At partitions built to underside of concrete floor, metal floor or roof decks, attach runner to floor, deck (construction); do not attach studs or gypsum board to

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runner; allow 1/2 inch deflection space between studs/gypsum board and underside of construction.

- D. Door Opening Framing: Single studs at door frame jambs, except double studs for doors wider than 2 feet 8 inches.
- E. Where studs and/or furring are installed directly against exterior walls install asphalt felt strips between studs and wall surfaces.

3.03 CEILING FRAMING

- A. Install hangers at maximum 4 feet OC. Where obstructions prevent vertical hanging (maximum 1 in 6 out of plumb), provide supplementary framing. Do not hang from ducts, pipes or other non-structural elements.
- B. Do not hang from steel roof decks with rigid board insulation. Do not hang from steel decks unless there is at least 4 inches of concrete over deck. Provide supplemental framing. Hanging from electrified floor deck is not permitted under any circumstances.
- C. Reinforce openings in ceiling suspension system which interrupt main support members. Extend bracing minimum 24 inches past each end of opening.

3.04 SUPPORT OF WALL MOUNTED WORK

- A. Coordinate with other affected Sections. Do not allow subsequent work to be supported on gypsum board alone. Support for wall mounted work shall be rigid, firmly attached, and of sufficient dimension to receive fasteners used to mount the work.
- B. Use metal strapping to support all wall mounted work, including laboratory casework, shelf brackets, shelving, etc., and span not less than three studs.
- C. Use wood blocking for support of:
 - 1. Wall mounted book shelf brackets (of type without standards).
 - 2. Wall mounted work using fasteners not suitable for strapping.
 - 3. Other work where loads applied to partition would cause rotating pull-out as opposed to shear.

3.05 ACOUSTICAL ACCESSORIES

- A. Place acoustical insulation tightly within spaces, behind and around electrical and mechanical work.
- B. Install acoustical sealant at gypsum board perimeter; around mechanical and electrical penetrations; seal face layer at openings for items penetrating partition and elsewhere as indicated; and at control joints on both sides of partition.

3.06 BOARD INSTALLATION

- A. For standard gypsum board follow ASTM C840.
- 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. 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.
- D. Erect single layer standard gypsum board vertically [in most economical direction], with edges over firm bearing.
- E. Erect single layer fire rated gypsum board vertically with edges over firm bearing.
- F. At double layer applications, stagger joints between layers.
- G. Caulk around pipe penetrations in water resistant gypsum board with waterproof sealant.
- H. Locate and construct control joints where shown, or follow USG "Gypsum Construction Handbook", whichever is more stringent. In addition, locate control joints in furred gypsum board directly over control joints in masonry back-up walls. Locations not shown are subject to approval.
 - 1. For fire-rated assemblies, where no insulation occurs, provide two layers of fire-rated gypsum board strips anchored to one metal stud and backing control joint; where insulation occurs, fill void between the two metal studs framing the joint.
- I. Use longest practical length of trim. Corner beads at external corners; edge trim where gypsum board abuts dissimilar materials.
- J. Install radius and reveal molding in spaces shown.
- K. Using gypsum board strips, install bevel guards at ledges 2 inches or wider in elevator shafts. Screw attach guards to stud framing.
- L. Screws shall be driven in slightly below the surface of the board, care being taken not to crush the core of the board or the surfacing of the paper, with screws heads forming a slight depression below the surface of the wallboard. Space screws per common industry standard, but not more than 12 inches o.c. Wallboard adjacent to the point of fastening shall be held tightly against the framing members while driving screws. Dependence on screws to draw the wallboard against the framing members is not acceptable.

3.07 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. Internal corners shall be treated in the manner specified for joints, except that the reinforcing tape shall be folded lengthwise through the middle and fitted neatly into the corner.
- C. External corners shall be one-piece corner bead treated after application with a joint cement as specified for joints.
- D. Exposed panel edges shall be finished with LC bead and joint treatment material.
- E. Attach accessories with same attachments used for wallboard, unless otherwise recommended by the manufacturer. All metal accessories shall be mechanically fastened. The method of "crimping" is not allowed.

3.08 JOINT AND SCREW DEPRESSION TREATMENT

- A. Finish gypsum board by multiple step process recommended by gypsum board manufacturer or ASTM C840, whichever is more stringent, to produce finish surfaces to the following levels as defined in Gypsum Association publication GA-214, and for the locations noted:
 - 1. Level 1: Joints and interior angles shall have tape embedded in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable: Work concealed above ceilings, where fire ratings or acoustical requirements are shown.
 - 2. Level 3: Not used.
 - 3. Level 4: Joints and interior angles shall have tape embedded in joint compound and three separate coats of joint compound applied over joints, angles, fastener heads, and accessories. Joint compound shall be smooth and free of tool marks and ridges: Exposed surfaces receiving painted finish, and surfaces receiving wallcovering, if any.
 - 4. Level 5: Joints and interior angles shall have tape embedded in joint compound and three separate coats of joint compound applied over joints, angles, fastener heads, and accessories. Trowel a thin skim coat of joint compound, or a material manufactured especially for this purpose, to entire surface. Surface shall be smooth and free of tool marks and ridges. Room Schedule for surfaces to receive Level 5 Finish:
 - a. Room No. [] - [Name]
 - b. Room No. [] - [Name]

- B. Where ceiling recessed light fixtures are mounted along walls, finish gypsum board whenever it is visible through the fixture grid, as required for adjacent walls.
- C. Screw Depressions: All boards shall fit tightly against the supporting framework before concealing the screw depressions. The depressions shall be filled with a final coat of joint compound and allowed to dry. The coating shall be sanded so as to leave a smooth finish flush with the paper face of the wallboard.

3.09 FIELD INSTALLATION TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

3.10 ADJUSTING, CUTTING AND PATCHING

- A. Make all adjustments in partitions, furring, drywall, and all other work under this Section as needed to accommodate the work of other Section.
- B. Provide all cutting and patching of work of this Section.

3.11 PROTECTION

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

END OF SECTION 092116

SECTION 09300 TILE

1.00 GENERAL

1.01 SCOPE

- A. Furnish all materials, labor, equipment, plant, tools required to complete:
- all types of tile works.

1.02 SAMPLES

- A. Submit samples of floor and wall tiles including all required beads and mouldings.
1. Interior Ceramic Floor Tile: TCA Method F115 over concrete substrate using dry-set mortar or latex-portland cement mortar and epoxy grout.
 2. Interior Ceramic Floor Tile: TCA Method F122 over waterproofed substrate using latex-portland cement mortar and latex-portland cement grout.
 3. Interior Ceramic Wall Tile: TCA Method W244 over cement backer board using dry-set mortar or latex-portland cement mortar and latex-portland cement grout.
 4. Exterior Ceramic and Quarry Floor Tile: TCA Method F132 over waterproofed substrate using epoxy mortar and epoxy grout.
- B. Shop Drawings: Show tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, threshold setting details.
- C. Product Data: All materials specified in this Section.
- D. Sample Boards after unit tile approvals: Mount tile and grout on 760 mm square plywood panels, representative of pattern, color variations and grout joint size variations.

1.03 QUALITY ASSURANCE: Comply with:

- A. TCA "Handbook for Ceramic Tile Installation".
- B. ANSI A137.1, Recommended Standard Specifications for Ceramic Tile.

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1.04 CERTIFICATION AND REGULATORY REQUIREMENTS: Comply with:

- A. US Food and Drug Administration requirements for materials in food service areas.

1.05 MOCK-UP: Follow Section 01450.

- A. Construct mock-up 1200mm x 1200 mm (4 feet) square for every type of tile.
B. Approved mock-up(s) may remain part of the work.

1.06 DELIVERY, STORAGE AND HANDLING: Follow Section 01600.

- A. Deliver materials in original unopened containers with manufacturer's name, brand name, grade, TCA seal of quality, color, pattern and other pertinent information clearly marked thereon.
B. Keep mortars and grouts in sealed, moisture-proof containers.
C. Protect products from overheating.

1.07 MAINTENANCE MATERIALS: Follow Section 01770.

- A. Provide additional 3000mm square of each type and color of tile for any repairs required during punchlist and prior to Final Acceptance.

2.00 PRODUCTS

Refer to Section 01020 Summary of Materials and Finishes.

2.01 GROUT AND TILE COLORS AND FINISHES

- A. Manufacturer's standards as selected.

2.02 CERAMIC WALL AND FLOOR TILE

- A. Manufacturers: Substitutions are permitted.
1. American Olean Tile.
2. Daltile.
3. Crossville Ceramics.
B. Refer to Finish Schedule for locations.

2.03 PORCELAIN TILE

- A. Manufacturers: Substitutions are permitted subject to Section 01 63 00
1. American Olean Tile Company "Terra Paver".
2. Buchtal Ceramics "Atlantis II".
3. Crossville Ceramics "Genesis".
4. Stone Source.

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- 5. Floorgres.
- B. Refer to Finish Legend on Drawings for selections.
- C. Trim Tile: Bullnose, cove base, and other special shapes as shown or required, composition and finish to match adjacent tile.

2.04 QUARRY (STONE) TILE

- A. Manufacturers: Substitutions are permitted.
 - 1. American Olean Tile Company.
 - 2. Daltile.
 - 3. Summitville Tiles Inc.
- D. Refer to Finish Schedule for locations.
- E. Trim Tile: Bullnose, cove base and other special shapes shown or required.

2.05 FILL AND LEVELING COATS

- A. Cementitious Fill Under Floor Tile: 3 parts sand to one part Portland cement.
- B. Portland Cement: ASTM C150, Type I.
- C. Sand: ASTM C144, clean and washed, 100 percent passing 16 mesh screen.
- D. Self Leveling Underlayment Under Floor Tile Where Indicated: Cementitious, rapid hardening compound; compressive strength at 28 days, at least 4300 psi.
- E. Lime: ASTM C207, Type S.
- F. Water: Clean and potable.

2.06 SETTING MATERIALS

- A. Dry-Set Mortar: ANSI A118.1.
- B. Latex-Portland Cement Mortar: ANSI A118.4.
- C. Flexible Latex Modified Portland Cement: ANSI A118.4; 25 percent minimum modulus of elongation.
 - 1. Bostik Hydroment; Flexalastic System.
 - 2. Laticrete International; Premium Thin-Set Latex Admix System.
 - 3. Mapei Corp.; Keralastic/Kerabond System.
 - 4. Substitutions are permitted.

2.07 GROUTS

- A. Standard Grout: Latex Portland cement, ANSI A118.6, integrated with silicone sealant.

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B. Epoxy Grout for exterior locations.

2.08 WATERPROOFING MEMBRANE

A. Manufacturers: Substitutions are permitted.

1. Laticrete International: Laticrete 9235 Waterproofing Membrane.
2. Mapei Corp: PRP M19 Mapelastic L.
3. Custom Building Products: Custom 9240 Waterproofing and Anti-Fracture Membrane.

F. ANSI/ASTM A118.10, Fabric-Reinforced, Fluid-Applied system consisting of liquid-latex rubber with a VOC content of 65g/L or less when calculated according to 40^oCFR^o59, Subpart D (EPA Method 24), and fabric reinforcement.

2.09 ACCESSORIES

A. Divider and Edge Strips: Schluter Systems, stainless steel, size to accommodate tile thickness.

B. Expansion and Control Joints: Schluter Systems, PVC, standard color(s) as selected, size to accommodate tile thickness.

C. Welded Wire Mesh: ASTM A185, 2 x 2 inch x 16/16 gauge , galvanized.

D. Thresholds: Domestic marble, white or gray color, honed finish, full width of wall or frame opening, beveled exposed edges, complying with ASTM C 503, with little or no veining, "Group A" as classified by the Marble Institute of America, having an abrasive hardness of 11 per ASTM C 241, and a maximum 48 hour absorption of .145% by weight, with sand rubbed finish unless finish otherwise selected by the Architect. Color, texture and pattern of marble as selected by the Architect and conforming to profiles and sizes noted on the drawings.

E. Cleaning Solution: Type which will not damage or discolor tile, joint materials, or accessories.

F. Grout Release: As recommended by manufacturers to prevent staining of unglazed tile by grout.

G. Primer for Gypsum Wallboard: As recommended by manufacturer of setting materials.

3.00 EXECUTION

3.01 APPLICATION OF SCRATCH COAT

- A. Thoroughly dampen, but not saturate, surfaces of masonry or concrete walls before applying the scratch coat. Make surface areas appear slightly damp. Allow no free water on the surface.
- B. On masonry, first apply a thin coat with great pressure, then bring it out sufficiently to compensate for the major irregularities on the masonry surfaces to a thickness of not less than 6 mm (1/4") at any point.
- C. Evenly rake scratch coats, but not dash coats, to provide good mechanical key for subsequent coats before the mortar has fully hardened.
- D. On surfaces not sufficiently rough to provide good mechanical key, dash on the first coat with a whisk broom or fiber brush using a strong whipping motion. Do not trowel or otherwise disturb mortar applied by dashing until it is hardened.

