

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes non-structural metal framing members for the following applications:
 - 1. Steel framing systems (e.g., supports for partition walls, infill framing, framed soffits, furring, etc.).
 - 2. Interior suspension systems (e.g., supports for ceilings, suspended soffits, etc.).
- B. Related Sections include the following:
 - 1. Division 9 Section "Gypsum Board" for wall cladding.

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

2.1 NON-STRUCTURAL METAL FRAMING

- 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.
 - 2. Protective Coating: Manufacturer's standard corrosion-resistant zinc coating, but not less than ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized.

2.2 SUSPENSION SYSTEM COMPONENTS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by an independent testing agency.
 - 2. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by an independent testing agency.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch (4.12-mm) diameter.
- D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch (1.37 mm) and minimum 1/2-inch- (12.7-mm-) wide flanges.
 - 1. Depth: 1-1/2 inches (38 mm).
- E. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges, 3/4 inch (19.1 mm) deep.
 - 2. Steel Studs: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.0179 inch (0.45 mm).
 - b. Depth: As indicated on Drawings.
 - 3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22.2 mm) deep.
 - a. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm).
- F. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation.
 - c. Drywall Furring System.
 - d. USG Corporation; Drywall Suspension System.

2.3 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Steel Studs and Runners: ASTM C 645.
- B. Minimum Base Metal Thickness: 25 gage in all locations except 20 gage in locations where the following conditions exist or the following materials are used:
- 1) Where the floor to floor height (limiting height) exceeds the allowable deflection of 1/240 for 25 gage studs.
 - 2) At stair shafts, elevator hoistways, and other vertical shafts.
 - 3) At partitions to receive stone cladding, ceramic tile, cementitious backer board, abuse-resistant gypsum board, plywood, wood panels, projection screens, marker or chalkboards, veneer plaster, gypsum plaster or portland cement plaster.
 - 4) At partitions to receive cabinets, countertops, shelving, other wall supported millwork, casework, furniture items, wall-hung plumbing fixtures without chair carriers and equipment either furnished and installed by the Contractor, furnished and installed by the Owner or furnished by the Owner and installed by the Contractor.
 - 5) At framing for door frames; refer to Part 3, Installing Framed Assemblies.
 - 6) At cantilevered furring and miscellaneous framing supports.
 - 7) Note: All of the above mentioned materials may not be used on this project.
- C. Depth of Studs: As indicated on the Drawings.
- D. Slip-Type Head Joints: Where indicated in Part 3 EXECUTION, provide one of the following:
1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (50.8-mm-) 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 (305 mm) of the top of studs to provide lateral bracing.
- E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Metal Thickness: 0.0179 inch (0.45 mm).
- F. Cold-Rolled Channel Bridging: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.
1. Depth: 1-1/2 inches (38.1 mm).
 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38.1 by 38.1 mm), 0.068-inch- (1.73-mm-) thick, galvanized steel.
- G. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm).
 2. Depth: 7/8 inch (22.2 mm) or as indicated on the Drawings.
- H. Cold-Rolled Furring Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.
1. Depth: 3/4 inch (19.1 mm) or as indicated on the Drawings.

2. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
- I. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (31.8 mm), wall attachment flange of 7/8 inch (22.2 mm), minimum bare-metal thickness of 0.0179 inch (0.45 mm), and depth required to fit insulation thickness indicated.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power and other properties required to fasten steel members to substrates.

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

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 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.

3.4 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 forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ductwork, running parallel or perpendicular to hangers, and other construction within "attic" space, 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. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - 5. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. 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.
- E. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.5 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.
- C. Where width of ductwork, running parallel or perpendicular to partitions, and other construction within "attic" space, that interfere with locations to support standard head tracks, install supplemental members in the form of trapezes or equivalent support devices to maintain structural and all other requirements of an unobstructed partition.

- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
1. Slip-Type Head Joints: Where framing extends to overhead structural supports, floor or roof decks, 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. Frame door openings to comply with GA-600 and with gypsum board manufacturer's written recommendations.
 - b. For standard doors up to 3'-0" wide weighing not more than 100 pounds, use minimum 25 gage steel studs and runners to frame opening.
 - c. For doors 2'-8" to 4'-0" wide weighing more than 100 pounds and less than 200 pounds, use 20 gage studs and runners to frame opening.
 - d. For doors up to 4'-0" wide weighing more than 200 pounds and less than 300 pounds, use two 20 gage studs and runners to frame opening.
 - e. For doors over 4'-0" wide, double doors and doors weighing more than 300 pounds, use two 18 gage studs and runners to frame openings.
 3. Other Framed Openings: Frame openings, other than door openings, the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
- E. Direct Furring:
1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION

SECTION 09 24 00

PORTLAND CEMENT PLASTERING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Metal framing and furring.
 - 2. Metal lath and accessories.
 - 3. Portland cement plaster.

- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 6 Section "Sheathing" for back-up material.
 - 2. Division 7 Section "Flexible Flashing" for back-up material.
 - 3. Division 9 Section "Exterior Painting" for finish coating on plaster.

1.2 SUBMITTALS

- A. Product Data for each product specified.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cementitious materials to Project site in original packages, containers, or bundles, labeled with manufacturer's name, product brand name, and lot number.

- B. Store materials inside, under cover, and dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes.

1.4 PROJECT CONDITIONS

- A. Environmental Requirements, General: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after plaster application.

- B. Cold-Weather Requirements: Provide heat and protection, temporary or permanent, as required to protect each coat of plaster from freezing for at least 24 hours after application. Distribute heat uniformly to prevent concentration of heat on plaster near heat sources; provide deflection or protective screens.

- C. Warm-Weather Requirements: Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial. Apply and cure plaster as required by climatic and job conditions to prevent dry out during cure period. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.

- D. Exterior Plaster Work: Do not apply plaster when ambient temperature is below 40 deg F (4 deg C).
- E. Protect contiguous work from soiling and moisture deterioration caused by plastering. Provide temporary covering and other provisions necessary to minimize harmful spattering of plaster on other work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Metal Framing and Supports:
 - a. Alabama Metal Industries Corp. (AMICO).
 - b. Clark Steel Framing, Inc.
 - c. Dale//Incor Industries, Inc.
 - d. National Gypsum Co.
 - e. Unimast, Inc.
 - 2. Expanded-Metal Lath:
 - a. Alabama Metal Industries Corp. (AMICO) as a basis of design..
 - b. Dale//Incor Industries, Inc., as a basis of design.
 - c. National Gypsum Co.
 - d. United States Gypsum Co.
 - 3. Metal Accessories:
 - a. Alabama Metal Industries Corp. (AMICO).
 - b. Dale//Incor Industries, Inc.
 - c. Fry Reglet Corporation.
 - d. Gordon, Inc.
 - e. Metalex (Keene Products).
 - f. National Gypsum Co.
 - g. Unimast, Inc.
 - h. United States Gypsum Co.
 - 4. Plaster:
 - a. California Stucco Products Corp.
 - b. Florida Stucco Corp.
 - c. Highland Stucco.
 - d. IPA Systems, Inc.
 - e. United States Gypsum Co.

