

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Non-load-bearing steel framing systems for interior partitions, framed soffits, furrings, etc.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of code-compliance certification for studs and tracks.
- B. Evaluation Reports: For firestop tracks, post-installed anchors, and power-actuated fasteners from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association, the Steel Framing Industry Association, or the Steel Stud Manufacturers Association.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 NON-LOAD-BEARING STEEL FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C645 requirements for steel unless otherwise indicated.
 - 2. Protective Coating: ASTM A653/A653M, G60, hot-dip galvanized unless otherwise indicated.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ClarkDietrich.
 - b. Fire Trak Corp.
 - c. MarinoWARE.
 - d. MBA Building Supplies.
 - e. Metal-Lite, Inc.
 - f. MRI Steel Framing, LLC.
 - g. Perfect Wall, Inc.
 - h. Phillips Manufacturing Co.
 - i. SCAFCO Steel Stud Company.
 - j. Steel Construction Systems.
- C. Studs and Tracks: Conforming to ASTM C645.
 - 1. Minimum Base-Steel Thickness: 18 Gauge (0.0403 inch).
 - 2. Depth: As indicated on Drawings.
- D. Slip-Type Head Joints: Where indicated, provide one of the following:

1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch-deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
 2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
 3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- E. Firestop Tracks: Top track manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Steel Thickness: 20 Gauge (0.0359 inch).
- G. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-steel thickness, with minimum 1/2-inch-wide flanges.
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.
- H. Hat-Shaped, Rigid Furring Channels: ASTM C645.
1. Minimum Base-Steel Thickness: 20 Gauge (0.0359 inch).
 2. Depth: 7/8-inch.
- I. Resilient Furring Channels: 1/2-inch deep, steel sheet members designed to reduce sound transmission.
1. Configuration: Asymmetrical or hat shaped.
- J. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges.
1. Depth: 3/4-inch.

2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 20 Gauge (0.0359 inch).
3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch diameter wire, or double strand of 0.048-inch diameter wire.

K. Stud Wall Reinforcing Steel (Tube and Base Plate):

1. Provide heavy gauge steel manufactured product for reinforcing:
 - a. Low walls of metal framing that are 3'-0" to 6'-0" in height.
 - b. Metal framing at door jambs and strikes.
2. Steel base plate metal thickness: 3/8 inch.
3. Steel base plate dimensions: 3 inches x 8 inches with three holes for 1/2-inch diameter bolts.
4. Size of vertical steel tube: 2-inch x 1-inch x 14 Gauge steel tube.
5. Height of vertical steel tube: 34-1/2 inches.
6. Vertical steel tube location on plate: Tube is at one end of base plate to brace low wall and offset on plate to allow conduits to pass by within reinforced low wall.
7. Spacing for 3 ft high low wall: 6 ft. on center.
8. Spacing for 4 ft. high low wall: 4 ft. on center.
9. Spacing for 5 ft. high low wall: 4 ft. on center.
10. Spacing for 6 ft. high low wall: 4 ft. on center.
11. Base plate is secured to concrete floor slab with 1/2-inch diameter steel bolt fasteners with 3-1/2 inch minimum embedment.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide the following:
 1. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8-inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Coordination with Sprayed Fire-Resistive Materials:
 - 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches on center.
 - 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 are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C754.
 - 1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C841 that apply to framing installation.
 - 2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C1063 that apply to framing installation.
 - 3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C844 that apply to framing installation.
 - 4. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.

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

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Single-Layer Application: 16 inches on center unless otherwise indicated.
 - 2. Multilayer Application: 16 inches on center unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks 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 that penetrate 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. 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.
 - 3. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
- B. Related Requirements:
 - 1. Division 07 Section "Thermal Insulation" for insulation and vapor retarders installed in assemblies that incorporate gypsum board.
 - 2. Division 09 Section "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board.
 - 3. Division 09 Section "Interior Painting" for coatings applied to gypsum board surfaces.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

1.4 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 E90 and classified according to ASTM E413 by an independent testing agency.