3.02 FLOOR TILE INSTALLATION ON MORTAR BED

- A. Before spreading the setting bed, establish lines of borders and center the fieldwork in both directions to permit the pattern to be laid with a minimum of cut tiles.
- B. Clean concrete sub-floor then moisten but not soak. Afterwards, sprinkle dry cement over the surfaces and spread the mortar on the setting bed.
- C. Mix mortar one (1) part Portland cement to three (3) parts sand. Tamp to ensure good bond over the entire area and screed to provide a smooth level bed at proper height and slope.
- D. Pitch floor to drains as required.
- E. After setting bed has set sufficiently to be worked over, sprinkle dry cement over and lay tiles.
- F. Keep tile joints parallel and straight over the entire area by using straight edges.
- G. Tamp the tile solidly into the bed, using wood blocks of size to ensure solid bedding free from depression.
- H. Lay tiles from center lines outward and make adjustments at walls.

3.03 (NOT USED) WALL TILE INSTALLATION ON MORTAR BED

- ~~A. Before application of mortar bed, dampen the surface of the scratch coat evenly to obtain uniform section.~~
- ~~B. Use temporary or spot grounds to control the thickness of the mortar bed. Fill out the mortar bed even with the grounds and rod it to a true plane.~~
- ~~C. Apply the mortar bed over an area no greater than can be covered with tile while the coat is still plastic.~~
- ~~D. Allow no single application of mortar to be 19 mm (3/4") thick.~~
- ~~E. Completely immerse wall tile in clean water and soak it at least 1/2 hour. After removal, stack tile on edge long enough to drain off excess water. Re-soak and drain individual tiles that dry along edges. Allow no free moisture to remain on the back of tile during setting.~~

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- ~~F. Apply a bond coat 1/32 to 1/16 inch thick to the plastic setting bed or to the back of each sheet or tile.~~
- ~~G. Press tile firmly into the bed and beat into place within one (1) hour.~~
- ~~H. Lay tile fields in rectangular block areas not exceeding 600 mm by 600 mm (24" by 24"). Cut the setting bed through its entire depth along the edges of each block area after placement and before subsequent blocks are installed.~~
- ~~I. Within 1 hour after installation of tile, remove strings from string set tile and wet the faces of face mounted tile and remove the paper and glue. Avoid using excess water. Adjust any tile that is out of alignment.~~

3.04 GROUTING

- A. After tile, brick, or marble slab has sufficiently set, force a maximum of grout into joints by trowel, brush or finger application.
- B. Before grout sets, strike or tool the joints of cushion-edge tiles to the depth of the cushion.
- C. Fill all joints of square-edged tile flush with the surface of the tile. Fill all gaps or sips.
- D. During grouting, clean all excess grout off with clean burlap, other clothes or sponges.

3.05 CLEANING

Sponge and wash tile thoroughly with clear water after the grout has stiffened. Then clean by rubbing with damp cloths or sponges and polish clean with dry cloth.

3.06 EXAMINATION PRIOR TO ALL TILE WORK

- A. Inspect substrates scheduled to receive tile. Do not proceed with installation until defects have been corrected.
- B. Verify that work of other Sections, which is to be set into tile, has been installed and approved.
- C. Verify that slabs receiving tile do not vary more than 1/8 inch in 10 feet where cementitious fill and self-leveling underlayment is not required.

3.07 INSTALLATION - GENERAL REQUIREMENTS

- A. Lay out work so that wherever possible, no less than half tiles are used. Do not split tiles. Do not interrupt tile pattern through openings. Align joints to give straight uniform grout lines, parallel with building lines.
- G. Make internal angles square and external corners bullnose. Provide cove bases unless otherwise shown or specified.
- H. Install edge strip to terminate or separate tile from other floor finishes. Edge strip not required at marble thresholds.
- I. Set tile firmly with surfaces in true plane. Make joint lines plumb and level. Where sizes permit, line up joints in wall, base and floor tile.

- J. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Fill joints solidly with grout. Make joints watertight, without voids, cracks, excess mortar [or adhesive], or excess grout.
- K. Cut and fit tile around tile penetrations and accessories. Grind cut edges without marring surfaces where edges will be exposed to view. Fit tile around penetrations, so that plates, collars, escutcheons or coverings, where used, will overlap tile edges. Drill tile at pipe stubs.
- L. At floor drains, dish tile slightly only at drain area, unless indicated otherwise.
- M. Sound tile after setting. Replace hollow sounding units. Replace cracked, broken, or imperfect tile.
- N. Allow tile to set for at least 48 hours before grouting.
- O. Remove grout haze and grout release. Use methods which will not damage or discolor tile or adjacent surfaces, or change its sheen. Polish surface of glazed tile with a soft cloth.
- P. Point voids that become apparent after cleaning. Use freshly mixed grout.

3.08 CONTROL AND EXPANSION JOINTS

- A. Control and expansion joint locations are shown on Drawings in accordance with TCA recommendations.
- Q. Build joints in accordance with TCA Details EJ171, using sealant and backer rod. Meet applicable requirements of Section 07920. Width of joint shall be equal to grout joint, but not less than 5mm. Use chemical resistant sealant in epoxy grout areas or use epoxy grout containing silicone sealant properties.
- C. Keep control and expansion joints free of adhesive and grout.

3.09 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANE INSTALLATION

- A. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
- R. Pre-treat cracks and joints; coves, corners and seams; drains; and penetrations with liquid membrane material and reinforcing fabric in strict accordance with the manufacturer's printed instructions.
- S. Install crack-suppression membrane to comply with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.

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- T. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

END OF SECTION 09300

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SECTION 09511 ACOUSTICAL PANEL CEILINGS

1.00 GENERAL

1.01 SCOPE

- A. Section includes
 - 1. Acoustic panel and tile ceilings.
 - 2. Pan ceiling system with acoustical insulation.
 - 3. Plank ceiling system with acoustical insulation.
 - 4. Cell ceiling system.
 - 5. Ceiling suspension systems.
 - 6. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete at ceilings.
- B. Related Sections
 - 1. Division 16 Section - Lighting, for safety hangers and attachments for lighting fixtures.

1.02 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.

1.03 SUBMITTALS: Follow Section 01330.

- A. Shop Drawings 1:50 (1/4" = 1'-0") scale drawings):
 - 1. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved.
 - 2. Indicate starting point and dimensions and method of attaching hangers to building structure. Layout grid to avoid narrow strips along walls, lighting fixtures and air diffusers; minimum 1/2 full size units unless shown otherwise, or where walls are not parallel. Show trim, accessories and unusual details. Drawings shall have exterior and interior partitions shown. Building column grid lines shall also be shown.
 - 3. Coordinate with Divisions 22, 23 and 26. Show mechanical and electrical work recessed in or affixed to ceilings. Prior to A/E review, obtain written approval of sprinkler head locations and of other trades whose work penetrates ceilings.
 - 4. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.

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- B. Product Data: Submit manufacturer's latest published technical data for each type of acoustical ceiling unit and suspension system required Show test reports indicating conformance to specified criteria.
 - C. Samples: 300 mm (12 inch) square samples of each type of ceiling panel and 200 mm (8 inch) long samples of exposed wall molding and suspension system, including main runner and 1200 mm (4 foot) cross tees.
 - D. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC. Also submit certification from manufacturer of each type of ceiling suspension system anchorage and attachment device, indicating safe load capacity of each type of unit.
 - E. Informational Submittals:
 - 1. Shop Drawings: Show construction methods and materials intended for seismic restraint.
 - F. LEED Submittals: Follow Section 01 81 13.
 - 1. Credit MR 4.1[and 4.2]: List of proposed materials with recycled content.
 - a. Indicate cost, post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.
 - 2. Credit MR 5.1[and 5.2]: Product Data indicating location of regional material for regionally extracted, harvested, or recovered materials.
 - a. Include statement indicating cost and distance from manufacturer to Project for each regionally manufactured material.
 - b. Include statement indicating cost and distance from point of extraction, harvest, or recovery to Project for each raw material used in regionally manufactured materials.]

1.04 REGULATORY REQUIREMENTS

- A. Comply with Seismic Control requirements.
- B. Systems shall have the following performance characteristics with components identified with appropriate markings of applicable testing organization:
 - 1. Surface Burning Characteristics: the following surface burning characteristics when tested per ASTM E84 and complying with ASTM E1264 for Class A products: Maximum flame spread 25; maximum smoke developed 50.

1.05 MOCK-UPS:

- A. Provide a mock-up at least 3000 mm x 3000 mm (10 x 10 feet) of each system. Include all components of system.
- B. Approved mock-up(s) may remain part of the work.

1.06 DELIVERY, STORAGE AND HANDLING

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

1.07 PROJECT CONDITIONS

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

1.08 MAINTENANCE MATERIALS: Follow Section 01 77 00.

- A. Provide extra acoustical units of each type used, in original wrapping, clearly labeled as to contents. Furnish acoustical units from same production run used for this Project. Minimum quantities of each material as follows (full carton lots):

| PROJECT AREA, PER TYPE OF MATERIAL | EXTRA MATERIALS |
|------------------------------------|-----------------|
| 5,000 square feet or less | 100 square feet |
| 5,000 to 15,000 square feet | 200 square feet |
| 15,001 to 50,000 square feet | 300 square feet |
| 50,001 to 100,000 square feet | 400 square feet |
| 100,000 to square feet or more | 500 square feet |

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2.00 PRODUCTS

- A. DESIGN STANDARD MANUFACTURER: The basis of design is the manufacturer listed for each type of ceiling system specified. Substitutions are permitted subject to review and approval by the Owner.

2.01 ACOUSTICAL CEILING TYPE ACT-1

- B. Acoustical Panels: OFFICES, CORRIDORS, DRY LABORATORIES Acceptable Product: Cortega Tile & Lay-In, 824 as manufactured by Armstrong World Industries.
1. Surface Texture: Medium.
 2. Composition: Mineral Fiber.
 3. Color: White.
 4. Size: 610 mm x 610 mm x 16 mm (24in x 24in x 5/8in).
 5. Edge Profile: Square Lay-In for interface with Prelude XL 15/16 inch Exposed Tee.
 6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, 0.55.
 7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 35.
 8. Articulation Class (AC): ASTM E 1111; Classified with UL label on product carton N/A.
 9. Flame Spread: ASTM E 1264; Class A (UL)
 10. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.82.
 11. Dimensional Stability: Standard.
- C. Suspension System: Acceptable Product: Prelude XL 24 mm (15/16) inch Exposed Tee as manufactured by Armstrong World Industries, Inc.
1. Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized as per ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished aluminum in baked polyester paint. Main beams and cross tees shall have rotary stitching.
 - a. Structural Classification: ASTM C 635 Intermediate Duty.
 - b. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
 2. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
 3. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three design load, but not less than 12 gauge.
 4. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations,

including light fixtures, that fit type of edge detail and suspension system indicated.
Provide moldings with exposed flange of the same width as exposed runner.

2.02 ACOUSTICAL CEILING TYPE ACT-2

- A. Acoustical Panels: WET LABORATORIES Basis of Design Product: Clean Room VL Nonperforated, 870 as manufactured by Armstrong World Industries. Substitutes are allowed subject to review and approval by the Owner.
1. Surface Texture: Smooth.
 2. Composition: Mineral Fiber with vinyl-faced membrane.
 3. Color: White.
 4. Size: 610 mm x 610 mm x 16 mm (24in x 24in x 5/8in).
 5. Edge Profile: Square Lay-In for interface with Prelude Plus XL Fire Guard 24 mm (15/16 inch) Exposed Tee.
 6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, N/A.
 7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 40.
 8. Articulation Class (AC): ASTM E 1111; Classified with UL label on product carton N/A.
 9. Flame Spread: ASTM E 1264; Fire Resistive.
 10. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.80.
 11. Dimensional Stability: HumiGuard Plus - temperatures up to 120 degrees F and high humidity excluding only exterior use, use over standing water, and direct contact with moisture.
 12. Mold/Mildew Inhibitor: The back only of the product has been treated with BioBlock, a paint that contains a special biocide that inhibits or retards the growth of mold or mildew, ASTM D 3273.
- B. Suspension System: Acceptable Product: 38 mm (1-1/2 inch) Co-Extruded Clean Room as manufactured by Armstrong World Industries, Inc. Substituted tiles shall be install with the manufacturer's compatible products.
1. Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel (aluminum or stainless steel) in baked polyester paint. Main beams and cross tees shall have rotary stitching (exception: extruded aluminum or stainless steel).
 - a. Structural Classification: ASTM C 635 Intermediate Duty.
 - b. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.

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2. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
3. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three design load, but not less than 12 gauge.
4. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.
5. Accessories: (CHDC) Clean Room Hold Down Clip with gaskets.