2.2 LATH FOR VERTICAL PLASTER

- A. Expanded-Metal Lath: Comply with ASTM C 847 for material, type, configuration, and other characteristics indicated below.
 - 1. Material: Fabricate expanded-metal lath from sheet metal conforming to the following:
 - a. Galvanized Steel: Structural-quality, zinc-coated (galvanized) steel sheet complying with ASTM A 653, G60 (ASTM A 653M, Z180) minimum coating designation, unless otherwise indicated.
 - 2. Diamond-Mesh Lath: Comply with the following requirements:
 - a. Configuration: Self-furring.
 - 1) Weight: 3.4 lb/sq. yd. (1.8 kg/sq. m).

2.3 ACCESSORIES

- A. General: Comply with material provisions of ASTM C 1063 and the requirements indicated below; coordinate depth of accessories with thicknesses and number of plaster coats required.
 - 1. Zinc-Alloy Components: ASTM B 69, 99 percent pure zinc.
- B. Metal Corner Reinforcement: Expanded, large-mesh, diamond-metal lath fabricated from zinc-alloy or welded-wire mesh fabricated from 0.0475-inch- (1.2-mm-) diameter, zinc-coated (galvanized) wire and specially formed to reinforce external corners of portland cement plaster on exterior exposures while allowing full plaster encasement.
- C. Cornerbeads: Small nose cornerbeads fabricated from the following metal, with expanded flanges of large-mesh diamond-metal lath allowing full plaster encasement.
 - 1. Zinc Alloy: Minimum 0.0207 inch (0.53 mm) thick.
- D. Casing Beads: Square-edged style, with expanded flanges of the following material:
 - 1. Zinc Alloy: Minimum 0.0207 inch (0.53 mm) thick.
- E. Lath Attachment Devices: Material and type required by ASTM C 1063 for installations indicated.

2.4 PLASTER MATERIALS

- A. Base-Coat Cements: Type as indicated below:
 - 1. Portland cement, ASTM C 150, Type I.

- B. Job-Mixed Finish-Coat Cement: Material and color as indicated below:
 - 1. Portland cement, ASTM C 150, Type I.
- C. Cement Color: Gray.
- D. Factory-Prepared Finish Coat: Manufacturer's standard factory-packaged blend of portland cement, ASTM C 150, Type I or III; hydrated lime, Type S, ASTM C 206 or ASTM C 207; aggregate, ASTM C 897; and compatible with base coat and finish texture indicated; in color indicated below:
 - 1. White.
- E. Sand Aggregate for Base Coats: ASTM C 897.
- F. Aggregate for Finish Coats: ASTM C 897 system and as indicated below:
 - 1. Manufactured or natural sand, white in color.

2.5 MISCELLANEOUS MATERIALS

- A. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in portland cement plaster.
- B. Water for Mixing and Finishing Plaster: Potable.
- C. Bonding Agent: ASTM C 932.
- D. Line Wire: 0.0475-inch- (1.2-mm-) diameter, zinc-coated (galvanized), soft, annealed steel wire.
- E. Steel drill screws complying with ASTM C 954 for fastening metal lath to steel members 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

2.6 PLASTER MIXES AND COMPOSITIONS

- A. General: Comply with ASTM C 926 for base- and finish-coat mixes as applicable to plaster bases, materials, and other requirements indicated.
- B. Base-Coat Mixes and Compositions: Proportion materials for respective base coats in parts by volume per sum of cementitious materials for aggregates to comply with the following requirements for each method of application and plaster base indicated. Adjust mix proportions below within limits specified to attain workability.
- C. Fiber Content: Add fiber to following mixes after ingredients have mixed at least 2 minutes. Comply with fiber manufacturer's written instructions but do not exceed 1 lb/cu. ft. (16 kg/cu. m) of cementitious materials. Reduce aggregate quantities accordingly to maintain workability.
- D. Three-Coat Work over Metal Lath: Base-coat proportions as indicated below:

1. Scratch Coat: 1 part portland cement, 0 to 3/4 parts lime, 2-1/2 to 4 parts aggregate.
 2. Brown Coat: 1 part portland cement, 0 to 3/4 parts lime, 3 to 5 parts aggregate.
- E. Job-Mixed Finish Coats: Proportion materials for finish coats in parts by volume for cementitious materials and parts by volume per sum of cementitious materials to comply with the following requirements:
1. Proportions using sand aggregates as indicated below:
 - a. 1 part portland cement, 3/4 to 1-1/2 parts lime, 3 parts sand.

2.7 MIXING

- A. Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Applicator present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.
1. Begin vertical lathing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.
 - a. Coordinate installation of flexible flashing at heads and sills which penetrate plaster and extend up behind sheathing.
 - b. Ensure Architect has inspected and approved sheathing and flashing.

3.2 INSTALLATION OF LATH AND FURRING, GENERAL

- A. Standards: Comply with ML/SFA 920, "Guide Specifications for Metal Lathing and Furring," and with requirements of ASTM C 1063.
- B. Install supplementary framing, blocking, and bracing at terminations in work and for support of fixtures, equipment services, heavy trim, grab bars, handrails, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable written instructions of lath and furring manufacturer.
- C. Isolation: Where lathing and metal support system abuts building structure horizontally and where partition or wall abuts overhead structure, sufficiently isolate from structural movement to prevent transfer of loading from building structure. Install slip- or cushion-type joints to absorb deflections but maintain lateral support.
1. Frame both sides of control joints independently and do not bridge joints with furring and lathing or accessories.

- D. Install additional framing, furring, runners, lath, and beads, as required to form openings and frames for other work as indicated. Coordinate support system for proper support of framed work that is not indicated to be supported independently of metal furring and lathing system.

3.3 LATHING

- A. Install metal lath where plaster base coats are required. Provide appropriate type, configuration, and weight of metal lath selected from materials indicated under Part 2 Products that comply with referenced ML/SFA specifications and ASTM lathing installation standards.

3.4 INSTALLATION OF PLASTERING ACCESSORIES

- A. General: Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joints and in alignment. Attach accessories securely to plaster bases to hold accessories in place and in alignment during plastering. Install accessories of type indicated at following locations:

1. Terminations of Plaster: Install casing beads, unless otherwise indicated.

3.5 PLASTER APPLICATION

- A. Plaster Application Standard: Apply plaster materials, composition, and mixes to comply with ASTM C 926.
- B. Do not use materials that are frozen, caked, lumpy, dirty, or contaminated by foreign materials.
- C. Do not use excessive water in mixing and applying plaster materials.
- D. Flat Surface Tolerances: Do not deviate more than plus or minus 1/8 inch in 10 feet (3 mm in 3 m) from a true plane in finished plaster surfaces, as measured by a 10-foot (3-m) straightedge placed at any location on surface.
- E. Sequence plaster application with installation and protection of other work so that neither will be damaged by installation of other.
- F. Corners: Make internal corners and angles square; finish external corners flush with cornerbeads on interior work, square and true with plaster faces on exterior work.
- G. Number of Coats: Apply plaster of composition indicated, to comply with the following requirements:
 1. Vertical Application: Three Coats of 7/8 total thickness over the following plaster base:
 - a. Metal lath.