1.5 DELIVERY, STORAGE AND HANDLING

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

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, 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.

PART 2 - PRODUCTS

2.1 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.
- B. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Gypsum Co.
 - b. BPB America Inc.
 - c. G-P Gypsum.
 - d. Lafarge North America Inc.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple.
 - h. USG Corporation.

2.2 INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
- B. Gypsum Board (Unrated): ASTM C1396/C1396M.
 - 1. Thickness: as indicated on the drawings.
 - 2. Board edges: Tapered.
 - 3. Mold resistance: Back face of board (facing cavity) shall have a coated inorganic glass facing. The board core shall be formulated to be resistant to mold.
- C. Gypsum Board, Type X: ASTM C1396/C1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Board Edges: All edges shall be finish tapered.
 - 3. Mold resistance: Back face of board (facing cavity) shall have a coated inorganic glass facing.
 - 4. Fire resistance: Core material shall be specially formulated for a type X classification as defined in ASTM C36. Board material shall exhibit a 15 flame spread, as manufactured, per ASTM E84.
- D. Gypsum Ceiling Board: ASTM C1396/C1396M.
 - 1. Thickness: As indicated on the drawings.
 - 2. Board Edges: All edges shall be finish tapered.
 - 3. Mold resistance: Back face of board (facing cavity) shall have a coated inorganic glass facing.
 - 4. Fire resistance: Core material shall be specially formulated for a type X classification as defined in ASTM C36. Board material shall exhibit a 15 flame spread, as manufactured, per ASTM E84.
- E. Abuse-Resistant Gypsum Board: ASTM C1396/C1396M gypsum board, tested according to ASTM C1629/C1629M.
 - 1. Core: Thickness as indicated on Drawings.
 - 2. Edges: Tapered.
 - 3. Mold resistance: Back face of board (facing cavity) shall have a coated inorganic glass facing. The board core shall be formulated to be resistant to mold.
 - 4. Fire resistant: Where indicated, the board shall have the same manufactured features as Type 'X' gypsum board specified above.
 - 5. Abuse resistance: Board surface facing occupied space shall have a special heavy-duty paper or inorganic facing specially designed to resist abrasion, scratching, indentation, and puncture. The board core shall be specially formulated with

inorganic binders to achieve a higher bending strength and resistance to soft body impact.

2.3 SPECIALTY GYPSUM BOARD

- A. Glass-Mat Gypsum Sheathing Board: ASTM C1177/C1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
1. Product: Subject to compliance with requirements, provide "DensShield Tile Guard" by G-P Gypsum.
 2. Core: As indicated on the drawings,
 3. Board Edges: Tapered.
 4. Mold and moisture resistance: The board shall have glass mat facings on both sides permanently integrated with the core; on the side facing the room (to receive tile), an acrylic coating or other surface is permanently bonded to the panel to provide adhesion for tile in a high humidity, high moisture environment. The core shall be specially formulated to be water resistant. The board as manufactured shall be highly resistant to mold per ASTM D3273.

2.4 TRIM ACCESSORIES

- A. Interior and Exterior Trim: ASTM C1047.
1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc
 2. Trim Shapes:
 - a. Cornerbead A galvanized steel external corner w/ 1-1/4" legs (USG No. 800 or No. 900 a locations w/ plaster veneer or equivalents).
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound. (USG No. 200-A or 200-B or equivalent) and USG 701A, 701B, 801A and 801B at locations with plaster veneer.
 - c. J-Stop.
 - d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - e. Control Joints w/ grounds (USG ZCJ No. 093 or equivalent).
- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fry Reglet Corp.
 - b. Gordon, Inc.

