

SECTION 09100 - CONSTRUCTION TRAFFIC CONTROL

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

- A. This item shall consist of the construction, manipulation, maintenance and removal, if required, of detours of the length and to the lines, grades, and typical sections indicated and providing for installing, moving, replacing, maintaining, cleaning and removing upon completion of the work, as required, all detour markers, signs, barricades and other devices used in traffic control and handling at the construction site as indicated or as directed by the ENGINEER.
- B. This item shall also consist of providing, installing, moving, replacing, maintaining, cleaning and removing temporary or permanent street closure barricades, signs or other devices required to handle the traffic in conformance with the current edition of the Texas Manual of Uniform Traffic Control Devices for Street and Highways and as indicated or directed by the ENGINEER.

PART 2 - PRODUCTS

2.01 CONSTRUCTION TRAFFIC CONTROL SIGNS:

- A. Construction traffic control signs shall conform to the provisions of Section 9000 except as noted in the plans or as directed by the ENGINEER.
- B. Construction traffic control signs used herein shall be fabricated using sheeting conforming to the requirements of Table 9000-3.
- C. The substrate for construction signs need only be sufficiently durable to last the life of the project and sufficiently rigid to hold the sheeting in a flat plane.

2.02 SIGN SUPPORTS:

- A. Supports for construction traffic control signs shall be grade #2 fir or yellow pine, pressure treated with pentachlorophenol.
- B. Supports shall have a minimum nominal size of 4-inches x 4-inches and conform to the details shown on the plans.

2.03 PORTABLE SIGN SUPPORT:

- A. Materials for portable sign supports shall comply with the details shown on the plans. Portable sign supports other than those shown on the plans shall be submitted to the Project Manager for approval prior to use.

2.04 BARRICADES:

- A. Barricades shall be classified as Type I, Type II, or Type III and shall comply with the details shown on the plans and the TMUTCD.
- B. Barricade rails shall be fabricated using grade #2 fir or yellow pine and reflectorized sheeting conforming to the requirements shown in Table 9000-3.

2.05 VERTICAL PANELS:

- A. Materials for vertical panels shall conform to the details shown on the plans. Vertical panels shall be reflectorized with orange and white reflective sheeting or tape in accordance with the requirements of the TMUTCD and Table 9000-3.

2.06 CONSTRUCTION TRAFFIC MARKINGS:

- A. Construction traffic markings shall comply with Section 9990 and the details shown in the plans.

2.07 ABBREVIATED PAVEMENT MARKINGS FOR CONSTRUCTION:

- A. The pavement-marking material shall consist of an adhesive-backed reflective tape that can be applied to the pavement. Markings shall be of good appearance, have straight, unbroken edges and have a color that complies with all federal regulations.

1. Color

- a) The markings, as well as retroreflected light from the markings, shall be white or yellow as indicated.

2. Visibility

- a) The pavement markings (during daylight hours) shall be distinctively visible for a minimum of 300 feet unless sight distance is restricted by geometric roadway features.
- b) The pavement markings (when illuminated by automobile low beam headlights at night) shall be distinctly visible for a minimum of 160 feet unless sight distance is restricted by geometric features.
- c) The above day and night visibility requirements shall be met when viewed from an automobile traveling on the roadway.

2.08 CHANNELIZATION DEVICES:

A. Barrels

- 1. Barrels shall be of metal or nonmetal composition approved by the ENGINEER and of 30 to 55 gallon capacity. Only one size may be used on the project. The barrels shall be reflectorized with orange and white reflective sheeting or tape in accordance with the requirements of TMUTCD and Table

The markings on the barrels shall be horizontal, circumferential, orange, and wide. There shall be a minimum of 55 alternating orange and white stripes on each barrel. Barrels shall also conform to the details shown on the plans.

2. Type "B" barrels shall be equipped with either Type "A" low intensity or Type "C" steady-burn warning lights complying with the provisions to TMUTCD and the ITE standard for flashing and steady-burn lights. The use of warning lights shall be as directed by the ENGINEER.