2.03 ACCESSORIES

- A. Acoustic Insulation: ASTM C665, Type I, friction fit type, unfaced; 2 inch thick, 0.75 pcf size cut to fit acoustic system. Provide batt insulation for all 24in x 24in panel ceilings, and roll or blanket insulation for larger size panel ceilings.
- B. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches OC on all cross tees.
- C. Clean-Room Gasket System: Where indicated, provide manufacturer's standard system, including manufacturer's standard antimicrobial gasket and related adhesives, tapes, seals, and retention clips, designed to seal out foreign material from and maintain positive pressure in clean room.

3.03 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Verify that moisture and dust generating activities are complete and overhead mechanical and electrical work is tested and approved.

3.02 INSTALLATION

- A. Seismic Restraint Installation: Follow ASTM E580, except that exclusion of 13 sm (144 square foot) ceilings is not applicable. All ceiling suspension systems in public areas shall require seismic restraint.

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- B. Lay out suspension system to accommodate work in place or to be installed above ceiling.
- C. Ceiling systems shall support all superimposed loads, with maximum deflection of $L/360$ of span.
- D. Space hangers maximum 1200 mm (4 feet) OC. Where obstructions prevent vertical hanging, (maximum 1 in 6 out of plumb), provide supplementary hangers and suspension system to frame around obstructions. Do not hang from ducts, pipe, conduit or other non-structural elements. Use of ceiling grid as supplemental steel to bridge obstructions is prohibited.
- E. In rooms that are under different atmospheric pressure (negative or positive) than surrounding areas, provide additional framing, struts or hangers to prevent deflection caused by sudden drops or rises in pressure when doors to these spaces are opened.
- F. Hanging from steel roof decks with rigid board insulation is not approved. Provide supplemental framing as required, as specified in Section 05500.
- G. Hanging from steel roof or floor decks is approved only when there is at least 100 mm (4 inches) of concrete over deck. For attachment of hanging and bracing wire to metal decks with concrete cover, follow Method (e), ASTM E580, Fig. 4.
- H. Provide stabilizer bars where lighting fixtures cause eccentric loading or twisting of suspension system members.
- I. Install perimeter trim at intersection of ceiling and vertical surfaces, using maximum lengths. Miter corners. Provide appropriate moldings at junctions with other ceiling finishes. At bullnose CMU, provide pre-formed closers to match perimeter molding.
- J. Form expansion joints shown. Form to accommodate plus or minus 50 mm (1 inch) movement and maintain visual closure.
- K. Intermingle ceiling material from several cartons to disperse variations over a large area.
- L. Cut and fit material as required. When making field fabricated rabbeted edges, apply latex paint to match finished surfaces where exposed to view.
- M. Run grain of ceiling units in one direction within each room and space. Grain direction for each room and space will be indicated by A/E on shop drawings.
- N. Provide fire protective materials at ceiling openings to meet requirements of applicable fire-rating system.
- O. Install hold down clips on lay-in panels within 6000 mm (20 feet) of an exterior door

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- P. Lay acoustic insulation for a distance of 1200 mm (48 inches) either side of acoustic partitions. Install insulation perpendicular to cross tees so that grid supports weight of insulation.
- Q. Lay sound absorbent pads directly in perforated panels. Fill voids to form complete sound absorbent cover.

3.03 CLEANING

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

END OF SECTION 09511

Read and accepted as part of the Contract:

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SECTION 09600 **S T O N E**

1.00 GENERAL

1.01 SCOPE

- A. Furnish all materials, labor, equipment, plant, tools required to complete:
 - all homogeneous granite stone slab finish
- B. See drawings and details for location.

1.02 RELATED DOCUMENTS

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

2.00 PRODUCTS

Refer to Section 01020 Summary of Finishes and Materials.

3.00 EXECUTION

3.01 EXAMINATION

- A. Examine surfaces to receive stone flooring finishes and conditions under which finish will be installed for compliance with requirements for installation tolerances and other conditions affecting performance of stone paving and flooring.

3.02 PREPARATION

- A. Vacuum clean concrete substrates to remove dirt, dust, debris, and loose particles.
- B. Remove substances from concrete substrates that could impair mortar bond, including curing and sealing compounds, form oil, and laitance.
- C. Clean stone surfaces that have become dirty or stained by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.03 INSTALLATION, GENERAL

- A. Execute stone paving and flooring installation by skilled mechanics and employ skilled stone fitters at the site to do necessary field cutting as stone is set.
- B. Set stone to comply with Drawings and Shop Drawings. Match for color and pattern by using units numbered in sequence as indicated on Shop Drawings.
- C. Scribe and field-cut stone as necessary to fit at obstructions. Produce tight and neat joints.
- D. Provide the necessary non-rust anchors to fix the stone slab finish permanently on walls.

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END OF SECTION 09600

Read and accepted as part of the Contract:

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SECTION 09605

VAPOR TRANSMISSION TESTING

1.00 GENERAL

1.01 SECTION INCLUDES

- A. Testing of concrete floor slabs to gain assurance that delamination of finish flooring materials will not occur due to detrimental amounts of water vapor transmission.

1.02 SUBMITTALS: Follow Section 01330.

- A. Floor Plan Diagram: Show the location of each test, and type of test proposed.
- B. Informational Submittals: Test results.

1.03 QUALITY ASSURANCE

- A. Testing methods may be mat tests, bond tests, electronic metering, chemical tests, or calcium chloride tests. Use method of testing as recommended by the flooring material manufacturer.
- B. Where Maximum Vapor Emission Rates (MVER) are stipulated by the manufacturer, but no testing method is prescribed, the method used shall be the calcium chloride test, following ASTM F1869 unless otherwise specified in another specification section. Under the calcium chloride test method, test results shall be expressed in pounds of water per 1,000 square feet transmitted from the concrete in 24 hours.
- C. For all testing procedures prescribed for use, follow flooring manufacturer's instructions regarding number of tests, building conditions (HVAC, Heat), and other stipulations.

2.00 PRODUCTS

2.01 GENERAL

- A. Use materials, kits, and measuring devices required to obtain results as recommended by the flooring manufacturer to judge the acceptability of the concrete.

3.00 EXECUTION

3.01 TESTING

- A. Perform tests, and record results on floor plan diagram. Submit as specified under Informational Submittals.

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- B. Test new concrete floor slabs, both on grade and those suspended above grade scheduled to receive finish flooring materials.
- C. If test results do not fall within acceptable range as required by the flooring manufacturer, advise the Construction Manager and the Owner, in writing, indicating results and proposed remedial method to achieve acceptance.

END OF SECTION 09605

Read and accepted as part of the Contract:

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SECTION 09610 CONCRETE FLOOR TREATMENT

1.00 GENERAL

1.01 SECTION INCLUDES

- A. Sealing of exposed concrete floors.

1.02 SUBMITTALS:

- A. Product Data: Describe sealer/hardener.

2.00 PRODUCTS

2.01 MANUFACTURERS: Substitutions are permitted.

- A. Edoco by Dayton Superior; Safe Cure & Seal 30 %.
- B. Euclid Chemical Company; Super Aqua-Cure VOX.
- C. L & M Construction Chemicals; Dress & Seal #30 WB.

2.02 MATERIALS

- A. Sealer/Hardener: Water-based; clear, non-yellowing, high solids acrylic system, minimum 30 percent solids content.

3.00 EXECUTION

3.01 INSTALLATION

- A. Immediately prior to substantial completion of the project, apply one coat of sealer/hardener to the following surfaces: Note: This application is in addition to compound curing specified in Division 3 Concrete.
 - 1. Interior concrete floors, including equipment housekeeping pads and stairs that will be exposed in the finished Work and will not receive finish flooring materials.
 - 2. Concrete slabs beneath wood flooring.

END OF SECTION 09610

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SECTION 09612

CONCRETE DENSIFIER AND SEALER – INTERIOR

1.00 GENERAL

1.01 SUMMARY

- A. Integral chemically reactive water-based densifier, sealer, and dustproofer for interior applications where shown on the Finish Schedules.
- B. All components and accessories required for a complete installation.

1.02 RELATED SECTIONS

- A. Section Series 03300— Cast In Place Concrete

1.03 REFERENCE STANDARDS

- A. ADA - Americans with Disabilities Act
 - 1. ADA Slip Fall Resistance Tests
- B. US Federal VOC Standards for the Concrete Construction Industry.
- C. EPA — Environmental Protection Agency.
 - 1. Modified EPA Test Method 300.
- D. USDA - United States Department of Agriculture.
- E. ASTM — American Society for Testing and Materials.
 - 1. ASTM C-642 (Absorption)
 - 2. ASTM C-666 (Concrete Durability Test)
 - 3. ASTM C-672 (Scaling Resistance)
 - 4. ASTM C.779 (Abrasion Resistance)
 - 5. ASTM E-274 (Skid Resistance)

1.04 SUBMITTALS:

- A. Submit in accordance with procedures specified in Section 01330
- B. Substitutions: Other products are acceptable if in compliance with all requirements of these specifications. And in accordance with Section 01630.
- C. Submit shop drawings detailing installation methods and construction indicating field verified conditions, clearances, and measurements.
- D. Product Data: Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations. Submit data in sufficient detail to

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indicate compliance with the contract documents. Submit the manufacturers instructions for installation.

- E. Samples: Submit samples of product applied over concrete.
- F. Unit Prices: Submit unit prices for material in square yards.
- G. Maintenance Instructions: Submit instructions for maintenance.
- H. Product Certification: Submit manufacturer's certification that products comply with requirements of the specifications. Submit test results indicating compliance with Reference Standards.

1.05 MOCK-UP:

- A. Apply a Job-site mock up under project conditions, with the same type of equipment; to ensure contractor qualifications, product performance and aesthetics on the job.
- B. The mock up shall be maintained for the duration of the Project as a measure of expected material, workmanship, and installation quality.

1.06 QUALITY ASSURANCE

- A. Comply with Section 01450, Quality Assurance.
- B. Manufacturer: Company specializing in Work of this Section with documented experience. Components shall be by one manufacturer. Manufacturer shall provide a list of installations of similar scope and level of quality.
- C. Installer: Companies specializing in Work of this Section with documented experience. The applicator/installer shall certify rate of application.
- D. Pre-Installation Conference: Conduct conference at project site. Review methods and procedures related to installation including, but not limited to, the following:
 - 1. Inspect and discuss conditions of concrete and other preparatory work performed under other contracts.
 - 2. In addition to the Contractor and the Installer, arrange for the attendance of Installers affected by the Work, The Owner's representative. and the Architect.
- E. The Contractor shall verify special conditions required for the installation of the system.
- F. The Contractor shall notify the Architect, Owner and Construction Manager of any discrepancies.
- G. Materials shall comply with all applicable standards Occupational Health and Safety Standards and Installers shall be provided with manufacturer recommended protective clothing, gloves and breathing apparatus.
- H. Provide as a complete system. Refer to schedules.
- I. Discoloration and odors at Substantial Completion or Beneficial Occupancy are unacceptable.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section 01600, Product Requirements.
- B. Prevent contact with materials that may cause dysfunction.
- C. Deliver and store components with labels intact and legible.
- D. Store materials/components in tight containers, in a safe place, dry, inside, under cover, In a well-ventilated area.
- E. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.
- F. Inspect all delivered materials and products to ensure they are undamaged and in good condition.
- G. Comply with manufacturer's recommendations.

1.08 WARRANTY

- A. Provide manufacturer's standard written warranty. Comply with Division 1 section on Warranties.
 - 1. Repair defects from faulty materials or workmanship developed during the guarantee period, or replace with new materials/components, at no expense to Owner.
 - 2. Length of warranty shall be scheduled or as selected by the Owner from Manufacturer's standard warranties.

2.00 PRODUCTS AND MATERIALS:

2.01 MATERIAL:

- A. Material: Premixed, soluble reactive silicate densifier composed of a blend of sodium, potassium, fluoru or other silicates, surfactants, polymers, and stabilizers to saturate and seal concrete in accordance with referenced standards. Product shall meet performance requirements established by referenced standards.
- B. 100% Inorganic formulation containing no more than the Maximum VOC content Limits of 400 g/L Concrete Protective Coatings as required by the U.S. EPA Architectural Coatings Rule.
 - 1. Meets low-VOC requirements for LEED accreditation.
- C. Finish: low gloss, satin sheen as selected by Owner.

2.02 ACCEPTABLE PRODUCTS

- A. Sika International.
- B. ChemTec One, Chemtec International
- C. Duro-Nox, Nox-Crete Products Group
- D. Liqui-Hard, W. R. Meadows.