- c. Pittcon Industries.
- 2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
- 3. Special Trim / Shapes (based on Fry Reglet).
 - a. Drywall Acoustical Trim – 1/2" deep x 3/4" wide drywall acoustical reveal (#DRMAD-50-75).
 - b. Drywall Z Reveal – 5/8" deep x 1/2" wide (#DRMZ -625-50).
 - c. Reveal Molding – 5/8" deep x 5/8" wide (#DRM-625-V-625).
 - d. Drywall F Reveal – 5/8" deep x 3/4" wide (#DRM-625-75).
 - e. Sizes may vary at specific locations; refer to drawings for types, sizes, and locations.
 - f. All special trim provided at ceiling assemblies, shall be White, unless noted otherwise on the drawings. Actual color selected from manufacturer color samples.
 - g. All special trim provided at wall assemblies shall be Medium Bronze. Actual color selected from manufacturer color samples.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
- D. Joint Compound for Exterior Applications:

1. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033- to 0.112-inch-thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Acoustical Sealant: Manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.
- D. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM 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. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. 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 C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Wallboard Type: Non-rated partition assemblies as indicated on Drawings.

2. Type X: Fire-rated partition assemblies as indicated on Drawings.
3. Ceiling Type: Non-rated ceiling assemblies as indicated on Drawings.
4. Abuse-Resistant Type: Partition assemblies in mechanical and high traffic areas as indicated on Drawings.

B. Single-Layer Application:

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

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
1. Fastening Methods: Fasten base layers and face layers separately to supports with screws. (Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.)

3.4 APPLYING EXTERIOR GYPSUM PANELS FOR CEILINGS

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

3.5 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 C840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners, unless otherwise indicated.
 - 2. LC-Bead: Use at exposed panel edges.
 - 3. U-Bead: Use at exposed panel edges.
 - 4. J Stop: Use at concealed locations.
 - 5. Control Joint: Use at locations confirmed in the field with the architect based on the spacing criteria on A701 drawing at each school. At all control joint locations, there shall be separate metal studs located on each side of the joint for attachment of each flange to ensure proper movement relief.
 - 6. Special Trim / Shapes: Refer to drawings for type, size, and location.
- D. Exterior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.
 - 2. LC-Bead: Use at exposed panel edges.

3.6 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 and damaged surface areas.

- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 3: Where indicated on Drawings.
 - 4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 099100 "Painting."
 - 5. Level 5: Where indicated on Drawings.
 - a. Primer and its application to surfaces are specified in Section 099100 "Painting."
- E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
- F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.7 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet, or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 095123 - ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Acoustical tiles for interior ceilings.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For components with factory-applied finishes.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
 - 1. Acoustical Tiles: Set of full-size Samples of each type, color, pattern, and texture.
 - 2. Exposed Moldings and Trim: Set of 6-inch-long samples of each type and color.
 - 3. Seismic Clips: Full size.
- D. Installation Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other:
 - 1. Ceiling heights relative to the floor surface immediately below the ceiling and changes in elevation between finished ceiling planes.
 - 2. Types of ceiling materials, and suspension systems, identified and matching the Architects' product schedule key numbers.
 - 3. Ceiling grid starting points or offset dimensions from finished surfaces.
 - 4. Ceiling details showing changes in materials and ceiling systems, attachment to work by other Contractors, seismic restraint details and components, and other non-typical ceiling conditions.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Ceiling suspension-system members.
 - 2. Structural members to which suspension systems will be attached.
 - 3. Method of attaching hangers to building structure.
 - a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - 4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
 - 5. Size and location of initial access modules for acoustical tile.
 - 6. Items penetrating finished ceiling and ceiling-mounted items including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Access panels.
 - f. Unit Ventilators and other mechanical units.
 - g. Skylights.
 - h. Perimeter moldings.
- B. Product Test Reports: For each acoustical panel ceiling, for tests performed by a qualified testing agency.
- C. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.
- D. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

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

1.7 MAINTENANCE MATERIAL SUBMITTALS

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

1. Acoustical Ceiling Units: Full-size tiles equal to 2 percent of quantity installed.
2. Hold-Down Clips: Equal to 2 percent of quantity installed.