- H. Finish Coats: Apply finish coats to comply with the following requirements:
 - 1. Smooth Finish: Apply finish coat to a minimum thickness of 1/8 inch (3 mm) to completely cover base coat, uniformly floated to a true even plane with smooth finish to simulate, when painted, adjacent stone wall panels.
- I. Moist-cure plaster base and finish coats to comply with ASTM C 926, including written instructions for time between coats and curing in "Annex A2 Design Considerations." Uniform and consistent curing processes must be maintained throughout the entire plaster application.

3.6 CLEANING AND PROTECTING

- A. Remove temporary covering and other provisions made to minimize spattering of plaster on other work. Promptly remove plaster from surfaces not to be plastered. Repair surfaces stained, marred or otherwise damaged during plastering work. When plastering work is completed, remove unused materials, containers, equipment, and plaster debris.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer. Ensure plaster work is without damage or deterioration at the time of completion.

END OF SECTION

SECTION 09 26 13

GYPSUM VENEER PLASTERING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Gypsum veneer plaster and gypsum base for veneer plaster.
- B. Related Sections include the following:
 - 1. Division 1 Section "Alternates" for description of work under this Section affected by alternates.
 - 2. Division 09 Section "Non-Structural Metal Framing" for non-load-bearing steel framing and other components of gypsum veneer plaster assemblies.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations, fabrication, and installation of control joints, and reveals and trim; include plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch (300-mm) length for each trim accessory.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain gypsum veneer plaster products, including gypsum base for veneer plaster, joint reinforcing tape, and embedding material, from a single manufacturer.
- B. Mockups: Provide a full-thickness finish mockup for each type and finish of gypsum veneer plaster and substrate to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Provide mockups of partitions in sizes of at least 32 square feet.
 - 2. Apply gypsum veneer plaster, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

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

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 843 requirements or gypsum veneer plaster manufacturer's written recommendations, whichever are more stringent.
- B. Room Temperatures: Maintain not less than 55 deg F (13 deg C) or more than 80 deg F (27 deg C) for 7 days before application of gypsum base and gypsum veneer plaster, continuously during application, and after application until veneer plaster is dry.
- C. Avoid conditions that result in gypsum veneer plaster drying too rapidly.
 - 1. Distribute heat evenly; prevent concentrated or uneven heat on veneer plaster.
 - 2. Maintain relative humidity levels, for prevailing ambient temperature, that produce normal drying conditions.
 - 3. Ventilate building spaces in a manner that prevents drafts of air from contacting surfaces during veneer plaster application until it is dry.
- D. Do not install panels that are wet, moisture damaged, or mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 GYPSUM VENEER PLASTER MATERIALS

- A. Two-Component Gypsum Veneer Plaster: ASTM C 587, with separate formulations; one for base-coat and one for finish-coat application over substrates.
 - 1. Basis of Design Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. USG Corporation:
 - 1) Base Coat: Diamond Brand Veneer Basecoat Plaster.
 - 2) Smooth Finish Coat: Diamond Brand Interior Finish Plaster.

3) Total Thickness: 3/32 inch thick.

2.2 PANEL PRODUCTS

- A. Basis of Design for Gypsum Base: 5/8 Inch Imperial Brand Gypsum Base; USG Corporation.
- B. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
- C. Gypsum Base for Veneer Plaster: ASTM C 588/C 588M.

2.3 TRIM ACCESSORIES

- A. Standard Trim: ASTM C 1047, provided or approved by manufacturer for use in gypsum veneer plaster applications indicated.
 - 1. Material: Galvanized
 - 2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. L-Bead: L-shaped; exposed long flange receives joint compound.
 - d. Control joints.

2.4 JOINT REINFORCING MATERIALS

- A. General: Comply with joint strength requirements in ASTM C 587 and with gypsum veneer plaster manufacturer's written recommendations for each application indicated.
- B. Joint Tape:
 - 1. Gypsum Base for Veneer Plaster: As recommended by gypsum veneer plaster manufacturer for applications indicated
- C. Embedding Material for Joint Tape:
 - 1. Gypsum Base for Veneer Plaster: As recommended by gypsum veneer plaster manufacturer for use with joint-tape material and gypsum veneer plaster applications indicated.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced product standards and manufacturer's written recommendations.
- B. Bonding Agent: ASTM C 631, polyvinyl acetate.

- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
- D. Patching Mortar: Dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

2.6 GYPSUM VENEER PLASTER MIXES

- A. Mechanically mix gypsum veneer plaster materials to comply with ASTM C 843 and with gypsum veneer plaster manufacturer's written recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.
- C. Verify that mortar joints are struck flush.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLING PANELS, GENERAL

- A. Gypsum Base for Veneer Plaster: Apply according to ASTM C 844 unless manufacturer's written recommendations are more stringent.
 - 1. Do not allow gypsum base to degrade from exposure to sunlight as evidenced by fading of paper facing.
 - 2. Erection Tolerance: No more than 1/16-inch (1.6-mm) offsets between planes of gypsum base panels, and 1/8 inch in 8 feet (3 mm in 2.4 m) noncumulative, for level, plumb, warp, and bow.
- B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.6 mm) of open space between panels. Do not force into place.
- C. Locate edge and end joints over supports. 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. Attach panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

- E. Attach panels to framing provided at openings and cutouts.
- F. Form control joints with space between edges of adjoining panels.
- G. Cover both sides of steel stud partition framing with panels in concealed spaces, including above ceilings, except in internally braced chases.
 - 1. Unless concealed application is indicated coverage may be accomplished with scraps of not less than 8 sq. ft. (0.74 sq. m) in area.
 - 2. Fit panels around ducts, pipes, and conduits.
- H. Fastener Spacing: Comply with ASTM C 844, manufacturer's written recommendations, and fire-resistance-rating requirements.
 - 1. Space screws a maximum of 12 inches (305 mm) o.c. along framing members.

3.3 INSTALLING PANELS

- A. Single-Layer Application:
 - 1. Apply gypsum base panels vertically and parallel or horizontally and perpendicular to framing, unless otherwise indicated.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other walls higher than 30 feet (9.0 m), install gypsum base panels horizontally unless otherwise indicated.
 - 2. On Z-furring, apply gypsum base panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
- B. Single-Layer Fastening Methods: Apply gypsum base panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install according to ASTM C 844, as per USG Corporation "Good Design Practices" and in specific locations approved by Architect. Submit for approval.
- C. Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners, unless otherwise indicated].
 - 2. LC-Bead: Use at exposed panel edges.
 - 3. L-Bead: Use where indicated.