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2.03 RELATED MATERIALS

- A. Water: Potable water

3.00 EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions under which Work of this Section will be performed. Correct conditions detrimental to timely and proper completion of Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Examine substrates surfaces, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- C. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

- A. Surfaces to be treated shall meet product requirements for surface condition.
- B. New Concrete: Clean surfaces to remove loose and foreign matter that could interfere with application or performance of products. Allow surfaces to dry completely before beginning application.
 - 1. The surface of the concrete shall be clean and free of foreign material, such as grease and coatings, that would prevent the product from penetrating into the concrete
 - 2. Acid washed concrete is unacceptable.
 - 3. Concrete shall be completely dry before start of application.
- C. Existing concrete:
 - 1. Clean all surfaces so that they are water permeable.
 - 2. Strip off coatings, sealers, paint or other contaminant that would prevent the process from penetrating into the concrete.
 - 3. Acid washing of concrete is unacceptable.
 - 4. Concrete shall be completely dry before start of application.
- D. Protect adjacent and underlying surfaces by masking or by other means.
 - 1. Protect asphalted and mastic type surfaces from spillage and heavy overspray.
 - 2. Cover aluminum and glass.

3.03 INSTALLATION

- A. Install at location(s) indicated, to comply with final shop drawings,
- B. Follow manufacturer's instructions and recommendations for application and coverage. Each product is unique in its method of application.

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- C. Materials shall be premixed and ready to use. Mixing and agitation shall be in accordance with manufacturer's directions.
- D. Method of application and equipment shall be as recommended by product manufacturer.
- E. Test application: Contractor shall treat an area and textures of the installation to establish physical and visual effects of application and absorption level to establish coverage rates.
- F. Install when concrete surface temperatures comply with manufacturer's recommended minimum standards.
- G. When the work cannot be completed in one application, location where application is stopped shall be noted and clearly marked.
- H. Do not allow hardener/sealer to dry on the floor surface without proper curing methods as this can cause discoloration in concrete.

3.04 PROTECTION

- A. Provide protection of all glass and painted surfaces from overspray.

3.05 CURING

- A. Comply with manufacturer's recommendations.

3.06 ADJUSTMENT AND CLEANING

- A. Comply with manufacturer's recommendations.
- B. Immediately upon completion of installation, clean surfaces.
- C. Remove surplus materials, rubbish and debris resulting from installation upon completion of work and leave areas of installation in neat, clean condition.
- D. Dispose of waste properly per federal, state or local environmental regulations when required.

3.07 PROTECTION

- A. Protect installation throughout construction process until date of Final Completion and acceptance by Owner.
- B. Provide protection for the installation, ensuring satisfactory operating condition at completion of Project.

END OF DOCUMENT 09612

SECTION 09622 RESILIENT SPORTS FLOOR COVERING

1.00 GENERAL

1.01 SCOPE

- A. Furnish all materials, labor, equipment, plant, tools, required to complete
 - all rubber athletic floor tile.
- B. See drawings for location of work required.

1.02 RELATED DOCUMENTS

- A. Division 9 Sections for resilient floor coverings installed in areas other than athletic activity spaces.
- B. Division 9 Section "Resilient Floor Tile" for wall base and accessories installed with floor coverings.

2.00 PRODUCT

2.01 RUBBER ATHLETIC FLOORING TILE

- A. Subject to compliance with Division 1 requirements, provide:
 - 1. Material: Recycled rubber compound with Rubber wear layer and rubber shock-absorbent layer, vulcanized together.
- B. Installation Method: Adhered.
- C. Traffic-Surface Texture: Nondirectional, stipple texture .
- D. Size: Manufacturer's standard-size square tile.
- E. Thickness: 3/8 inch.
- G. Accessories:
 - 1. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by floor covering manufacturer.
 - 2. Installation Adhesive: Water-resistant type recommended in writing by manufacturer. Use adhesive that has a VOC content of 20 g/L or less when calculated according
 - 3. Reducer Strip. Provide manufacturer's recommended reducer strip at transitions between rubber tile and other adjacent flooring materials.

3.00 EXECUTION

Read and accepted as part of the Contract:

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3.01 GENERAL.

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of sealers, and hardeners.
- B. Testing: Perform tests recommended in writing by manufacturer.
- C. Proceed with installation only after substrates pass testing.

END OF SECTION 09622

Read and accepted as part of the Contract:

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SECTION 09651 RESILIENT TILE FLOORING

1.00 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of surfaces to receive resilient materials.
- B. Resilient tile flooring.
- C. Resilient base.
- D. Resilient stair treads, risers, landings, and platforms.
- E. Adhesives, primers and underlayments.
- F. Cleaning and Protection.

1.02 RELATED SECTIONS

- A. Division 13 - Controlled Environment Rooms, for resilient flooring in controlled environment rooms.
- B. Division 14 - Elevators, for resilient flooring in elevator cabs.

1.03 SUBMITTALS: Follow Section 01330.

- A. Product Data: Describe flooring characteristics, sizes, patterns and colors available.
- B. Samples: Full color range samples for selection.
- C. Informational Submittals: Maintenance Data: Include maintenance procedures, recommended maintenance materials and suggested schedule for cleaning, stripping, and re-waxing.

1.04 QUALITY ASSURANCE

- A. Prior to installation of flooring, perform moisture tests on concrete substrate to determine if vapor transmission is sufficiently low as to not cause delamination of the finished flooring. Follow Section 09 60 05.

1.05 MOCK-UP:

- A. Provide full room mock-up, were directed, of each type of resilient flooring and base.

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- B. Approved mock-ups may remain part of the work.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Deliver material to the job site in the manufacturer's original unopened cartons, and/or packages with labels clearly defining color, type, and size of materials. Delivered materials shall be identical to the approved samples.
- B. Store roll materials in upright position.
- C. Store materials for three days prior to installation in area of installation to achieve temperature and humidity stability.
- D. Maintain 65 degrees ambient temperature and operating range of humidity for three days prior to, during, and 24 hours after installation of materials. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- E. Do not install materials until other finishing operations are completed, including painting.
- F. Close spaces to traffic during floor tile installation.
- G. Close spaces to traffic for 48 hours after floor tile installation.

1.07 MAINTENANCE MATERIALS: Follow Section 01 70 00.

- A. Provide extra flooring material in original wrapping and clearly labeled as to contents. Furnish material from same production run of that used for this Project. Quantities as follows:

| PROJECT AREA, PER TYPE OF MATERIAL | EXTRA MATERIALS |
|------------------------------------|-----------------|
| 5,000 square feet or less | 100 square feet |
| 5,000 to 15,000 square feet | 150 square feet |
| 15,001 to 50,000 square feet | 200 square feet |
| 50,001 to 100,000 square feet | 300 square feet |
| 100,000 to square feet or more | 400 square feet |

- B. Base Material: 16 linear feet of each color used.

2.00 PRODUCTS

2.01 GENERAL MATERIAL REQUIREMENTS

- A. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.

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- B. Smoke Density: Less than 450; ASTM E662.
- C. Static Coefficient of Friction: Flooring materials shall have values of not less than 0.6 for level surfaces and 0.8 for ramped surfaces.

2.02 VINYL TILE FLOORING

- A. Manufacturers: Subject to compliance with requirements, the following manufacturers and products named are acceptable; substitutions of other unnamed manufacturers are [permitted subject to Section 01 63 00] [not permitted].
 - 1. The Amtico Company, Ltd.
 - 2. Armstrong World Industries, Inc.
 - 3. Mannington, Inc.
 - 4. Tarkett Inc.
- B. Vinyl Composition Tile: 12 x 12 inch x 1/8 inch thick design. Through color construction. ASTM F1066, [Class 1-solid color] [Class 2-through-pattern].
- C. Vinyl Tile: 12 x 12 inch x [] inch thick, [] design.
- D. Feature Strips: Same material as tile; widths as needed.

2.03 RUBBER TILE FLOORING

- A. Manufacturers: Subject to compliance with requirements, the following manufacturers and products named are acceptable; substitutions of other unnamed manufacturers are [permitted subject to Section 01 63 00] [not permitted].
 - 1. Burke Mercer Flooring Products, Division of Burke Industries, Inc.
 - 2. Johnsonite Floor Products.
 - 3. Nora Rubber Flooring.
 - 4. Roppe Corporation.
- B. Rubber Tile: 12 x 12 inch x 1/8 inch thick design. Conform to ASTM F1344, Class I-Homogeneous Rubber Tile, subclass A for solid-color wear-layer or subclass B for mottled wear-layer. Minimum hardness: 85 when measured using a Shore, Type A durometer per ASTM D2240.
- C. Feature Strips: Same material as tile; widths as needed.

2.04 BASE

- A. Manufacturers: Subject to compliance with requirements, the following manufacturers and products named are acceptable; substitutions of other unnamed manufacturers are permitted subject to Section 01 63 00.
 - 1. Johnsonite Floor Products.

Read and accepted as part of the Contract:

2. Nora Rubber Flooring.
 3. Roppe Corporation.
- B. Base: ASTM F1861. Roll stock only; short lengths not acceptable. Rubber 4inch high; 1/8 inch thick; coved at sheet or tile flooring, straight at carpeted floors.

2.05 STAIR COVERING

- A. Manufacturers: Subject to compliance with requirements, the following manufacturers and products named are acceptable; substitutions of other unnamed manufacturers are permitted subject to Section 016300.
1. Johnsonite Floor Products.
 2. Nora Rubber Flooring.
 3. Roppe Corporation.
- B. Platform Tile: [Rubber;] [vinyl;] [] inch thick; [] x [] inch; raised pattern to match stair treads.
- C. Stair Treads: [Rubber;] [Vinyl;] [] inch thick, full width and depth of stair tread in one piece; [smooth] [raised [] pattern] [serrated nosing] [] design; return down edge of tread [] inch (inside dimension) with tapered thickness.
- D. Stair Risers: Sheet [rubber;] [vinyl;] [] inch thick; square edge; maintain height and length in one piece. [Treads with integral risers are acceptable.]
- E. Stair Nosing: [Rubber;] [Vinyl;] [] inch thick; [] inch [] horizontal return, [] inch return down edge of tread, full width of stair tread in one piece; [smooth] [raised [] pattern] [] design.

2.06 ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by floor covering manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor covering manufacturer for products and substrate conditions indicated.
- C. Edge Strips: Flooring material of appropriate thickness. Color to match adjacent flooring.
- D. Floor Polish: Finish protection of type recommended by flooring manufacturer.

2.07 COLORS AND PATTERNS

- A. As selected from manufacturer's standards.

3.00 EXECUTION

3.01 PREPARATION

- A. Remove existing floor finishes and clean substrate of adhesive and other residue which may prevent positive bond of new flooring.
- B. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- C. Apply, trowel, and float filler to leave a smooth, flat surface.
- D. After curing, vacuum clean substrate.
- E. Perform bond and moisture tests on concrete subfloors to determine if surfaces are sufficiently clean and dry as well as to ascertain presence of compounds which will affect the installation.
- F. Apply primer to surfaces if recommended by flooring manufacturer.

3.02 INSTALLATION - TILE

- A. Mix tile from container to ensure shade variations are consistent.
- B. Spread only enough adhesive to permit installation of materials before initial set.
- C. Set flooring in place. Press with heavy roller to attain full adhesion.
- D. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles square with room axis and in pattern indicated.
- E. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain direction quarter-turned alternating in adjacent tiles (basket-weave pattern) unless noted otherwise.
- F. At openings with doors, terminate flooring under closed door where adjacent floor finish is dissimilar.
- G. At openings without doors, terminate flooring at centerline of opening.
- H. Install edge strips at unprotected or exposed edges.

- I. Scribe flooring to walls, columns, built-in furniture, laboratory casework and cabinets, floor outlets, pipes, edgings, door frames, thresholds, nosings and other appurtenances to produce tight joints. Install under movable partitions, suspended laboratory casework, furniture and equipment, and extend into toe spaces, door reveals, alcoves and closets of each space, all without interrupting floor pattern.
- J. Install flooring in pan type floor access covers. Maintain floor pattern.
- K. Install feature strips, edge strips and floor markings where indicated. Fit joints tightly.

3.03 INSTALLATION - BASE

- A. Avoid stretching material when removing from carton.
- B. Remove base material from carton and allow it to relax and acclimate to room temperature.
- C. Fit joints tight and vertical.
- D. Miter internal corners. At external corners, 'V' cut back of base and fold to non-rounded crease. Form without producing discoloration (whitening) at bends. Do not remove more than half the wall base thickness. At exposed ends use pre-molded units.
- E. Install base on solid backing. Bond tight to wall and floor surfaces. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- F. Scribe and fit to door frames and other interruptions.
- G. Install base to all free-standing and engaged columns, and built-in furniture, laboratory casework and cabinets.
- H. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.

3.04 INSTALLATION - STAIR COVERING

- A. Install stair nosing, stair treads, and stair risers one piece for full width and depth of stair.
- B. Adhere over entire surface. Fit accurately and securely.