1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to NVLAP for testing indicated.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 1. Build mockup of typical ceiling area as shown on Drawings.
 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspension-system components, and accessories to Project site 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 tiles, 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.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weathertight, 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 tile ceiling installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 for Seismic Design Category C.

- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
 - 2. Smoke-Developed Index: 50 or less.
- C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 ACOUSTICAL TILES, GENERAL

- A. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.
- B. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
- C. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E1264 classifications as designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
 - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E 795.
- D. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
 - 1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL PANELS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products by Armstrong World Industries, Inc., or comparable product by one of the following:
 - 1. CertainTeed Corp.
 - 2. Chicago Metallic Corporation.
 - 3. USG Interiors, Inc.; Subsidiary of USG Corporation.

B. Ceiling Type – C1

1. Style: Optima #3251
2. Color: White
3. LR: Not less than 0.90
4. NRC: Not less than 0.95
5. CAC: Not applicable
6. AC: Not less than 190
7. Edge/Joint Detail: 9/16" Square Tegal
8. Thickness: 1 inch
9. Modular Size: 24 by 24 inches

2.4 METAL SUSPENSION SYSTEM

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Prelude XL 15/16" Exposed Tee system by Armstrong World Industries, Inc., or comparable product by one of the following:
1. CertainTeed Corp.
 2. Chicago Metallic Corporation.
 3. USG Interiors, Inc.; Subsidiary of USG Corporation.
- B. Narrow-Face, Steel-Capped, Double-Web, Fire-Rated Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; pre-painted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation; with prefinished, cold-rolled, 9/16 inch (15 mm) wide metal caps on flanges.
1. Structural Classification: Intermediate-duty system.
 2. Face Design: Flat, flush.
 3. Cap Finish: Painted white.

2.5 METAL EDGE MOLDINGS AND TRIM

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide products indicated on Drawings from Armstrong World Industries or comparable product by one of the following:
1. CertainTeed Corp.
 2. Chicago Metallic Corporation.
 3. USG Interiors, Inc.; Subsidiary of USG Corporation.

- C. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements and the following:
1. Aluminum Alloy: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of aluminum extrusions complying with ASTM B 221 (ASTM B 221M) for Alloy and Temper 6063-T5.
 2. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.
 3. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils (0.04 mm). Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

2.6 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
- B. Wire Hangers, Braces, and Ties: Provide wires as follows:
1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
 2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.135-inch diameter wire.
- C. Seismic Clips: Manufacturer's standard seismic clips designed to secure acoustical tiles in-place during a seismic event.

2.7 ACOUSTICAL SEALANT

- A. Acoustical Sealant: As specified in Section 079200 "Joint Sealants."

2.8 MISCELLANEOUS MATERIALS

- A. Acoustical Tile Adhesive: Type recommended in writing by acoustical tile manufacturer, bearing UL label for Class 0-25 flame spread.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

- A. Install suspended acoustical tile ceilings according to ASTM C636/C636M, seismic design requirements, and manufacturer's written instructions.
 - 1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and

- that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 6. Do not attach hangers to steel deck tabs.
 7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 8. Space hangers not more than 48 inches on center along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical tiles.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Arrange directionally patterned acoustical tiles as follows:
1. As indicated on reflected ceiling plans.
- G. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
 2. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
 4. Install hold-down clips in toilets, in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.

3.4 ERECTION TOLERANCES

- A. Suspended Ceilings: Install main and cross-runners level to a tolerance of 1/8-inch in 12 feet, non-cumulative.
- B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8-inch in 12 feet, non-cumulative.

3.5 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.

3.6 ADJUSTING

- A. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095123

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SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Thermoset-rubber base.
 - 2. Rubber molding accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches (300 mm) long.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches (300 mm) long.
- E. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Johnsonite Rubber Base.