3.5 INSTALLING JOINT REINFORCEMENT

- A. Gypsum Base for Veneer Plaster: Reinforce interior angles and flat joints with joint tape and embedding material to comply with ASTM C 843 and with gypsum veneer plaster manufacturer's written recommendations.

3.6 GYPSUM VENEER PLASTERING

- A. Gypsum Veneer Plaster Application: Comply with ASTM C 843 and with veneer plaster manufacturer's written recommendations.
 - 1. Two-Component Gypsum Veneer Plaster:
 - a. Base Coat: Trowel apply base coat over substrate to uniform thickness of approximately 1/16. Fill all voids and imperfections.
 - b. Finish Coat: Trowel apply finish-coat plaster over base-coat plaster to uniform total thickness, base coat plus finish coat, of 3/32 inch.
 - 2. Do not apply veneer plaster to gypsum base if paper facing has degraded from exposure to sunlight. Before applying veneer plaster, use remedial methods to restore bonding capability to degraded paper facing according to manufacturer's written recommendations
- B. Gypsum Veneer Plaster Finish: Smooth-troweled finish

3.7 PROTECTION

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

END OF SECTION

SECTION 09 29 00

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Interior gypsum board.
- B. Related Sections include the following:
 - 1. Division 7 Section "Joint Sealants" for acoustical sealants installed in assemblies that incorporate gypsum board.
 - 2. Division 9 Section "Non-Load-Bearing Steel Framing" for non-structural framing and suspension systems that support gypsum board.

1.2 SUBMITTALS

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

1.3 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.

1.4 STORAGE AND HANDLING

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

1.5 PROJECT CONDITIONS

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

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

PART 2 - PRODUCTS

2.1 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.

2.2 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.
 - 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. 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.
- B. Type X:
 - 1. Thickness: 5/8 inch (15.9 mm).
 - 2. Long Edges: Tapered.
 - a. Firecode; USG Corporation. (U.L. designation: SCX)
 - b. Fire-Shield; National Gypsum Company. (U.L. designation: FSW)
- C. Special Type X: Having improved fire resistance over standard Type X, and complying with requirements of fire-resistance-rated assemblies indicated on Drawings.
 - 1. Thickness: 1/2 inch or 5/8 inch and as required by fire-resistance-rated assembly indicated on Drawings.
 - 2. Long Edges: Tapered.
 - a. Firecode C; USG Corporation. (U.L. Designation: Type C)
 - b. Fire-Shield G; National Gypsum Company. (U.L. designation: FSW-C)

2.3 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:
 - a. Cornerbead.
 - b. L-Bead: L-shaped; exposed long flange receives joint compound.
 - c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

2.4 JOINT TREATMENT MATERIALS

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

B. Joint Tape:

1. Interior Gypsum Wallboard: Paper.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

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.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

C. Thermal Insulation: As specified in Division 7 Section "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. 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.

B. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying face layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints at locations indicated on Drawings or, if not indicated, according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 1. Cornerbead: Use at outside corners, unless otherwise indicated.

2. L-Bead: Use at exposed terminations of board.

3.5 FINISHING GYPSUM BOARD

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

3.6 PROTECTION

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

END OF SECTION

SECTION 09 66 23

RESINOUS MATRIX TERRAZZO FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Refinishing of floors and base, with epoxy resin terrazzo, to match finish of existing sand cushion terrazzo system.
2. Installation of terrazzo flooring at new Nave floor slab to match adjacent, existing terrazzo.

B. Related Section:

1. Division 3 Section "Cast in Place Concrete" for curing time and finish of slab infill at Nave.
2. Division 7 Section "Joint Sealants" for sealants installed with terrazzo.

1.2 SUBMITTALS

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

1. Shop Drawings: Include terrazzo installation requirements and methods. Include plans, elevations, sections, component details, and attachments to other work.

B. Samples for Verification: For each type, material, color, and pattern of terrazzo showing the full range of color, texture, and pattern variations expected when matching existing. Match existing terrazzo color, aggregate and divider strips. Label each terrazzo sample to identify manufacturer's matrix color and aggregate types, sizes, and proportions. Prepare samples of same thickness and from same material to be used for the Work in size indicated below:

1. Terrazzo: 6-inch- (150-mm-) square Samples.
2. Precast Terrazzo: 6-inch- (150-mm-) square Samples.

C. Maintenance Data: For terrazzo to include in maintenance manuals.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who is acceptable to terrazzo manufacturer to install manufacturer's products.

B. Source Limitations: Obtain primary terrazzo materials from one source from a single manufacturer. Provide secondary materials including patching and fill material, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.

- C. Source Limitations for Aggregates: Obtain each color, grade, type, and variety of granular materials from one source with resources to provide materials of consistent quality in appearance and physical properties.
- D. NTMA Standards: Comply with NTMA's "Terrazzo Specifications and Design Guide" and with written recommendations for terrazzo type indicated unless more stringent requirements are specified.
- E. Mockups For Alternate and Base Bid: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockups for terrazzo of size indicated.
 - a. Size: Minimum 100 sq. ft. (9 sq. m) of typical poured-in-place flooring and base condition for each color and pattern in locations directed by Architect.
 - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in supplier's original wrappings and containers, labeled with source's or manufacturer's name, material or product brand name, and lot number if any.
- B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting terrazzo installation.
- B. Field Measurements: Verify actual dimensions of construction contiguous with precast terrazzo by field measurements before fabrication.
- C. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.
- D. Close spaces to traffic during terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.

- E. Control and collect dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.
 - 1. Provide dustproof partitions and temporary enclosures to limit dust migration and to isolate areas from noise.

PART 2 - PRODUCTS

2.1 EPOXY-RESIN TERRAZZO

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. General Polymers Corporation; Terrazzo.
 - 2. Key Resin Company; Key Epoxy Terrazzo.
 - 3. Master Terrazzo Technologies LLC; Morricite.
 - 4. Polymerica Incorporated; MasterPiece ETS.
 - 5. Quadrant Chemical Corporation; Quadset Epoxy Terrazzo.
 - 6. TEC Specialty Construction Brands, Inc.; Tuff-Lite Epoxy Terrazzo.
 - 7. Terrazzo & Marble Supply Companies; Terroxy Resin Systems.
- B. Materials:
 - 1. Flexible Reinforcing Membrane: Manufacturer's resinous membrane for substrate crack preparation and reflective crack reduction.
 - a. Reinforcement: Fiberglass scrim.
 - 2. Primer: Manufacturer's product recommended for substrate and use indicated.
 - 3. Epoxy-Resin Matrix: Manufacturer's standard recommended for use indicated.
 - a. Colors:
 - 1) Match existing.
 - b. Physical Properties without marble aggregates
 - 1) Hardness: 60 to 85 per ASTM D 2240, Shore D.
 - 2) Minimum Tensile Strength: 3000 psi (20.7 MPa) per ASTM D 638 for a 2-inch (51-mm) specimen made using a "C" die per ASTM D 412.
 - 3) Minimum Compressive Strength: 10,000 psi (6.9 MPa) per ASTM D 695, Specimen B cylinder.
 - 4) Chemical Resistance: No deleterious effects by contaminants listed below after seven-day immersion at room temperature per ASTM D 1308.
 - a) Distilled water.
 - b) Mineral water.
 - c) Isopropanol.
 - d) Ethanol.
 - e) 0.025 percent detergent solution.