3.05 CLEANING AND PROTECTION

- A. Immediately after completing installation, clean floor by sweeping and vacuuming, and damp mopping, removing marks and soil. Do not wash surfaces until after time period recommended

- by manufacturer. Use cleaner recommended by flooring manufacturer to remove adhesive residue.
- B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
 - 1. Apply protective floor polish to horizontal surfaces that are free from soil, visible adhesive and surface blemishes if recommended in writing by manufacturer.
 - 2. Use commercially available product acceptable to manufacturer and in coordination with Owner's maintenance service.
 - C. If additional cleaning of rubber flooring is needed, damp mop with a neutral (pH 7-8) cleaning solution only.
 - D. Apply temporary finish protection until Substantial Completion, in accordance with manufacturer's written recommendations for each type of material installed.

END OF SECTION 09651

SECTION 09652 RESILIENT SHEET FLOORING

1.00 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes the following:
 - 1. Homogeneous consolidated vinyl chip sheet vinyl.
- B. Related Sections include the following:
 - 1. Division 9 Section "Resilient Wall Base and Accessories" for resilient wall base, reducer strips, and other accessories installed with sheet vinyl floor coverings.

1.02 SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Shop Drawings: Show location of seams and edges. Indicate location of columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutout locations.
- C. Samples for Verification: In manufacturer's standard size, but not less than 150-by-230-mm sections of each different color and pattern of sheet vinyl floor covering specified, showing the full range of variations expected in these characteristics.
 - 1. For heat-welding bead, manufacturer's standard-size samples, but not less than 230 mm long, of each color specified.
- D. Product Certificates: Signed by manufacturers of sheet vinyl floor coverings certifying that each product furnished complies with requirements.
- E. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- F. Maintenance Data: For sheet vinyl floor coverings to include in the maintenance manuals specified in Division 1.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an installer who is competent in the technique required by manufacturer for heat-welding seams.

Read and accepted as part of the Contract:

Bidder / Contractor

1. Engage installers who are certified by floor covering manufacturer for heat-welded seam installation.
- B. Source Limitations: Obtain each type, color, and pattern of sheet vinyl floor covering specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
- C. Fire-Test-Response Characteristics: Provide products with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction.
 1. Critical Radiant Flux: 0.45 W/sq. cm or greater when tested per ASTM E 648.
 2. Smoke Density: Maximum specific optical density of 450 or less when tested per ASTM E 662.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet vinyl floor coverings and installation accessories to Project site in manufacturer's original, unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store products in dry spaces protected from the weather, with ambient temperatures maintained between 10 and 32 deg C.
- C. Store rolls upright.
- D. Move sheet vinyl floor coverings and installation accessories into spaces where they will be installed at least 48 hours before installation, unless longer conditioning periods are recommended in writing by manufacturer.

1.05 PROJECT CONDITIONS

- A. Maintain a temperature of not less than 21 deg C or more than 35 deg C in spaces to receive sheet vinyl floor coverings for at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After postinstallation period, maintain a temperature of not less than 13 deg C or more than 35 deg C.
- B. Do not install sheet vinyl floor coverings until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during sheet vinyl floor covering installation and for time period after installation recommended in writing by manufacturer.

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- D. Install sheet vinyl floor coverings and accessories after other finishing operations, including painting, have been completed.
- E. Where cabinets and other items are indicated for installation on top of sheet vinyl floor coverings, install floor coverings before these items are installed.
- F. Do not install sheet vinyl floor coverings over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, as determined by floor covering manufacturer's recommended bond and moisture test.

1.06 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. Furnish not less than 3 linear m in roll form for each 150 linear m or fraction thereof, of each different composition, wearing surface, color, and pattern of sheet vinyl floor covering installed.
 - 2. Deliver extra materials to Owner.

2.00 PRODUCTS

2.01 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the following. Substitutes are acceptable subject to approval by Owner.
 - 1. Armstrong World Industries, Inc
 - 2. Forbo Industries, Inc.
 - 3. Mannington Commercial.
 - 4. Gerflor.

2.02 SHEET VINYL FLOOR COVERINGS

- A. Sheet Vinyl Floor Coverings with Backing: Products complying with ASTM F 1303 and with requirements specified in the Sheet Vinyl Floor Covering Schedule.

2.03 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by floor covering manufacturer for applications indicated.

Read and accepted as part of the Contract:

Bidder / Contractor

- B. Adhesives: Water-resistant type recommended by manufacturer to suit sheet vinyl floor covering and substrate conditions indicated.
- C. Heat-Welding Bead: Solid-strand product of floor covering manufacturer for heat-welding seams.
 - 1. Color and Pattern: Match color and pattern of sheet vinyl floor covering.
- D. Cove Strip: 25.4-mm-radius support for integral flash cove base provided or approved by floor covering manufacturer.
- E. Cove-Base Cap Strip: Square metal, vinyl, or rubber cap for integral flash cove base provided or approved by floor covering manufacturer.

3.00 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions where installation of sheet vinyl floor coverings will occur, with Installer present, for compliance with manufacturer's requirements. Verify that substrates and conditions are satisfactory for floor covering installation and comply with requirements specified.
- 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 floor covering manufacturer.
 - 2. Subfloor finishes comply with requirements specified in Division 3 Section "Cast-in-Place Concrete" for slabs receiving resilient flooring.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. General: Comply with sheet vinyl floor covering manufacturer's written installation instructions for preparing substrates indicated to receive sheet vinyl floor coverings.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.

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- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Broom and vacuum clean substrates to be covered immediately before installing sheet vinyl floor coverings. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.03 INSTALLATION

- A. General: Comply with sheet vinyl floor covering manufacturer's written installation instructions.
- B. Unroll sheet vinyl floor coverings and allow them to stabilize before cutting and fitting, if recommended in writing by manufacturer.
- C. Lay out sheet vinyl floor coverings to comply with the following requirements:
 - 1. Maintain uniformity of sheet vinyl floor covering direction.
 - 2. Arrange for a minimum number of seams and place them in inconspicuous and low-traffic areas, and not less than 150 mm away from parallel joints in flooring substrates.
 - 3. Match edges of sheet vinyl floor coverings for color shading and pattern at seams according to manufacturer's written recommendations.
 - 4. Avoid cross seams.
- D. Scribe, cut, and fit sheet vinyl floor coverings to butt neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- E. Integral Flash Cove Base: Cut sheet vinyl floor coverings to form integral base of 152mm or height indicated at vertical surfaces.
- F. Extend sheet vinyl floor coverings into toe spaces, door reveals, closets, and similar openings.
- G. 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 chalk or other nonpermanent, nonstaining marking device.
- H. Adhere sheet vinyl floor coverings to flooring substrates to comply with floor covering manufacturer's written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.
 - 1. Produce completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

Read and accepted as part of the Contract:

Bidder / Contractor

2. Form integral flash cove base by flashing floor covering up vertical surfaces. Support floor covering at horizontal and vertical junction with cove strip. Butt floor covering at top of base against cap strip.
- I. Heat-Welded Seams: Rout joints and heat weld with welding bead, permanently fusing sections into a seamless floor covering. Prepare, weld, and finish seams according to manufacturer's written instructions and ASTM F 1516 to produce surfaces flush with adjoining floor covering surfaces.
- J. Hand roll sheet vinyl floor coverings in both directions from center out to embed floor coverings in adhesive and eliminate trapped air. At walls, door casings, and other locations where access by roller is impractical, press floor coverings firmly in place with flat-bladed instrument.

3.04 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing sheet vinyl floor coverings:
 1. Remove adhesive and other surface blemishes using cleaner recommended by floor covering manufacturer.
 2. Sweep or vacuum floor thoroughly.
 3. Do not wash floor covering until after time period recommended by floor covering manufacturer.
 4. Damp-mop floor to remove marks and soil.
- B. Protect flooring against mars, marks, indentations, and other 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 floor covering manufacturer.
 1. Apply protective floor polish to sheet vinyl floor covering surfaces that are free from soil, visible adhesive, and surface blemishes, if recommended in writing by manufacturer.
 - a. Use commercially available product acceptable to floor covering manufacturer.
 - b. Coordinate selection of floor polish with Owner's maintenance service.
 2. Cover sheet vinyl floor coverings with undyed, untreated building paper until inspection for Substantial Completion.
 3. Do not move heavy and sharp objects directly over sheet vinyl floor coverings. Place plywood or hardboard panels over floor coverings and under objects while they are being moved. Slide or roll objects over panels without moving panels.
- C. Clean sheet vinyl floor coverings not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean floor coverings according to manufacturer's written recommendations.

1. Before cleaning, strip protective floor polish that was applied after completing installation only if required to restore polish finish and if recommended by floor covering manufacturer.
2. After cleaning, reapply polish to floor surfaces to restore protective floor finish according to floor covering manufacturer's written recommendations. Coordinate with Owner's maintenance program.

3.05 SHEET VINYL FLOOR COVERING SCHEDULE

- A. Sheet Vinyl with Backing. Where this designation is indicated, provide sheet vinyl floor covering with backing complying with the following: Color and texture must exactly match the following.
1. Products: As follows:
 - a. SV-1, Equal or superior to ARMSTRONG, MEDINTECH, with matching WELD ROD.
 3. Color and Pattern: Homogeneously consolidated vinyl chip.
 4. Type : Type II, Grade A
 5. Wear-Layer Thickness: Minimum Grade 1 thickness according to ASTM F 1303 for Type II.
 6. Overall Thickness: 2.0mm wear layer
 7. Wearing Surface: Smooth.
 8. Backing Class: no backing
 9. Sheet Width: 1.83M wide X up to 27.4M.
 10. Seaming Method: Heat welded

END OF SECTION 09652

SECTION 09661 STATIC-CONTROL RESILIENT FLOOR COVERINGS

1.00 GENERAL

1.01 SCOPE

- A. Preparation of surfaces to receive resilient materials.
- B. Static-Control Resilient tile flooring.
- C. Adhesives, primers and underlayments.
- D. Cleaning and Protection.

1.02 RELATED SECTIONS

- A. Section 09605 - Vapor transmission testing of concrete floors.
- B. Section 09650 - Resilient Tile: resilient base.

1.03 SUBMITTALS: Follow Section 01330.

- A. Product Data: Describe flooring characteristics, sizes, patterns and colors.
- B. Informational Submittals: Maintenance Data: Include maintenance procedures, recommended maintenance materials and suggested schedule for cleaning, stripping, and re-waxing.

1.04 QUALITY ASSURANCE

- A. Prior to installation of flooring, perform moisture tests on concrete substrate to determine if vapor transmission is sufficiently low as to not cause delamination of the finished flooring. Follow Section 09605.

1.05 MOCK-UP: Follow Section 01450.

- A. Provide full room mock-up, where directed, of flooring.
- B. Approved mock-ups may remain part of the work.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Store materials for three days prior to installation in area of installation to achieve temperature and humidity stability.
- B. Maintain 65 degrees ambient temperature and operating range of humidity for three days prior to, during, and 24 hours after installation of materials.

Read and accepted as part of the Contract:

Bidder / Contractor

- C. Do not install materials until other finishing operations are completed, including painting.
- D. Deliver material to the job site in the manufacturer's original unopened cartons, and/or packages with labels clearly defining color, type, and size of materials. Delivered materials shall be identical to the approved samples.

1.07 MAINTENANCE MATERIALS:

- A. Provide extra flooring material in original wrapping and clearly labeled as to contents. Furnish material from same production run of that used for this Project. Quantities as follows:

| PROJECT AREA, PER TYPE OF MATERIAL | EXTRA MATERIALS |
|------------------------------------|-----------------|
| 5,000 square feet or less | 100 square feet |

2.00 PRODUCTS

2.01 GENERAL MATERIAL REQUIREMENTS

- A. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.
- B. Smoke Density: Less than 450; ASTM E662.
- C. Static Coefficiency of Friction: Flooring materials shall have values of not less than 0.6 for level surfaces and 0.8 for ramped surfaces, ASTM D2047.
- D. Static Load: 2,500 psi @ 0.005"RI, ASTM F970 (modified).
- E. Electrical Resistance: Point to Ground 1,000,000 – 100,000,000 Ohms, ASTM F150.

2.02 MANUFACTURERS

- A. Manufacturers listed are approved. Substitutions are permitted subject to Section 01630.

2.03 STATIC DISSIPATIVE TILE

- A. Manufacturers:
 - 1. AB ElectroStatic.
 - 2. Flexco.
 - 3. VPI
- B. Tile: VCT-7 CIT Room: Armstrong, Light Grey. 12 x 12 inch x 1/8 inch thick. Through color construction. FS SS-T-312B and ASTM F1700, Type III, Composition 1 - Asbestos Free.
 - 1. Electrical Resistance Range: 1.0 X 10⁶ and 1.0 X 10⁸ at 500 volts DC.
 - 2. Static Decay: 5,000 volts to zero in less than 0.25 seconds in accordance with Federal Test Method 101B, Method 4046 at 15 per cent relative humidity.
- C. Accessories, Adhesives, and Grounding Tape: Types recommended by flooring manufacturer.