- B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
 - 1. Style and Location:
 - a. Style A, Straight.
 - b. Style B, Cove.
- C. Thickness: 0.125 inch (3.2 mm).
- D. Height: 4 inch (101.6 mm).
- E. Lengths: Cut lengths 48 inches (1219 mm) long or coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.
- H. Colors: Refer to Material Schedule on drawings.

2.2 RUBBER MOLDING ACCESSORY

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Johnsonite.
- B. Description: Rubber nosing for carpet, nosing for resilient floor covering, reducer strip for resilient floor covering, joiner for tile and carpet, transition strips.
- C. Profile and Dimensions: As indicated.
- D. Colors and Patterns: Refer to Material Schedule on drawings.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Accessories: Prepare horizontal surfaces according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
 - 4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m), and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

- D. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from surfaces.
 2. Sweep and vacuum horizontal surfaces thoroughly.
 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Product Data: For adhesives, sealants and chemical-bonding compounds, documentation including printed statement of VOC content.
- B. Shop Drawings: For each type of resilient floor tile.
 - 1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 2. Show details of special patterns.
- C. Samples for Initial Selection: For each type of floor tile indicated.
- D. Samples for Verification: Full-size units of each color and pattern of floor tile required.
- E. Product Schedule: For floor tile.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 VINYL COMPOSITION FLOOR TILE (VCT)

- A. Basis of Design: Provide products indicated on the drawings manufactured by Armstrong World Industries. Subject to compliance with requirements, and subject to color and other aesthetic approval at the sole discretion of the Architect, available manufacturers offering products that may be incorporated into the work include, but are not limited to the following:
 - 1. American Biltrite.
 - 2. Congoleum Corporation.
 - 3. Johnsonite; a Tarkett company.
- B. Tile Standard: ASTM F1066, Class 2, through-pattern tile.
- C. Wearing Surface: Smooth.
- D. Thickness: 0.125 inch.
- E. Size: 12 inches by 12 inches.
- F. Colors and Patterns: As selected by Architect from manufacturer's full range of colors.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
 - 1. Adhesives shall comply with the following limits for VOC content:
 - a. Vinyl Composition Tile Adhesives: 50 g/L or less.

2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F710.
 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles square with room axis.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain direction matching existing floor tile layout.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from surfaces.
 2. Sweep and vacuum surfaces thoroughly.
 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
1. Apply one (1) coat.
- E. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 099100 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on interior and exterior substrates.

1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.
- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.
- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Indicate VOC content.

- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: Five percent (5%), but not less than 1 gallon of each material and color applied.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

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

1.8 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to products listed in the Exterior and Interior Painting Schedule for the paint category indicated.
 - 1. Basis of Design: The Sherwin-Williams Company.

2.2 PAINT, GENERAL

- A. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for exterior and interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base:
 - 1. Flat Paints and Coatings: 50 g/L.
 - 2. Non-flat Paints and Coatings: 150 g/L.

3. Dry-Fog Coatings: 400 g/L.
4. Primers, Sealers, and Undercoaters: 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Floor Coatings: 1 00 g/L.
9. Shellacs, Clear: 730 g/L.
10. Shellacs, Pigmented: 550 g/L.

C. Colors: Match Architect's samples unless otherwise indicated in a color schedule.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Concrete: 12 percent.
 2. Fiber-Cement Board: 12 percent.
 3. Masonry (Clay and CMUs): 12 percent.

4. Wood: 15 percent.
 5. Gypsum Board: 12 percent.
 6. Plaster: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

1. SSPC-SP 2.
 2. SSPC-SP 3.
 3. SSPC-SP 7/NACE No. 4.
 4. SSPC-SP 11.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Wood Substrates:
1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 2. Sand surfaces that will be exposed to view, and dust off.
 3. Prime edges, ends, faces, undersides, and backsides of wood.
 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
1. Use applicators and techniques suited for paint and substrate indicated.
 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
 6. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but provide sufficient difference in shade of undercoats to distinguish each separate coat.

- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

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

3.5 CLEANING AND PROTECTION

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

3.6 INTERIOR PAINTING SCHEDULE

- A. CMU – Concrete Masonry Units.
 - 1. Semi-Gloss Finish.
 - a. Primer: PrepRite® Block Filler, B25W25.
 - b. 1st Coat: ProMar® 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 Series.

- c. 2nd Coat: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 Series.

B. Gypsum Board – Partitions

1. Egg-Shell Finish.

- a. Primer: ProMar 200 Zero VOC Latex Primer, B28W2600.
- b. 1st Coat: ProMar 200 Zero VOC Interior Latex Egg-Shell, B20-2600 Series.
- c. 2nd Coat: ProMar 200 Zero VOC Interior Latex Egg-Shell, B20-2600 Series.

C. Gypsum Board – Ceilings and Soffits

1. Flat Finish.

- a. Primer: ProMar 200 Zero VOC Latex Primer, B28W2600.
- b. 1st Coat: ProMar 200 Zero VOC Interior Latex Flat, B30-2600 Series.
- c. 2nd Coat: ProMar 200 Zero VOC Interior Latex Flat, B30-2600 Series.

D. Ferrous Metal – Doors, Frames and Miscellaneous Metals

1. Semi-Gloss Finish.

- a. Primer: Pro Industrial™ ProCryl® Universal Primer, B66-310 Series.
- b. 1st Coat: Pro Industrial Acrylic Semi-Gloss, B66-650 Series.
- c. 2nd Coat: Pro Industrial Acrylic Semi-Gloss, B66-650 Series.

E. Non-Ferrous Metal – Galvanized/Aluminum Metal Surfaces

1. Semi-Gloss Finish.

- a. Primer: Pro Industrial ProCryl Universal Primer, B66-310 Series
- b. 1st Coat: Pro Industrial Acrylic Semi-Gloss, B66-650 Series.
- c. 2nd Coat: Pro Industrial Acrylic Semi-Gloss, B66-650 Series.

END OF SECTION 099123

SECTION 099300 – STAINING AND TRANSPARENT FINISHING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Masterline Water-Based Polyurethane Finish. (Water Based Finish)
- B. Masterline Polyurethane Finish 550 VOC. (Oil Modified Finish)
- C. DuraSeal DuraClear 1K Polyurethane Finish. (Clear Water Based Finish)

1.2 RELATED SECTIONS

- A. Section 064023 – Interior Architectural Woodwork and Finish Carpentry.

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM D523 - Standard Test Method for Specular Gloss.
 - 2. ASTM D1640 - Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings.
 - 3. ASTM D2369 - Standard Test Method for Volatile Content of Coatings.
 - 4. ASTM D3828 - Standard Test Methods for Flash Point by Small Scale Closed Cup Tester.
 - 5. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

1.4 SUBMITTALS

- A. Submit under provisions of Section 013300 - Administrative Requirements.
- B. Product Data:
 - 1. Manufacturer's data sheets on each product to be used.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Typical installation methods.
- C. Verification Samples: Two (2) representative units of each type, size, pattern, and color.
- D. Shop Drawings: Include details of materials, construction, and finish.

Include relationship with adjacent construction.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
- C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

1.6 PRE-INSTALLATION CONFERENCE

- A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- B. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 WARRANTY

- A. Manufacturer's standard limited warranty unless indicated otherwise.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Sherwin-Williams, which is located at: 101 Prospect Ave.; Cleveland, OH 44115; Toll Free Tel: 800-4-SHERWIN (474-3794); Tel: 216-566-2000; Email: [request info \(specifications@sherwin.com\)](mailto:requestinfo(specifications@sherwin.com))
- B. Requests for substitutions will be considered in accordance with provisions of Section 016000 - Product Requirements.