B. Traffic Cones

1. Traffic cones shall conform to the details shown on the plans.

C. Tubular Traffic Markers

1. Post

- a) The post shall be of a thermoplastic or pliable elastomer composition meeting the manufacturer's requirements.

b) Properties:

Outside Diameter.....2.23 inches to 4 inches
Wall Thickness.....0.125 inches min.
Length.....18 to 36 inches
Color.....Orange

2. Base

- a) The base shall be of a thermoplastic or pliable elastomer composition meeting the manufacturer's requirements.

b) Properties:

Height :.....1/2 to 2 inches
Outside Diameter:... 7 to 12 inches
Color:black or same color as post

3. Assembly Units

- a) Assembly units which are inherent with the particular marker shall be as per manufacturer's recommendations.

4. Adhesives

- a) Adhesive shall be epoxy type (temporary installation, permanent installation or butyl type) as per manufacturer's recommendations.
- b) Other methods approved by the ENGINEER prior to initiating the work may be used; however, said approval does not abrogate the CONTRACTOR'S responsibility of effecting the temporary or permanent installation.

5. Reflectorization

- a) If used at night, tubular traffic markers shall have two 3-inch, circumferential reflective bands, no more than 2-inches from the top with no more than 6-inches separating the bands. Reflective material shall be SIA-250 or higher sheeting conforming to the provisions of Section 9000. The color of reflective material shall be as shown in the plans.

2.09 SEQUENTIAL ARROW DISPLAYS

- A. Sequential arrow displays shall be sequentially lighted and roof or trailer mounted. The minimum panel size shall be 30-inches high and 54-inches wide. The display shall have 22 hooded sealed beam amber lamps rated at a maximum intensity of 8800 candlepower.
- B. Light intensity shall be adjustable by dimmer switch. The operating modes shall be as follows:
 1. Pass Left. 3 chevrons of 5 lamps each sequence in right to left pattern, 40 to 50 times per minute.
 2. Pass Right. 3 chevrons of 5 lamps each sequence in left to right pattern, 40 to 50 times per minute.
 3. Pass Either Side. The two outermost chevrons on each end of the panel pointing like arrowheads and flashing 40 to 50 times per minute with crossing row of lamps burning continuously.
 4. Warning. 4 lamps, one at each corner of the panel, flashing 40 to 50 times per minute.

2.10 MATERIALS FOR CONSTRUCTION DETOURS

- A. Flexible Base
 1. Flexible base shall conform to Section 2601.
- B. Asphalt Treated Base
 1. Asphalt treated base shall conform to Section 2604.
- C. Prime Coat
 1. Prime Coat shall conform to Section 2610.
- D. Tack Coat
 1. Tack Coat shall conform to Section 2620.
- E. Seal Coat

- 1. Seal Coat shall conform to Section 2617 or Section 2645.
- F. Hot Mix Asphaltic Concrete Pavement
 - 1. Hot Mix shall be Type D conforming to Section 2612.
- G. Seeding
 - 1. Seeding shall conform to Section 0000.

PART 3 - EXECUTION

3.01 CONSTRUCTION TRAFFIC CONTROL SIGNS AND SIGN SUPPORTS:

- A. Construction traffic control signs and sign supports shall be installed at locations noted on the plans in conformance with the TMUTCD or as directed by the ENGINEER.

3.02 PORTABLE SIGN SUPPORTS:

- A. Portable sign supports for traffic control devices for detours shall be furnished by the CONTRACTOR or shall be installed at the locations shown on the plans, and shall remain the property of the CONTRACTOR.
- B. Unless otherwise specified, portable sign supports shall be of the dimensions shown on the plans.

3.03 BARRICADES:

- A. Barricades shall be installed in conformity with the details noted on the plans or as directed by the ENGINEER.

3.04 VERTICAL PANELS:

- A. Vertical panels shall be installed in conformity with the details noted on the plans or as directed by the ENGINEER.

3.05 CONSTRUCTION TRAFFIC MARKINGS:

- A. Construction traffic markings shall be installed in conformity with Section 9990 and the details shown on the plans or as directed by the ENGINEER.