Read and accepted as part of the Contract:

Bidder / Contractor

2.04 ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by floor covering manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor covering manufacturer for products and substrate conditions indicated.
- C. Edge Strips: Color to match adjacent flooring.
- D. Floor Polish: Finish protection of type recommended by flooring manufacturer.

2.05 COLORS AND PATTERNS

- A. As selected from manufacturer's standards. Refer to Finish Legend on drawing A7.00 for design standard selections.

3.00 EXECUTION

3.01 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- B. Apply, trowel, and float filler to leave a smooth, flat surface.
- C. After curing, vacuum clean substrate.
- D. Apply primer to surfaces if recommended by flooring manufacturer.

3.02 INSTALLATION

- A. Mix tile from container to ensure shade variations are consistent.
- B. Spread only enough adhesive to permit installation of materials before initial set.
- C. Set flooring in place. Press with heavy roller to attain full adhesion.
- D. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles square with room axis.
- E. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

- F. At openings with doors, terminate flooring under closed door where adjacent floor finish is dissimilar.
- G. At openings without doors, terminate flooring at centerline of opening.
- H. Install edge strips at unprotected or exposed edges.
- I. Scribe flooring to walls, columns, built-in furniture, laboratory casework and cabinets, floor outlets, pipes, edgings, door frames, thresholds, nosings and other appurtenances to produce tight joints. Install under movable partitions, suspended laboratory casework, furniture and equipment, and extend into toe spaces, door reveals, alcoves and closets of each space, all without interrupting floor pattern.
- J. Install flooring in pan type floor access covers. Maintain floor pattern.
- K. Install feature strips, edge strips and floor markings where indicated. Fit joints tightly.
- L. Connect copper grounding strip to a stranded ground wire, cut off excess and recess into the wall or ground to a column or beam by drilling and taping the column and affixing the grounding strip to the column in accordance with the manufacturer's instructions.
- M. Lay the balance of the grounding strip into the adhesive covering it with additional adhesive. Install the flooring over the grounding strip.
- N. Prohibit traffic on the finished floor for 48 hours after installation.

3.03 INSTALLATION - BASE

- A. Avoid stretching material when removing from carton.
- B. Remove base material from carton and allow it to relax and acclimate to room temperature.
- C. Fit joints tight and vertical.
- D. Miter internal corners. At external corners, 'V' cut back of base and fold to non-rounded crease. Form without producing discoloration (whitening) at bends. Do not remove more than half the wall base thickness. At exposed ends use pre-molded units.
- E. Install base on solid backing. Bond tight to wall and floor surfaces. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- F. Scribe and fit to door frames and other interruptions.
- G. Install base to all free-standing and engaged columns, and built-in furniture, laboratory casework and cabinets.
- H. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.

Read and accepted as part of the Contract:

Bidder / Contractor

3.04 CLEANING AND PROTECTION

- A. Immediately after completing installation, clean floor by sweeping and vacuuming, and damp mopping, removing marks and soil. Do not wash surfaces until after time period recommended by manufacturer. Use cleaner recommended by flooring manufacturer to remove adhesive residue.
- B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
 - 1. Apply protective floor polish to horizontal surfaces that are free from soil, visible adhesive, and surface blemishes if recommended in writing by manufacturer.
 - 2. Use commercially available product acceptable to manufacturer and in coordination with Owner's maintenance service.
- C. If additional cleaning of rubber flooring is needed, damp mop with a neutral (pH 7-8) cleaning solution only.
- D. Apply temporary finish protection until Substantial Completion, in accordance with manufacturer's written recommendations for each type of material installed.

END OF SECTION 09661

Read and accepted as part of the Contract:

Bidder / Contractor

SECTION 09671 RESINOUS FLOORING

1.00 GENERAL

1.01 SCOPE

- A. This section specifies a seamless flooring system with integral base.
- B. Flooring consists of epoxy resin, aggregate, and finish coats for non-slip finish.

1.02 RELATED WORK

Color and room finish schedule..

1.03 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Description of product to be provided; technical data showing compliance with specifications.
 - 2. Application and installation instructions, including proposed deviations from specifications.
- C. Samples:
 - 1. Each color proposed in SCHEDULE FOR FINISHES.
 - 2. Sample 300 mm (12-inch) square in each finish specified.
 - 3. Sample showing construction from substrate to finish surface in thickness specified.
- D. Certification and Approval:
 - 1. Manufacturer's certification of material compliance.
 - 2. Manufacturer's approval of installers.
 - 3. Contractor's certificate of compliance with Quality Assurance requirements.
- E. Warranty: Manufacturer's warranty of materials and installation.

1.04 QUALITY ASSURANCE

- A. Single Source Responsibility:
 - 1. Obtain primary resinous flooring materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer.
 - 2. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.
- B. Installer trained and approved by manufacturer of primary material and having completed at least five projects of similar size and complexity.
- C. Pre-Installation Conference

Read and accepted as part of the Contract:

Bidder / Contractor

1. Arrange a meeting not less than thirty days prior to starting work.
2. Attendance
 - a. Contractor
 - b. Resident Engineer
 - c. Manufacturer and Installer's Representative

1.05 MATERIAL PACKAGING DELIVERY AND STORAGE

- A. Deliver materials to the site in original sealed packages or containers, clearly marked with the manufacturer's name or brand, type and color, production run number and date of manufacture.
- B. Protect materials from damage and contamination in storage.
- C. Maintain temperature of storage area between 15°C and 32°C (60° and 90°F).
- D. Package materials in factory pre-weighed and in single, easy to manage batches sized for ease of handling and mixing proportions from entire package or packages.

1.06 WARRANTY

- A. Extend standard warranty period to minimum of three years.

1.07 APPLICABLE PUBLICATIONS

- A. The publication listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - B221-06Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
 - C267-01 (R2006)Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing
 - C413-01 (R2006)Absorption of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing, and Polymer Concretes
 - C580-02 (R2008)Flexural Strength and Modulus of Elasticity of Chemical Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes
 - C722-04Chemical-Resistant Resin Monolithic Surfacing

Read and accepted as part of the Contract:

- C811-98 (R2008) Surface Preparation of Concrete for Application of Chemical-Resistant Resin Monolithic Surfacing
- C882-05 Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear
- D2047-04 Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
- C. National Association of Architectural Metal Manufacturers (NAAMM):
AMP 501 Finishes for Aluminum

2.00 PRODUCTS

2.01 SYSTEM DESCRIPTION

- A. Epoxy resinous flooring includes concrete epoxy primer, colored quartz aggregate epoxy resin mortar, clear epoxy sealer coat, and finish coat for non-slip finish.
- B. System resistant to chemicals and abrasion.

2.02 EPOXY FLOORING SYSTEM

- A. Conform to ASTM C722, Type A, Epoxy resin, quartz aggregate.
- B. Physical Properties of flooring system addition to C722 when tested as follows:

Read and accepted as part of the Contract:

Bidder / Contractor

| Property | Test | Value |
|--|---|--|
| Hardness | ASTM D2240 Shore Durometer | 75-80 |
| Bond | ASTM C882 Bonding epoxy flooring to hardened concrete | min 400 psi |
| Water Absorption | ASTM C413 | max 0.1 percent |
| Abrasion Resistance | ASTM D4060 Taber Abrader CS-17 wheel, 1000 gm load; 1000 cycle | max 0.10 gms. weight loss |
| Flexural Strength | ASTM C580 | min 2200 psi |
| Extent of Burning extinguishing Heat Resistant | ASTM D635 For continuous exposure min 140 deg. F For intermittent spills min 200 deg. F | max 0.25 inch self No Effect No Effect |
| Coefficient of Friction | ASTM D 2047 | 0.7 |
| Chemical Resistance of the following: | ASTM C267 | No Effect |
| Acetic acid | 5 percent | |
| Ammonium hydroxide | 10 percent | |
| Citric Acid | 50 percent | |
| Fatty acid Motor Oil, 20W | | |
| Hydrochloric acid | | |
| Salt water | 10 percent | |
| Sodium Hydroxide | 10 percent | |
| Sulfuric acid | 10 percent | |
| Trisodium phosphate | 10 percent | |
| | 5 percent | |
| Urine | | |
| Feces | | |
| Hydrogen peroxide | 28 percent | |
| Distilled Water | | |
| Sodium Hypochloride | 5.28 percent | |

- C. Primer, Coloring, Sealer, and Finish coats as standard with manufacture of flooring system.
- D. Base cap: Extruded aluminum, clear anodized finish.

2.03 BASE CAP STRIP

- A. Aluminum, Extruded: ASTM B221, Alloy 6063-T6.

Read and accepted as part of the Contract:

- B. Shape for 5 mm (3/16 inch) depth of base material, "J" configuration.
- C. Finish:
 - 1. Finish exposed surfaces in accordance with NAAMM Metal Finishes Manual.
 - 2. Aluminum: NAAMM Amp 501:
 - a. Clear anodic coating, AA-C22A41 chemically etched medium matte, with Architectural Class 1, 0.7 mils or thicker.
 - b. Colored anodic coating, AA-C22A42, chemically etched medium matte with Architectural Class 1, 0.7 mils or thicker.

3.00 EXECUTION

3.01 PROJECT CONDITIONS

- A. Maintain temperature of materials above 21°C (70 degrees F), for 48 hours before installation.
- B. Maintain temperature of rooms where work occurs, between 21°C and 32°C (70°F and 90°F) for at least 48 hours, before, during, and 24 hours after installation. Maintain temperature at least 21°C (70 degrees F) thereafter.
- C. Do not install materials until building is permanently enclosed and wet construction is complete, dry, and cured.
- D. Concrete substrate cured and not less than 30 days old.
- E. Area free of other trades during and for a period of 24 hours after installation.

3.02 INSTALLATION REQUIREMENTS

- A. The respective manufacturer's instructions for application and installation will be considered for use when approved by the Construction Manager or Owner's Representative..
- B. Submit proposed installation deviation from this specification to the Resident Engineer indicating the differences in the method of installation.

3.03 PREPARATION

- A. Prepare surface in accordance with ASTM C811 except where specific manufacturers instructions supersede.
- B. Mechanically remove bond inhibiting materials and loose or laitance materials to ensure bond.
- C. Prepare wall and set base cap mold level.
 - 1. Fill voids within the height of the wall where base is applied even with the wall surface.

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2. Grind, sand, or cut away protrusions.

3.04 APPLICATION

- A. Mix and apply each component of resinous flooring system in compliance with manufacturer's specifications to produce a uniform monolithic flooring surface of 5 mm (3/16 inch) minimum thickness.
- B. Turn flooring up for covered 100 mm (4-inch) high base at vertical wall surfaces and penetrations. Cove joint with floor; 6 mm (1/4 inch) radius. Round interior and external corners.
- C. Apply primer over prepared substrate at manufacturer's specified rate. Coordinate timing of primer application with application of troweled mortar to ensure optimum adhesion between resinous flooring materials and substrate.
- D. Uniformly spread mortar over substrate adjusted to manufacturer's recommended maximum thickness to plane line of floor.
- E. Trowel finish for smooth surface on base and coved surface.
- F. Grout mortar surface as specified by manufacturer and broad cast colored quartz aggregate uniformly distributed for non-slip texture on floors to within one inch of base cove horizontal edge.
- G. Apply a clear finish coat.

3.05 CURING, PROTECTION AND CLEANING

- A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process.
- B. Close area of application for a minimum of 24 hours.
- C. Protect resinous flooring materials from damage and wear during construction operation.
 1. Cover flooring with kraft paper.
 2. Covers paper with 6 mm (1/4 inch) thick hardboard, plywood, or particle board where area is in foot or vehicle traffic pattern, rolling or fixed scaffolding and overhead work occurs.
- D. Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

3.06 TOLERANCE

- A. From line of plane: Maximum 3 mm (1/8 inch) in total distance of flooring and base.
- B. From radius of cove: Maximum of 3 mm (1/8 inch) plus or 1.6 mm (1/16-inch) minus.

Read and accepted as part of the Contract:

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END OF SECTION 09671

Read and accepted as part of the Contract:

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SECTION 09680

CARPET TILE

1.00 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of surfaces to receive carpet.
- B. Carpet tile and accessories.

1.02 RELATED SECTIONS

- A. Section 09605 - Vapor Transmission Testing, for vapor transmission testing of concrete floors.
- B. Section 09651 - Resilient Tile Flooring, for resilient base.

1.03 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation methods.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Existing flooring materials to be removed.
 - 3. Existing flooring materials to remain.
 - 4. Carpet tile type, color, and dye lot.
 - 5. Type of subfloor.
 - 6. Type of installation.
 - 7. Pattern of installation.
 - 8. Pattern type, location, and direction.
 - 9. Pile direction.
 - 10. Type, color, and location of insets and borders.
 - 11. Type, color, and location of edge, transition, and other accessory strips.
 - 12. Transition details to other flooring materials.
- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge Stripping and Accessory: 12-inch- (300-mm-) long Samples.