2.2 PRODUCT: MASTERLINE WATER-BASED POLYURETHANE FINISH (WATER BASED FINISH)

- A. Basis of Design: MASTERLINE Water-Based Polyurethane Finish. A single-component, durable wood floor finish for residential, commercial and Sports Floor uses. A less than 275 VOC water-based formulation allows for fast drying finish. Outstanding flow and leveling.
 - 1. Luster: Gloss: 90 minimum according to ASTM D523.
- B. Product Properties:
 - 1. Dry Time and Cure: Based on thin coat application, good ventilation, an average temperature of 77 degrees F and 50 percent relative humidity. Lower temperature, higher humidity, lack of air movement or excessive application extends dry time.
 - a. Recoating: Two (2) hours according to ASTM D1640.
 - b. Hot coat window is 2 to 8 hours.
 - c. Allowing Light Traffic: 24 hours after final coat.
 - 2. Coverage: Approx. 500 to 600 sq ft per gallon (12.3 to 14.7 sq m per Liter).
 - 3. Dry Film Thickness: 0.6 mil per coat.
 - 4. Number of Coats: 1-2.
 - 5. Odor: Mild Amine.
 - 6. Clean-Up: Clean application tools with warm water immediately after use.
 - 7. Storage: Store at room temperature. Keep container tightly closed.
 - a. If stored at high temperature, cool to room temperature before use.
 - b. Keep from freezing. Product is unusable if frozen.

C. Physical Properties:

1. Resin Type: Urethane.
2. Density: 8.25 to 8.65 lbs per gallon (0.99 to 1.04 kg per Liter)
3. Solvent: Water, 1-methyl-2-Pyrrolidone, Glycol Ether.
4. Viscosity: 90 to 130 cps.
5. Solids: 29.0 to 31 percent according to ASTM D2369
6. VOC: 2.29 lbs per gallon (275 grams per Liter) maximum according to ASTM D3960.
7. pH: 7.00 to 9.00
8. Flash Point: Greater than 212 degrees F (100 degrees C) SETAFLASH according to ASTM D3828.

2.3 PRODUCT: MASTERLINE POLYURETHANE FINISH 550 VOC (OIL MODIFIED FINISH)

- A. Basis of Design: MASTERLINE 550 VOC Polyurethane., A durable oil modified finish suitable for large volume applications such as Sports Floors, meeting halls, multiple-unit dwellings, and other commercial uses. The product will have a slight ambering or darkening effect when applied over light-colored surfaces.

1. Luster: Gloss.

B. Product Properties:

1. Dry Time and Cure:
 - a. Recoating: Eight (8) hours.
 - b. Allowing Light Traffic: Overnight.
2. Coverage: Approx. 500 to 600 sq ft per gallon (12.3 to 14.7 sq m per Liter).
3. Clean-Up: Clean applicators with mineral spirits or paint thinner.
4. Storage: Store at room temperature. Keep container tightly closed.

C. Physical Properties:

1. Resin Type: Oil modified urethane.
2. Density: 7.30 lbs per gallon (0.87 kg per L).
3. Solvent: Mineral spirits.

4. Viscosity: 200 cps.
5. Solids: 44.0 percent.
6. VOC: Less than (4.59 lbs per Gallon) 550 grams per liter.
7. Flash Point: 105 degree F (40.56 degrees C).

D. Health and Safety HMIS Rating:

1. Health: 2.
2. Flammability: 2.
3. Reactivity: 0.

2.4 PRODUCT: DURASEAL DURACLEAR 1K POLYURETHANE FINISH

A. Basis of Design: DuraSeal DuraClear 1K Polyurethane Finish (Clear Water Based Finish). A single-component, durable clear wood floor finish for residential, commercial and Sports Floor uses. A less than 275 VOC water-based formulation allows for fast drying finish. Cleans up with warm water.