- f) 1.0 percent soap solution.
 - g) 10 percent sodium hydroxide.
 - h) 10 percent hydrochloric acid.
 - i) 30 percent sulfuric acid.
 - j) 5 percent acetic acid.
- c. Physical Properties with Marble Aggregates: For resin blended with Georgia white marble, ground, grouted, and cured per requirements in NTMA's "Terrazzo Specifications and Design Guide," comply with the following:
- 1) Flammability: Self-extinguishing, maximum extent of burning 0.25 inch (6.35 mm) per ASTM D 635.
 - 2) Thermal Coefficient of Linear Expansion: 0.0025 inch/inch per deg F (0.0025 mm/mm per 0.5556 deg C) for temperature range of minus 12 to plus 140 deg F (minus 24 to plus 60 deg C) per ASTM D 696.
4. Marble Aggregates: Complying with NTMA gradation standards for mix indicated and containing no deleterious or foreign matter.
- a. Abrasion and Impact Resistance: Less than 40 percent loss per ASTM C 131.
 - b. 24-Hour Absorption Rate: Less than 0.75 percent.
 - c. Dust Content: Less than 1.0 percent by weight.
5. Finishing Grout: Resin based.
6. Crack Isolation Membrane: Manufacturers recommendation for use in the following:
- a. Install under 100% of new terrazzo.
- C. Terrazzo: Comply with NTMA's "Terrazzo Specifications and Design Guide" and manufacturer's written instructions for matrix and marble aggregate proportions and mixing.

2.2 STRIP MATERIALS

- A. Thin-Set Divider Strips: L-type angle or T-type, approximately 1/4 inch (6.4 mm) deep.
- 1. Match installed appearance of existing and align with existing.

2.3 MISCELLANEOUS ACCESSORIES

- A. Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use and acceptable to terrazzo manufacturer.
- 1. Use adhesives that have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Anchoring Devices:
- 1. Strips: Provide mechanical anchoring devices for strip materials as required for secure attachment to substrate.

- C. Patching and Fill Material: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.
- D. Joint Compound: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.
- E. Cleaner: Chemically neutral cleaner with pH factor between 7 and 10 that is biodegradable, phosphate free, and recommended by sealer manufacturer for use on terrazzo type indicated.
- F. Sealer: Slip- and stain-resistant penetrating-type sealer that is chemically neutral with pH factor between 7 and 10; does not affect color or physical properties of terrazzo; is recommended by sealer manufacturer; and complies with NTMA's "Terrazzo Specifications and Design Guide" for terrazzo type indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

3.2 REFINISHING TERRAZZO FLOORS AND BASES

- A. Initial Grinding: Grind with 24 or finer grit stone, all in the presence of water. Follow initial grind with 80 or finer grit stones in the presence of water, but omit sand.
- B. Grouting: Cleanse floor with ample clean water and rinse. Remove excess water and mashing or hand-apply grout using a cement/acrylic matrix of flooring material taking care to fill voids.
 - 1. Curing: Grout shall remain on the surface for a minimum of 72 hours.
- C. Fine Grinding: Grind with 80 or finer grit stones until all grout has been removed from the terrazzo surface.

3.3 PREPARATION FOR INSTALLATION OF NEW EPOXY-RESIN TERRAZZO

- A. Clean substrates of substances, including oil, grease, and curing compounds, that might impair terrazzo bond. Provide clean, dry, and neutral substrate for terrazzo application.
- B. Substrate Surfaces:
 - 1. Provide sound surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with terrazzo.

- a. Shot-blast surfaces with an apparatus that abrades the surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
 - b. Repair damaged and deteriorated surfaces according to terrazzo manufacturer's written recommendations.
 - c. Use patching and fill material to fill holes and depressions in substrates according to terrazzo manufacturer's written instructions.
2. Verify that concrete substrates are visibly dry and free of moisture.
 3. Moisture Testing:
 - a. Test for moisture content by method recommended in writing by terrazzo manufacturer. Proceed with installation only after substrates pass testing.
- C. Protect other work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.
1. Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.
- D. Installation of terrazzo indicates acceptance of surfaces and conditions.

3.4 EPOXY-RESIN TERRAZZO INSTALLATION

- A. General: For installation of epoxy-resin terrazzo over new or existing concrete slabs.
1. Comply with NTMA's written recommendations for terrazzo and accessory installation.
 2. Place, rough grind, grout, cure grout, fine grind, and finish terrazzo according to manufacturer's written instructions and NTMA's "Terrazzo Specifications and Design Guide."
 3. Installation Tolerance: Limit variation in terrazzo surface from level to 1/8 inch in 10 feet; noncumulative.
 4. Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.
 5. Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.
- B. Thickness: 1/4 inch to 3/8 inch nominal.
- C. Crack Isolation Membrane:
1. Prepare and prefill substrate cracks with membrane material.
 2. Install membrane to produce full substrate coverage in all areas to receive terrazzo.
 3. Reinforce membrane with fiberglass scrim.
 4. Prepare membrane according to manufacturer's written instructions before applying substrate primer.
 5. Generally provide crack isolation over all visible cracks in existing surfaces, over 100 percent of new and existing slabs and over all fastener holes, dimples, discoloration and defects in existing surfaces.
- D. Primer: Apply to terrazzo substrates according to manufacturer's written instructions.

E. Strip Materials:

1. Divider and Control-Joint Strips:

- a. Install strips in adhesive setting bed without voids below strips, or mechanically anchor strips as required to attach strips to substrate, as recommended by strip manufacturer.

F. Fine Grinding: Grind with stones 120 grit or finer until all grout is removed from surface. Repeat rough grinding, grout coat, and fine grinding if large voids exist after initial fine grinding. Produce surface with a minimum of 70 percent aggregate exposure.

G. Repair: Remove and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to NTMA's written recommendations, as approved by Architect.

3.5 CLEANING AND PROTECTION

A. Cleaning:

1. Remove grinding dust from installation and adjacent areas.
2. Wash surfaces with cleaner according to NTMA's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow to dry thoroughly.

B. Sealing:

1. Seal surfaces according to NTMA's written recommendations.
2. Apply sealer according to sealer manufacturer's written instructions.

C. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure that terrazzo is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 09 75 00

STONE FACING AND FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following interior applications of dimension stone:
 - 1. Wall panels.
 - 2. Flooring including ramps.
 - 3. Treads and risers.
- B. Related Sections include the following:
 - 1. Division 7 Section "Joint Sealants" for sealing joints in interior stone facing.