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- D. Product Schedule: Use same room and product designations indicated on Drawings and in schedules.
- E. Maintenance Data: For carpet tile to include in maintenance manuals specified in Division 01. 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.

1.04 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.
- B. Single-Source Responsibility: Obtain each type of carpet tile from one source and by a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Mockups: Before installing carpet tile, build mockups to verify selections made and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.
- E. Characteristics:
 - 1. Yarn System: 100% Invista Type 6,6; Solutia Type 6,6; BASF Type 6
 - 2. Dye Method: 100% Solution Dyed
 - 3. Construction: Tufted
 - 4. Texture: Textured loop or cut/loop
 - 5. Gauge: Minimum 1/10 4.6. Stitches per Inch: Minimum 9
 - 6. Pile Weight: 18-20 oz. per yard (high traffic areas) 20-26 oz per yard (medium traffic areas)
 - 7. Backing: Polyolefin, polypropylene, polyvinyl butryal or urethane
 - 8. Soil/Stain Resistance: Application by fiber producer and manufacturer required
 - 9. Should comply with Carpet and Rug Institute Green Label Plus program.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with CRI 104, Section 5, "Storage and Handling."
- B. Deliver materials to Project site in original factory wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.
- C. Store materials on-site in original undamaged packages, inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity. Lay flat, with continuous blocking off ground.

Read and accepted as part of the Contract:

1.06 PROJECT CONDITIONS

- A. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."
- B. Space Enclosure and Environmental Limitations: Do not install carpet tile until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is completed and tested, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy, beginning at least 24 hours before work begins.
- C. Alkalinity Conditions: Do not install carpet tile 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, or a pH range of 5 to 9 when subfloor is wetted with potable water and pHydron paper is applied, whichever is more stringent.
- D. Moisture emission rate of not more than 3 lb/1000 sq. ft./24 hours (14.6 kg/1000 sq. m/24 hours) when tested by calcium chloride moisture test in compliance with CRI 104, 6.2.1, with subfloor temperatures not less than 55 degrees F (12.7 degrees C).
- E. Where demountable partitions or other items are indicated for installation on top of carpet tile, install carpet tile before installing these items.

1.07 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Carpet Tile Warranty: Written warranty, signed by carpet tile manufacturer agreeing to replace carpet tile that does not comply with requirements or that fails within specified warranty period. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, delamination, and dimensional instability..
 - 1. Warranty Period: 15 years from date of Substantial Completion.

1.08 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. Materials shall be from the same mill run as material used in the Project.
 - 1. Carpet Tile: Before installation begins, furnish quantity of full-size units equal to 5 percent of amount installed for each type indicated, but not less than two unopened boxes from same run, whichever is greater.

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2.00 PRODUCTS

2.01 CARPET TILE

- A. Subject to approval by Owner and to requirements in previous paragraphs.

2.02 ACCESSORIES

- A. Concrete-Slab Primer: Nonstaining type as recommended by carpet tile manufacturer.
- B. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided by or recommended by carpet tile manufacturer.
- C. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and that is recommended by carpet tile manufacturer.

3.00 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Verify that substrates and conditions are satisfactory for carpet tile installation and comply with requirements specified.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710, requirements of carpet tile manufacturer, and the following. In cases of conflicting requirements, the more stringent shall apply:
 - 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 specified herein and as recommended by carpet tile manufacturer.
 - a. Moisture test method shall be in accordance with in situ probes, per ASTM F2170, in lieu of method employing anhydrous calcium chloride (ASTM F 1869) referred to in ASTM F 710.
 - 2. Subfloor finishes comply with requirements specified in Section 03 33 00 "Cast-in-Place Concrete" for slabs receiving carpet tile.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Level subfloor within 1/4 inch in 10 feet, noncumulative, in all directions. Sand or grind protrusions, bumps, and ridges. Patch and repair cracks and rough areas. Fill depressions.
 - 1. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- 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. Broom and vacuum clean substrates to be covered immediately before installing carpet tile. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Concrete-Subfloor Preparation: Apply concrete-slab primer, according to manufacturer's directions, where recommended by carpet tile manufacturer.

3.03 INSTALLATION

- A. General: Comply with CRI 104, Section 13, "Carpet Modules (Tiles)."
- B. Installation Method: Glue-down; install every tile with releasable adhesive.
- C. 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.
- D. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- E. 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.
- F. Install pattern parallel to walls and borders.

3.04 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.

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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 15, "Protection of 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 and Installer that ensure carpet tile is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09680

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SECTION 09900 PAINTING

1.00 GENERAL

1.01 SCOPE

- A. Furnish all materials, labor, equipment, plant, and tools.
- B. See drawings for location, quantity and extent of surfaces to receive paint and varnish.
- C. Field painting and finishing of each and every exposed surface on the Project, except, the following surfaces do not require field painting unless scheduled:
 - 1. Areas scheduled "unpainted", except woodwork, ungalvanized metal or unprimed metal therein.
 - 2. Exterior cast-in-place or pre-cast concrete.
 - 3. CMU masonry.
 - 4. Stainless steel, brass, bronze, copper or aluminum; except mill finish aluminum.
 - 5. Joint sealers except acrylic latex.
 - 6. Acoustical ceilings including suspension system.
 - 7. Valves, controls, and sprinkler heads.
 - 8. Name plates on equipment.
 - 9. Copper or stainless steel pipe. Paint all other exposed pipe.
 - a. Exposed Pipe shall mean pipe open to view in the completed construction.
 - b. Concealed Pipe shall mean pipe within floors, walls and above finished ceilings not open to view in the completed construction.
 - 10. Finish hardware except lacquered door closers and other hardware with USP finish.
 - 11. Light fixtures.
 - 12. Galvanized metal gratings.
 - 13. Items with factory finish (not primer paint), except as specified to receive additional field applied finish coats.

1.02 WORK IN OTHER SECTIONS

The Painting Contractor shall examine the drawings and specifications for the section being painted and for painting work in other sections for possible conflict in work.
The Painting Contractor shall also examine all the surfaces to be finished under the contract and see that the work of other trades has been left or installed in satisfactory condition to receive the paint, stain, or specified finish.

1.03 PROTECTION OF WORK

The Painting Contractor shall protect his work and the work of other contractors against damage or injury caused by paint application.

1.04 WORKMANSHIP

Read and accepted as part of the Contract:

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- A. The paint shall be applied only by skilled painters to the method specified so as to form a film of uniform thickness, free from sags, runs, crawls, or other defects.
- B. For painted work, each succeeding coat shall differ slightly in color or tint from that of the preceding coat.
- C. The Painting Contractor shall include in his work all final clean-up of paint spots on the floor, glass and finish hardware.

1.05 MATERIALS STORAGE

- A. All materials shall be provided to the job site in clean, sealed, original containers with all labels and other markings intact. Materials will be stored in the area designated and all storage areas will be kept neat, clean and locked.
- B. A room or rooms in the premises shall be assigned for the storage of painting tools and materials. Protect the floor with drop cloths or building paper. Place cloth and cotton waste in covered metal containers, or destroy them at the end of each work day.
- C. All painting materials shall be received and mixed in an assigned room to avoid pilferage and maintain quality control. All necessary precautions shall be taken to prevent fire by complying with all applicable local Fire Prevention and Safety Ordinances.

1.06 COLORS

- A. All colors are to be selected or approved by the Architect or his authorized representative and actual color chips shall be supplied to the Contractor for matching.
- B. All undercoats shall be tinted to approximate the finish coat color.

1.07 SUBMITTALS

- A. **TEST PANELS:** Prepare sample panels of selected color or shade on 300 mm by 300 mm (12" by 12") plywood panels for approval by the Architect. Colors may not be the manufacturer's standard color. Special color shall be provided as required.
- B. **Product List:** Manufacturer's list of trademarked products for each coat of each system.
- C. **Product Data:** Describe the following:
 - D. Vehicle type.
 - E. Percent solids by volume.
 - F. Method of application.
 - G. Rate of coverage and dry film thickness for each coat.
 - H. Instructions for substrate preparation including priming.
 - I. Recommended ambient temperature and relative humidity range, substrate temperature, moisture content and alkalinity at time of application.
 - J. Recommendations which differ from specified requirements.
 - K. VOC Compliance.
 - L. Informational Submittals:

- M. Certificates and/or test reports showing that products meet specified regulatory requirements.
- N. Statement of applicator qualifications.

1.08 FIRE PREVENTION

Every precaution will be taken by the Contractor to prevent fires. At the end of each day's work, all oily rags, empty containers and combustible material will be removed from the premises. Seal all paint and varnish containers with remaining content and store outside the construction site.

1.09 MOCK-UP: Follow Division 1.

Provide one mock-up panel of each finish specified, 48 inches long by 24 inches wide, showing color, texture and degree of gloss. Approved mock-up may [not] remain part of the work.

1.10 ENVIRONMENTAL REQUIREMENTS: Unless required otherwise by coating manufacturer, comply with the following:

- A. Provide continuous ventilation and heating to maintain surface and ambient temperatures above 50 degrees F for 24 hours before, during, and 48 hours after application of finishes.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F interior; 50 degrees F exterior.
- D. Minimum Application Temperature for Varnish Finishes: 65 degrees F, interior or exterior.
- E. Provide lighting level of 80 foot candles measured mid-height at substrate surface.
- F. Do not apply coatings in areas where dust is being generated.

1.11 MAINTENANCE MATERIALS:

- A. Provide full containers of paints and finishes in sealed one gallon cans, matching colors and types used. Label each container with color, gloss, and manufacturer's label. Quantity:
 - 1. Colors using 1 to 19 gallons: One gallon.
 - 2. Colors using 20 to 49 gallons: Two gallons.
 - 3. Colors using 50 gallons or more: Five gallons.

2.00 PRODUCT

2.01 MATERIALS

Read and accepted as part of the Contract:

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~~Refer to the Summary of Materials and Finishes.~~

- A. Use materials in accordance with the manufacturer's directions printed on the labels unless otherwise approved by the Owner's Representative.
- N. Coatings shall have good flow and application properties; capable of drying or curing free of streaks or sags.
- O. Materials for each application shall be compatible with one another and with other materials with which they may come in contact.
- P. Provide accessory materials as recommended by coating manufacturer, whether or not specified, as required to achieve specified finishes.
- Q. Substitutions proposed shall include manufacturer's recommendations regarding surface preparation, primers and rate of coverage, which may differ from systems specified.
- R. Gloss Ranges; ASTM D523:

| Paint Type | Test Method | Gloss Range |
|------------|-----------------|-------------|
| Flat | 85 degree meter | Below 15 |
| Eggshell | 60 degree meter | 5 to 20 |
| Satin | 60 degree meter | 15 to 35 |
| Semi-Gloss | 60 degree meter | 30 to 65 |
| Gloss | 60 degree meter | Over 65 |

2.02 SURFACE PREPARATION

- A. Masonry (new surface)
 - 1) All areas to be painted must be dry and free of dirt, grease, oil, dust, loose grit or mortar and other contaminants.
 - 2) Treat with Concrete Neutralizer at least a week prior to painting. Apply sufficient coats, let dry, then brush off white crystals that form on the surface.
 - 3) Apply one coat Concrete Primer & Sealer.
 - 4) Fill up all hairline cracks and crevices with Concrete Putty. Allow to dry, sand smooth, dust off, then spot prime before applying finish coats.
- C. Wood (new surface)
 - 1) All areas to be painted must be dry and free of dirt, dust, grease, oil and other foreign matter.
 - 2) Sand surface until wood is smooth to touch and no splinters or rough edges remain.
 - 3) Dust off completely, then wipe with clean rag.
 - 4) Apply one coat of Interior Primer & Sealer or Exterior Wood Primer.
 - 5) Fill nail holes, cracks, dents and damaged areas with Plastic Wood Dough or Glazing Putty.
- D. Metal (new surface)

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- 1) Remove dust, dirt, grease, oil, wax, loose scales and other contaminants by wiping with rag soaked in lacquer thinner or naphtha.
- 2) Sand, wire brush or scrape all rusty metal exposed to the weather for some time.
- 3) Treat surface with Rust Converter. Let stand overnight, then wipe off white residue with clean rag soaked in lacquer thinner or naphtha.
- 4) Apply one coat Red oxide or Red Lead or Zinc Chromate Primer. Let dry overnight before finishing with one or two coats of recommended topcoat.

2.03 COLORS

The following information is given to convey a general intent as to color scheme required. Owner to accept finish colors and schemes based on mock-up approval.