1. Luster: Gloss: 90 minimum according to ASTM D523.

B. Product Properties:

1. Number of Coats; 1-2.
2. Dry Time: Based on thin coats, an average temperature of 77 degrees F and 50 percent relative humidity.
 - a. Re-Coat: Within 2 hours. Meets ASTM D1640.
 - b. Hot coat window 2 to 24 hours
 - c. Allowing Light Traffic: 24 hours after final coat.
3. Dry Film Thickness: 0.6 mils (0.15 mm) per coat.
4. Coverage: Approx. 500 to 600 sq ft per gallon (12.3 to 14.7 sq m per Liter)
5. Odor: Mild Amine.
6. Clean-Up: Clean application tools with warm water immediately after use.
7. Storage: Store at room temperature. Keep container tightly closed.
 - a. If stored at high temperature, cool to room temperature before use.
 - b. Keep from freezing. Product is unusable if frozen.

C. Physical Properties:

1. Resin Type: Urethane.
2. Solids: 29 to 33 percent according to ASTM D2369.
3. Solvent: Water, Tripropylene glycol n-butyl ether.
4. Product Weight: 8.65 to 8.76 lbs per gallon (1.04 to 1.05 kg per L).
5. Viscosity: 90 to 155 cps.
6. VOC: 1.04 lbs [er ga(125 grams per Liter) or less according to ASTM D3960
7. pH: 7.0 to 9.0.
8. Flash Point: Greater than 212 degrees F (100 degrees C) SETAFLASH according to ASTM D3828.

PART 3 – EXECUTION (BUFF AND RE-COAT)

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly constructed and prepared.
 1. Previously Finished Floors: Do not apply over floors previously finished with shellac, lacquer, wax, stains containing stearates, or finishes in very poor condition in need of complete removal.
- B. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by DuraSeal for achieving the best result for the substrate under the project conditions.
 1. Buff the floor as to not show swirl marks on existing finish. DuraSeal recommends 150 to 180 grit pads.
 2. Vacuum and tack floor accordingly based on DuraSeal Product Data Page.
 - a. Masterline Water-Based Polyurethane (Water Based Finish): Use water to tack and allow to dry thoroughly.

- b. Masterline Polyurethane Finish 550 VOC (Oil Modified Finish):
Use virgin mineral spirits to tack floor and allow to dry thoroughly.
- c. DuraSeal DuraClear 1K Polyurethane Finish (Clear Water Based Finish): Use water to tack and allow to dry thoroughly.

3.3 APPLICATION

- A. Masterline Water-Based Polyurethane Finish (Water Based Finish):
 - 1. Apply at 500 to 600 square feet per gallon with preferred application method.
 - 2. If applying one coat allow to dry minimum overnight.
 - 3. If a second coat is desired, apply second within hot coat window (2 to 8 hours) or buff if over 8 hours and recoat.
 - a. Vacuum and tack the floor after buffing process prior to applying second coat.
- B. Masterline Polyurethane Finish 550 VOC (Oil Modified):
 - 1. Apply at 500 to 600 square feet per gallon with preferred application method.
 - 2. If applying one coat allow to dry minimum overnight.
 - 3. If a second coat is desired, repeat the buffing process outlined in Article 3.2, Paragraph B-1 and apply second coat.
 - a. Vacuum and tack the floor after buffing process prior to applying second coat.
- C. DuraSeal DuraClear 1K Polyurethane Finish (Clear Water Based Finish):
 - 1. Apply at 500 to 600 square feet per gallon with preferred application method.
 - 2. If applying one coat allow to dry minimum overnight.
 - 3. If a second coat is desired, apply second within hot coat window (2 to 24 hours) or buff if over 24 hours and recoat.
 - a. Vacuum and tack the floor after buffing process prior to applying second coat.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

3.5 CLEANING AND PROTECTION

- A. Clean products in accordance with the manufacturer's recommendations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 099300