1.2 SUBMITTALS

- A. Product Data: For the following:
 - 1. Stone.
 - 2. Stone installation materials and other manufactured products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Verification:
 - 1. For stone type indicated, samples not less than 12 inches (300 mm) square. Include three or more Samples and show the full range of variations in appearance characteristics expected in completed Work. Samples will establish the standard by which stone will be judged.
 - 2. For each color of sealant required.
- D. Sealant Compatibility Test Report: From sealant manufacturer, complying with requirements in Division 7 Section "Joint Sealants" and indicating that sealants will not stain or damage stone.
- E. Maintenance Data: For interior stone facing to include in maintenance manuals. Include Product Data for stone-care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate interior stone facing similar in material, design, and extent to that indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

- B. Installer Qualifications: An installer who employs experienced stone setters who are skilled in installing interior stone facing similar in material, design, and extent to that indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- C. Source Limitations for Stone: Obtain stone, from a single quarry with resources to provide materials of consistent quality in appearance and physical properties.
- D. Source Limitations for Other Materials: Obtain each type of grout, stone accessory, sealant, and other material through one source from a single manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Lift stone with wide-belt slings; do not use wire rope or ropes that might cause staining. Move stone, if required, using dollies with cushioned wood supports.
- B. Store stone on wood A-frames or pallets with nonstaining separators and nonstaining, waterproof covers. Ventilate under covers to prevent condensation.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

1.5 PROJECT CONDITIONS

- A. Maintain air and material temperatures to comply with requirements of installation material manufacturers, but not less than 50 deg F (10 deg C).
- B. Field Measurements: Verify dimensions of construction to receive interior stone facing by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabrication without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.6 COORDINATION

- A. Coordinate installation of inserts that are to be embedded in concrete or masonry and similar items to be used by interior stone facing Installer for anchoring and supporting interior stone facing. Furnish setting drawings, templates, and directions for installing such items and deliver to Project site in time for installation.
- B. Time delivery and installation of interior stone facing to avoid extended on-site storage and to coordinate with work adjacent to interior stone facing.

PART 2 - PRODUCTS

2.1 LIMESTONE

- A. Basis of Design Product::
 - a. "MOCA CRÈME LIMESTONE "
 - b. Local Contact: Intrepid Enterprises, 504-348-2861, Harold Prestenburg.
- B. Finishes:
 - 1. Vertical applications: "High Honed" to match Architects' sample.
 - 2. Floors and steps: Honed finish with sealer to achieve Static Coefficient of Friction of 0.6.
 - 3. Ramps: Honed finish with sealer to achieve Static Coefficient of Friction of 0.8.
- C. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.
- D. Thickness:
 - 1. Vertical applications, floors and ramps: 2 centimeters.
 - 2. Treads and Risers: As indicated on Drawings.

2.2 STONE ANCHORS AND ATTACHMENTS

- A. For vertical applications: Wire Tiebacks of No. 8 gage copper wire.

2.3 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II. Provide natural color or white cement as required to produce mortar color selected.
 - 1. Provide white cement for "moulding plaster spots" for wall panels.
 - 2. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or III, and hydrated lime complying with ASTM C 207, Type S.
- D. Colored Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or III; hydrated lime complying with ASTM C 207, Type S; and mortar pigments consisting of natural and synthetic iron oxides. Pigments contain no carbon black, have a record of satisfactory performance in mortar, and do not exceed 10 percent of portland cement by weight. Provide mix formulated to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Essroc, Italcementi Group; Capitol PCL Blend or Saylor's Plus.
 - b. Holcim (US) Inc.; Rainbow Mortamix Custom Color Cement/Lime.
 - c. Lafarge North America Inc.; Eaglebond.
 - d. Lehigh Cement Company; Lehigh Custom Color Portland/Lime Cement.
- E. Aggregate: Aggregate graded with 100 percent passing No. 16 (1.18-mm) sieve.
 1. Colored Aggregates: Natural-colored sand or ground marble, granite, or other durable stone; of color necessary to produce required mortar color.
- F. Mortar Pigments: Natural and synthetic iron oxides, compounded for use in mortar mixes. Use pigments with a record of satisfactory performance in mortar and containing no carbon black.
 1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. Bayer, Industrial Chemicals Div.; Bayferrox Iron Oxide Pigments.
 - b. Davis Colors; True Tone Mortar Colors.
 - c. Solomon Colors; SGS Mortar Colors.
- G. Latex Additive: Acrylic-resin or styrene-butadiene-rubber water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement mortar bed, and not containing a retarder.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Boiardi Products Corporation.
 - b. Bonsal.
 - c. Bostik Findley Inc.
 - d. C-Cure.
 - e. Custom Building Products.
 - f. DAP Inc.
 - g. Laticrete International, Inc.
 - h. MAPEI Corp.
 - i. Summitville Tiles, Inc.
 - j. TEC Specialty Construction Brands; H. B. Fuller Company.

2.4 SEALANTS

- A. Refer to Division 7 Section "Joint Sealants".

2.5 STONE ACCESSORIES

- A. Cleaner: Stone cleaner specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.
- B. Floor Sealer: Colorless, slip- and stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated and to achieve the Static Coefficient of Friction indicated.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bostik Findley Inc.
 - b. Custom Building Products.
 - c. Hillyard, Inc.
 - d. HMK Stone Care System.
 - e. Miracle Sealants Company.
 - f. Stonecare International.
 - g. Summitville Tiles, Inc.

2.6 STONE FABRICATION, GENERAL

- A. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that could impair structural integrity or function.
 - 1. Repairs that are characteristic of the varieties specified are acceptable provided they do not impair structural integrity or function and are not aesthetically unpleasing, as judged by Architect.
- B. Fabricate interior stone facing in sizes and shapes required to comply with requirements indicated, including details on Drawings and Shop Drawings.
- C. Cut stone to produce pieces of thickness, size, and shape indicated and to comply with fabrication and construction tolerances recommended by applicable stone association.
- D. Finish exposed faces and edges of stone to comply with requirements indicated for finish of each type of stone required and to match approved samples.
- E. Carefully inspect finished stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.
 - 1. Grade and mark stone for overall uniform appearance when assembled in place. Natural variations in appearance are acceptable if installed stone units match range of colors and other appearance characteristics represented in approved samples.

2.7 STONE PANELING

- A. Arrange panels in shop or other suitable space in proposed orientation and sequence for examination by Architect. Mark units with temporary sequence numbers to indicate position in proposed layout.
 - 1. Notify Architect seven days in advance of date and time when layout will be available for viewing.
 - 2. Provide lighting of similar type and level as that of final installation for viewing layout, unless otherwise approved by Architect.
 - 3. Rearrange panels as directed by Architect until layout is approved.
 - 4. Do not trim nonmodular-size units to less than modular size until after Architect's approval of layout, unless otherwise approved by Architect.
 - 5. Mark backs of units and Shop Drawings with sequence numbers based on approved layout. Mark backs of units to indicate orientation of units in completed Work.
- B. Size: As indicated on the Drawings.
- C. Joints: 1/8-inch wide, sealant-filled joints.
- D. Pattern Arrangement: Fabricate and arrange panels as indicated on the Drawings.