- A. For most wall surfaces, one light color will be designated.
- B. Deep accent colors will be designated for approximately [10] percent of wall surfaces. Not more than [3] deep accent colors will be required. Small scope surfaces will be painted in one or more accent colors.
- C. Painted doors will generally be painted in one accent color. Where painted doors occur in accent color walls, doors and frames will be same accent color unless otherwise designated. Door frames will be same color as adjacent wall, or same color as doors, as directed. Paintable sealants at frames shall be same color as wall.
- D. A designated color may be required in one or more types and sheens of paint depending upon paint system specified for each specific surface.
- E. Matching colors shall be exact. Manufacturer's nearest standard color will not be acceptable.

3.00 EXECUTION

3.01 APPLICATION

- A. Employ only experienced, skilled craftsmen and apply as per manufacturer's written specifications.
- B. Paint shall be applied by a brush, roller or spray in accordance with the manufacturer's directions. All materials when brushed, shall be evenly flowed on with brush best suited for the type of material being applied. When using roller, the covers shall be carpet, velvet back or high pile sheep wool best suited for materials and texture specified by the Architect. Sprayed paint shall be uniformly applied with suitable equipment.
- C. Exposed surfaces shall mean all areas visible when all permanent or built in fixtures, etc., are in place in all areas specified or scheduled to be painted. Painted surfaces in back of movable equipment and furniture. Paint all inside metal and plastered surfaces visible through the above specified equipment covers.

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- D. Access panels, electrical panels, louvers, exposed conduits, primed outlet covers, primed wall and ceiling plates and other primed items they occur unless otherwise specified in Painting Schedule. Paint the back sides of access panels, removable or hinged covers and the like.
- E. Do not apply exterior paint in damp, rainy weather. Do not apply interior paint when in the Architect's opinion, satisfactory results cannot be obtained due to high humidity and excessive temperature. However, failures of the Architect to notify the Contractor shall not relieve the Contractor of responsibility to produce satisfactory results.

3.02 PROTECTION

- A. Protect or remove all exposed finished hardware, lighting fixtures and accessories, plumbing fixtures and accessories, glasses and the like so that these are not stained during painting operations. Reinstall them after completion of works.
- B. Tape and cover with craft paper or equal all other surfaces which would be endangered by stains or paint marks.
- C. Repair any damage done. Refinish any work made necessary by defective workmanship for material or carelessness of other crafts.
- D. Post "WET PAINT" signs. Close off newly painted areas where possible. Remove signs when paint has dried.

3.03 WORKMANSHIP IN GENERAL

- A. Mix paint with proper consistency. Apply paints evenly and brush efficiently to minimize brush marks.
- B. Stir paint thoroughly to keep pigment in even suspension when paint is being applied.
- C. Except as otherwise directed by the Architect, apply paints in three coats (priming, body and finish). Allow each coat to dry thoroughly before the succeeding coat is applied. In general, unless otherwise instructed by the Architect, provide not less than 48 hours as the time between the application of succeeding coats. Let the Architect or his representative inspect and approve each coat before the succeeding coat is applied.
- D. If surfaces are not fully covered or cannot be satisfactorily finished in the number of coats specified, apply subsequent coats to attain the desired evenness of paint without extra cost to the Owner.
- E. Touch up knots, pitch steaks, sappy spots, etc. where finish calls for interior paints or enamel. For exteriors, use any approved sealer.
- F. Sand smooth woodwork to be finished with enamel or varnish. Use fine sand paper between coats of enamel or varnish applied to wood or metal to produce an even smooth surface.
- G. Do not paint exterior while surface is damp or during rainy or damp weather.
- H. Do necessary puttying of nail holes, cracks, etc. after the prime had been applied. Bring putty flush with adjoining surface in a neat, workmanlike manner.
- I. Tint undercoats of paint or enamel to same or approximate shade of final coat.
- J. Protect to remove hardwares, hardware accessories, plates, lighting fixtures and other similar items during the painting operation and reinstall them after completion of work.

3.04 VARNISHING

- A. Sand thoroughly all woodwork surfaces to be varnished. Fill carefully all cracks, nail holes and other defects with first-quality colored or white putty tinted to match the desired finish.
- B. For open-grain woods like Tanguile etc., reduce the prominence of the course grain by applying first quality pastewood filler with consistency reduced for brush application and tinted to match the desired finish. Allow this filler to set sell and remove excess by wiping across grain. Allow overnight drying or as per required by manufacturer. Remove all remaining surplus by wiping the wood.
- C. Allow stains and varnishes to dry for 48 hours between coats and sand lightly between coats with no. 00 sand paper or finer. Clean and dust before applying the next coat.

3.05 CLEANING

Protect the work and adjacent work and materials at all times by a suitable covering or by other methods. Upon completion of the work, remove paint and varnish spots from the floor, glass and finish hardware. Remove all surplus materials, scaffoldings, etc. so as to leave the premises in perfect condition, acceptable to the Owner.

3.06 SUBSTRATE PREPARATION

- A. General Requirements:
 - 1. Surfaces shall be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
 - 2. Remove mildew by washing with a solution of 1 quart liquid household bleach and 3 quarts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Do not add detergents or ammonia to the bleach/water solution.
- B. Aluminum: Remove oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP1, Solvent Cleaning.
- C. Concrete Masonry Units (CMU): Remove loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Mortar must be cured at least 30 days at 75 degrees F. The pH of the surface shall between 6 and 9.
- E. Concrete:
 - 1. Curing: Concrete shall be cured prior to coating application. Curing is defined as concrete placed and aged at a material temperature of at least 75 degrees F for at least 30 days. The pH of the surface must be between 6 and 9.
 - 2. Moisture Content: (Reference ASTM D4263). Concrete must be free of moisture as much as possible (moisture seldom drops below 15 percent

- in concrete). Test for moisture or dampness by taping the 4 edges of an 18 inch by 18 inch plastic sheet (4 mils thick) on the bare surface, sealing all of edges. After a minimum of 16 hours, inspect for moisture, discoloration, or condensation on the concrete or the underside of the plastic. If moisture is present, the source must be located and the cause corrected prior to painting.
3. Temperature: Air, surface and material temperature must be at least 50 degrees F during the application and until the coating is cured.
 4. Contamination: Remove grease, dirt, loose paint, oil, tar, glaze, laitance, efflorescence, loose mortar, and cement by one or more of the following methods:
 5. Brush or Sweep Blast Cleaning: ASTM D4259.
 6. Acid Etching: ASTM D4258.
 7. Power Tool Cleaning or Hand Tool Cleaning: ASTM D4259.
 8. Surface Cleaning: ASTM D4258.
 9. Surface Condition: Hollow areas, bug holes, honeycombs, voids, fins, form marks, protrusions, or rough edges shall be ground or stoned to provide a smooth, continuous surface of suitable texture for proper adhesion of the coating. Imperfections may require filling with a material compatible with finish coatings.
 10. Concrete Treatment: Hardeners, sealers, form release agents, curing compounds, and other concrete treatments must be compatible with finish coatings, or be removed.
- F. Gypsum Board: Surface must be clean and dry, with fastener heads set and spackled. Joints must be taped and covered with a joint compound. Spackled fastener heads and tape joints must be sanded smooth and dust removed prior to painting. Exterior surfaces must be spackled with exterior grade compounds.
- G. Galvanized Metal: Allow to weather a minimum of 6 months prior to coating. Clean per SSPC-SP1 using detergent and water or a degreasing cleaner, then prime as required. When weathering is not possible or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 to remove these treatments.
- H. Plaster: Allow to dry thoroughly for at least 30 days before painting. Space must be ventilated while drying; in cold damp weather, provide heat. Repair damaged areas with an appropriate patching material. Bare plaster must be cured and hard. Treat textured, soft, porous, or powdery plaster with a solution of 1 pint household vinegar to 1 gallon of water. Repeat until the surface is hard. Rinse with clear water and allow to dry.
- I. Previously Coated Surfaces: Remove contamination such as oil, grease, loose paint, mill scale dirt, foreign matter, rust, mold, mildew, mortar, efflorescence, and sealers to assure sound bonding to the tightly adhering old paint. Make glossy surfaces of old paint films clean and dull before repainting. Spot prime any bare areas with an appropriate primer.

3.07 APPLICATION

- A. Dry mil thickness of each coat shall be as scheduled or as recommended by manufacturer. Number of coats scheduled is minimum. Finished application shall be sufficient in total thickness, to completely hide substrate and undercoats.
- B. Where shop coats are specified in other Sections, primer may be omitted except as otherwise specified or recommended by coating manufacturer. Touch up damaged shop coats, using primer compatible with or same as original primer.
- C. Wood Finishing:
 - 1. Prime coat back surfaces of woodwork scheduled to receive opaque finish.

Prime back surfaces of woodwork to receive transparent or semi-transparent finish, using gloss varnish reduced 25 percent with mineral spirits, or other material recommended by manufacturer.

Work fillers into grain before set. Wipe excess from surface.
- D. Apply each coat to uniform finish, without sags, laps, brush marks or other defects. Apply each coat of paint slightly darker than preceding coat. Allow each coat to dry before next coat is applied. Sand lightly between coats if required to achieve specified finish.
- E. Promptly remove spilled, splashed, or spattered coatings.
- F. After coatings have dried, carefully remove masking. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.
- G. Repair damage to other surfaces caused by painting and finishing.
- H. Steel doors and frames – primed. Minimum two coats latex, semi-gloss.
 - 1. At light colors, provide the number of coats necessary to conceal the primer and attain an acceptable finish coat.
 - 2. Immediately prior to application of finish coats to steel, remove all rust and touch up primer. Allow primer to cure prior to application of finish coats.

Read and accepted as part of the Contract:

Bidder/Contractor

3.08 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Field Paint shop primed equipment. Equipment with shop applied enamel coatings do not require field painting unless specified otherwise.
- B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components, and paint separately.
- C. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports. Except where other coating materials are specified, prime as recommended by coating manufacturer for substrate, and finish as specified for adjacent wall and ceiling surfaces.
- D. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to limit of sight line. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
- E. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

3.09 EXTERIOR PAINTING SCHEDULE

- A. As approved by Owner's Representative prior to Contract Award.
- B. As documented in the FINISH SCHEDULE.

3.10 INTERIOR PAINTING SCHEDULE

- A. As approved by Owner's Representative prior to Contract Award.
- B. As documented in the FINISH SCHEDULE.

END OF SECTION 09900

SECTION 09960 HIGH-PERFORMANCE COATINGS

1.00 GENERAL

1.01 SECTION INCLUDES

- A. Elastomeric acrylic coating for concrete.

1.02 REFERENCE SPECIFICATION

- A. Unless specified otherwise, follow all requirements of Part 1 and Part 3 (except painting schedule) of Section 09 91 00.

1.03 SUBMITTALS: Follow Section 01 33 00.

- A. Samples: Provide 3 samples of each coating on each substrate on which it will be installed; 4 x 4 inch, showing proposed color(s) and texture.

1.04 QUALIFICATIONS

- A. Applicator: Company with at least 5 years' experience with coatings similar to those specified.

1.05 QUALITY ASSURANCE: Comply with:

- A. UL fire hazard classifications when tested in accordance with ASTM E84: Flame spread 25; fuel contributed 5; smoke developed 25.

1.06 MOCK-UP:

- A. Provide one mock-up of each finish specified, illustrating coating color, texture and degree of gloss. Locate where directed.
 - 1. Wall and Ceiling Coatings: Each mock-up shall comprise an entire wall of one room.
 - 2. Coatings for Metal: Each mock-up shall comprise a complete door and frame assembly.
- B. Approved mock-ups may remain part of the work.

2.00 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Coatings shall have good flow and application properties; capable of drying or curing free of streaks or sags.
- B. Materials for each application shall be compatible with one another and with other specified materials with which they may come in contact. Bring discrepancies to A/E's or O/R's attention for resolution.
- C. Provide accessory materials as recommended by coating manufacturer, whether or not specified, as required to achieve specified finishes.
- D. Substitutions proposed shall include manufacturer's recommendations regarding surface preparation, primers and rate of coverage, which may differ from systems specified.

2.02 ELASTOMERIC ACRYLIC COATING

- A. Design Standard Manufacturer: Mineral-Life, INC. Substitutions are permitted.
- B. Lime-based paint with Patina Wash and Iron coating.
- C. See Finish Legend for color and material selection.

3.00 EXECUTION

3.01 ELASTOMERIC ACRYLIC COATING

- A. Test and clean substrate in accordance with system manufacturer's recommendations
- B. Repair all spalled areas and voids, remove all loose, soft, friable mortar. Treat, neutralize and remove efflorescence, mold, and mildew prior to coating application.
- C. Apply primer and two coats of elastomeric acrylic coating to system manufacturer's recommended thickness. Backroll for proper distribution.
- D. Finished system is to be pin-hole free.

END OF SECTION 09960

Read and accepted as part of the Contract:

Bidder / Contractor