2.8 STONE FLOORING, RAMPS, RISERS AND TREADS

- A. Fabricate stone stair treads in sizes and profiles indicated.
 - 1. Exposed Edges: Same finish/texture as flat/field portions.
- B. Cut stone to produce pieces of thickness, size, and shape indicated, including details on Drawings and Shop Drawings.
- C. Joints: 1/8-inch wide, grout-filled joints.
- D. Pattern Arrangement: Fabricate and arrange stone units with veining and other natural markings to comply with approvals.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces indicated to receive stone and conditions under which stone will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean dirty or stained stone surfaces 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.
- B. For wall panels, ensure studs and gypsum board are in place to receive stone and anchors.

3.3 SETTING OF STONE, GENERAL

- A. Do necessary field cutting as stone is set. Use power saws with diamond blades to cut stone. Cut lines straight and true, with edges eased slightly to prevent snipping.
- B. Contiguous Work: Provide reveals and openings as required to accommodate contiguous work.
- C. Set stone to comply with requirements indicated on Drawings and Shop Drawings. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure stone in place. Shim and adjust anchors, supports, and accessories to set stone accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
- D. Erect stone units level, plumb, and true with uniform joint widths. Use temporary shims to maintain joint width.

3.4 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/16 inch in 96 inches.
- B. Variation from Level: For lintels, sills, chair rails, horizontal bands, horizontal grooves, and other conspicuous lines, do not exceed 1/16 inch in 10 feet, 1/8 inch in 20 feet.
- C. Variation of Linear Building Line: For position shown in plan and related portion of walls and partitions, do not exceed 1/16 inch in 96 inches, 1/8 inch in 20 feet.
- D. Variation in Cross-Sectional Dimensions: For thickness of walls from dimensions indicated, do not exceed plus or minus 1/16 inch.
- E. Variation in Joint Width: Do not vary joint thickness more than 1/32 inch.
- F. Variation in Plane between Adjacent Stone Units (Lipping): Do not exceed 1/32-inch (0.8-mm) difference between planes of adjacent units.

3.5 INSTALLATION OF STONE PANELS

- A. Wall Panels: Set units firmly against setting spots for wall pane. Locate setting spots at anchors and spaced not more than 18 inches (450 mm) apart across back of unit, but provide no fewer than 1 setting spot per 2 sq. ft. (0.18 sq. m), unless otherwise indicated.
 - 1. Moisture Exposure: Use white cement mortar for setting spots.

2. Drill holes in edges of stone, with chase on back edge to recess wire.
3. Cut holes in gypsum board, filled with white cement.
4. Plumb stone slabs with white cement "spots" between back of stone and gypsum board.
5. Place wire ties in holes at edge of stone slabs and extend through holes in gypsum board.
6. Apply sealant to exposed joints.

3.6 INSTALLATION OF STONE DIRECTLY OVER CONCRETE

- A. Saturate concrete with clean water several hours before placing setting bed. Remove surface water about one hour before placing setting bed.
- B. Apply mortar-bed bond coat to damp concrete and broom to provide an even coating that completely covers the concrete. Do not exceed 1/16-inch (1.5-mm) thickness. Limit area of mortar-bed bond coat to avoid its drying out before placing setting bed.
 1. Place reinforcing wire mesh over concrete, lapped at joints by at least one full mesh and supported so mesh becomes embedded in middle of setting bed. Hold edges back from vertical surfaces about 1/2 inch (13 mm).
- C. Apply mortar bed immediately after applying mortar-bed bond coat. Spread, tamp, and screed to uniform thickness at elevations required for setting stone to finished elevations indicated.
- D. Mix and place only that amount of mortar bed that can be covered with stone before initial set. Cut back, bevel edge, and discard material that has reached initial set before stone can be placed.
- E. Place stone before initial set of mortar occurs. Immediately before placing stone on setting bed, apply uniform 1/16-inch- (1.5-mm-) thick bond coat to bed or to back of each stone unit.
- F. Tamp and beat stone with a wooden block or rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances. Set each unit in a single operation before initial set of mortar; do not return to areas already set and disturb stone for purposes of realigning finished surfaces or adjusting joints.
- G. Rake out joints to depth required to receive grout as units are set.
- H. Grout stone joints with polymer-modified cement grout to comply with ANSI A108.10 and with manufacturer's written instructions.
 1. Do not use sanded grout for polished stone.
Grout joints as soon as possible after initial set of setting bed. Force grout into joints, taking care not to smear grout on adjoining stone and other surfaces. After initial set of grout, finish joints by tooling to produce a slightly concave polished joint, free of drying cracks.
 2. Cure grout by maintaining in a damp condition for seven days except as otherwise recommended by manufacturer.

3.7 STONE STAIR TREAD AND RISER INSTALLATION

- A. Install stone stair treads and risers to comply with "Installation of Stone Directly over Concrete" Article.

3.8 JOINT-SEALANT INSTALLATION

- A. Prepare joints and apply sealants at wall panels to comply with applicable requirements in Division 7 Section "Joint Sealants." Remove temporary shims before applying sealants.

3.9 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean interior stone as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.
- B. Remove and replace interior stone of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
 - 2. Defective stone.
 - 3. Defective joints, including misaligned joints.
 - 4. Interior stone and joints not matching approved Samples.
 - 5. Interior stone not complying with other requirements indicated.
- C. Replace in a manner that results in interior stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.
- D. Clean interior stone no fewer than six days after completion of grouting and pointing, using clean water and soft rags or stiff-bristle fiber brushes. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage stone.
- E. Sealer Application: Apply stone sealer on horizontal surfaces to comply with stone producer's and sealer manufacturer's written instructions and recommendations and to achieve specified coefficient of friction for slip resistance.

3.10 PROTECTION

- A. Protect stone surfaces, edges, and corners from construction damage. Use securely fastened untreated wood, plywood, or heavy cardboard to prevent damage.
- B. Before inspection for Substantial Completion, remove protective coverings and clean surfaces.

END OF SECTION

SECTION 09 91 13

EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Steel.
 - 2. Plaster
 - 3. Wood

- B. Related Sections include the following:
 - 1. Division 8 Sections for factory priming doors with primers specified in this Section.
 - 2. Division 9 Section "Interior Painting" for surface preparation and the application of paint systems on interior substrates.
 - 3. Division 22 thru 28 for Mechanical and Electrical items.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of topcoat product indicated.

1.3 QUALITY ASSURANCE

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

- B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on benchmark samples.
 - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.4 DELIVERY, STORAGE, AND HANDLING

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

1.5 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

2.2 PAINT, GENERAL

- A. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- B. Colors: As indicated in Division 9 Section "Material and Color Selections".

2.3 METAL PRIMERS

- A. Quick-Drying Alkyd Metal Primer: MPI #76.

2.4 EXTERIOR LATEX PAINTS

- A. Exterior Latex (Semigloss): MPI #11 (Gloss Level 5).

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- D. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
- E. Exterior Walnut Veneer Entrance Doors: Preparation in strict compliance with manufacturer's recommendations.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
- 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. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance of paint materials with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.5 CLEANING AND PROTECTION

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

3.6 EXTERIOR PAINTING SCHEDULE

- A. Steel (Ferrous Metal) Substrates: Generally, but not necessarily limited to, plaza railings, supports for cast stone benches and cast iron downspout boot.
 - 1. Prime Coat: Polyurethane Zinc-rich Primer
 - a. Test Method: ASTM G 85 Prohesion
 - 1) Requirement: No blistering, cracking, or delamination of film. No more than 1/64" rust creepage at the scribe after 15,000 hours.
 - b. Test Method: ASTM B 117 Salt Fog
 - 1) Requirement: No blistering, cracking, or delamination of film. No more than 1% rusting on the surface and no more than 1/4" rust creepage at the scribe after 20,000 hours.
 - 2. Intermediate Coat: Polyamide epoxy
 - a. Test Method: ASTM G 85 Prohesion
 - 1) Requirement: No blistering, cracking, or delamination of film. No more than 1/8" rust creepage at the scribe after 5,000 hours.
 - b. Test Method: ASTM B 117 Salt Fog
 - 1) Requirement: No blistering, cracking, delamination or rusting on the plane and no rust creepage at the scribe after 10,000 hours (with zinc primer).
 - 3. Topcoat: Thermoset Fluoropolymer
 - a. Test Method: ASTM D 4141 EMMAQUA
 - 1) Requirement: No blistering, cracking or chalking. No less than 96% gloss retention after 1,260 MJ/m² EMMAQUA exposure.
 - b. Test Method: ASTM D 4587 QUV Exposure (UVA 340 bulbs, Cycle 4: 8 hours UV/4 hours condensation)
 - 1) Requirement: No blistering, cracking, or chalking. No less than 93% gloss retention after 10,000 hours exposure.
 - c. Volume Solids
 - 1) Requirement: No less than 60% volume solids.

- B. Steel (Galvanized) Substrates: Generally, but not necessarily limited to, existing galvanized hollow metal frames and miscellaneous mechanical and electrical items.
 - 1. Quick-Drying Enamel System: MPI EXT 5.1A.
 - a. Prime Coat: Quick-drying alkyd metal primer.
 - b. Intermediate Coat: Quick-drying enamel matching topcoat.
 - c. Topcoat: Quick-drying enamel (semigloss).
- C. Fiber Cement Board: Generally, but not necessarily limited to, fiber cement board soffits.
 - 1. Latex System: MPI EXT 9.1A.
 - a. Prime Coat: Exterior latex matching topcoat.
 - b. Intermediate Coat: Exterior latex matching topcoat.
 - c. Topcoat: Exterior latex (semigloss or gloss to match color of adjacent stone wall panels or as selected by the Architect).
- D. Plaster: Generally, but not necessarily limited to, new plaster walls.
 - 1. “Exterior plaster shall receive a breathable elastomeric coating with Neoflex: Neogard, as the basis of design”.
- E. Exterior Solid-Core Walnut Veneer Entrance Doors and Transom Panels:
 - 1. Alkyd High Performance, High Solids Transparent Finish.
 - a. Three (3) coats of Cetol Door & Window formulation, Sikkens Wood Finishes by Akzo Nobel Paints, 866-745-5367, as the Basis of Design.
 - b. Color Range: 003 Colorless (Clear)
 - c. Sheen: Clear Satin.
- F. Exterior Solid-Core Doors For Opaque Finish:
 - 1. Alkyd System MPI EXT 6.3
 - a. Prime Coat: Exterior Alkyd or Oil Wood Primer – MPI #5 or MPI #7
 - b. Intermediate Coat: Exterior Alkyd, Semi-Gloss, MPI #94.
 - c. Topcoat: Same as Intermediate Coat.

END OF SECTION

SECTION 09 91 23

INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior Church substrates only (no painting required at Rectory):
1. Clay masonry.
 2. Steel.
 3. Wood.
 4. Gypsum board.
 5. Plaster.
- B. Related Requirements:
1. Division 1 Section "Alternates" for description of work under this Section affected by alternates.
 2. Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.
 3. Factory- or shop-applied primers applied as Work of other Sections must be coordinated with field-applied finish coats. Review other Sections for factory- or shop-primed products and reference this Section for product requirements.
 4. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
 5. Division 06 Sections for factory transparent finishing of wood millwork items.
 6. Division 08 Sections for factory priming doors and frames with primers specified in this Section.
 7. Division 09 Section "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.
 8. Division 22 thru 28 for Mechanical and Electrical items.

1.2 DEFINITIONS

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

- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 QUALITY ASSURANCE

- A. 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 specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - 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.

1.5 DELIVERY, STORAGE, AND HANDLING

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

1.6 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Colors: As selected by Architect from manufacturer's full range.
 - 1. 10 percent of surface area will be painted with deep tones.

2.3 SOURCE QUALITY CONTROL

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

- D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
 - 1. Existing brick must be thoroughly cleaned by hot pressure washing or special cleaners before applying paints ”.
- E. Steel Substrates: Remove rust, loose mill scale, and shop primer, and existing paint if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 3, "Power Tool Cleaning."
 - 2. Prepare existing hollow metal steel frames sufficiently to ensure previous paint ridges do not telegraph through new coating.
- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

3.3 APPLICATION

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

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. Clay-Masonry Substrates:
 - 1. Latex System:
 - a. Prime Coat: Latex, interior, matching topcoat.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, (Gloss Level 2) MPI #44.
 - d. Locations: Those areas indicated on the Finish Schedule of the Drawings.
- B. Steel Ferrous Metal Substrates:
 - 1. Alkyd System:
 - a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79 or primer, alkyd, quick dry, for metal, MPI #76.
 - b. Prime Coat may be applied as a shop primer specified in other Sections.
 - c. Intermediate Coat: Alkyd, interior, matching topcoat.
 - d. Topcoat: Alkyd, interior, semi-gloss (Gloss Level 5), MPI #47.
 - e. Locations: Generally, but not necessarily limited to, existing and new hollow metal steel doors and frames, handrails and brackets, fire extinguisher cabinets and miscellaneous exposed Mechanical and Electrical items.

C. Wood Substrates:

1. Alkyd System:

- a. Prime Coat: Primer sealer, alkyd, interior, MPI #45.
- b. Intermediate Coat: Alkyd, interior, matching topcoat.
- c. Topcoat: Alkyd, interior, semi-gloss (Gloss Level 5), MPI #47.
- d. Locations: Generally, but not necessarily limited to, wood doors and Stations of the Cross infill panels.

D. Gypsum Board and Plaster Substrates:

1. Latex System:

- a. Prime Coat: Primer sealer, latex, interior, MPI #50.
- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior, (Gloss Level 2), MPI #44.
- d. Locations: Generally, but not necessarily limited to, gypsum board, new and existing plaster walls, ceilings, furrdowns and soffits and existing ceiling ribs between wood slats.

END OF SECTION