3.06 ABBREVIATED PAVEMENT MARKING FOR CONSTRUCTION:

- A. Abbreviated markings meeting all specification requirements shall be in place on all roadways on which traffic is allowed and where suitable standard pavement marking is not in place. The transverse location of the line(s) formed by the markings shall be as determined by the ENGINEER.
- B. Unless otherwise indicated, the abbreviated markings shall be placed as follows:

<u>Condition</u>	<u>Spacing</u>	<u>Length of Stripe</u>
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Straight	40 feet approximately	48 inch
Curve greater than 2 degrees	20 feet maximum	48 inch
Curve less than or equal 2 degrees	40 feet maximum	48 inch

- C. Pavement markings shall be a minimum of 3-7/8 inches wide. Length and spacing will be in accordance with these specifications.
- D. The spacing of stripes may be modified by the ENGINEER. However, the maximum spacing specified above shall not be exceeded in any case.
- E. The CONTRACTOR will be responsible for maintaining the abbreviated pavement markings until standard pavement markings are in place.
- F. Abbreviated pavement markings shall be removed after all permanent markings have been placed.

3.07 CHANNELIZATION DEVICES:

- A. Type "A" Barrels
 - 1. Type "A" barrels shall be used during daylight hours only and shall not be equipped with warning lights of any type. The term "daylight hours" refers to those hours between dawn and dusk.
- B. Type "B" Barrels
 - 1. Type "B" barrels shall be equipped with warning lights. Type "B" barrels shall be used during nighttime hours only, unless otherwise shown on the plans or directed by the Project Manager. The term "nighttime hours" refers to those hours between dusk and dawn.
- C. Traffic Cones
 - 1. Traffic cones shall be installed in conformity with the plans and the TMUTCD or as directed by the ENGINEER.
- D. Tubular Traffic Markers
 - 1. The metal, concrete, or bituminous surface where the tubular traffic markers are to be placed shall be thoroughly cleaned.
 - 2. Metal and concrete surfaces shall be sandblasted or wire brushed. Bituminous surfaces shall be cleaned in accordance with manufacturer's recommendations.
 - 3. All loose sand, dust and other deleterious debris from cleaned mounting

surfaces shall be removed.

4. Tubular traffic markers shall be installed in conformity with details and at locations shown on the plans or as directed by the ENGINEER and in accordance with the manufacturer's recommendation.
 5. In the event that removal of an installation (temporary or permanent) is effected and the metal, concrete, or bituminous surface is damaged the CONTRACTOR shall repair and otherwise restore said surface to its original condition at no additional cost to the City.
 6. All defective post(s), base(s), assembly unit(s), adhesive(s), or reflective sheeting contributing to the detriment of the intended function of the tubular traffic markers shall be replaced by the CONTRACTOR at no additional cost to the City.
- E. Channelization devices shall be installed and of the type in accordance with the details shown on the plans. Barrels shall be as noted herein.

3.08 SEQUENTIAL ARROW DISPLAY:

- A. Sequential arrow displays shall be used according to the requirements shown on the plans and as shown in TMUTCD.

3.09 CONSTRUCTION DETOURS:

- A. The detours shall be constructed at the locations and to the lines and grades indicated. It shall be the entire responsibility of the CONTRACTOR to provide for the passage of traffic in comfort and safety without creating a dust problem.

3.10 CONSTRUCTION METHODS:

- A. Prior to commencing construction, suitable "Construction Traffic Control" devices shall be installed to protect the workers and the public.
- B. The CONTRACTOR shall be responsible for installing all markers, signs and barricades conforming to The Texas Manual on Uniform Traffic Control Devices and/or as indicated. If, in the opinion of the ENGINEER, additional markers, signs or barricades are needed in the interest of safety, the CONTRACTOR will install such as are required or as directed by the ENGINEER.

3.11 MAINTENANCE:

- A. It shall be the CONTRACTOR'S responsibility to maintain, clean, move and replace if necessary, barricades, signs and traffic handling devices during the time required for construction of the project. Permanent barricades shall be constructed as required after the completion of the streets by drilling holes to place the posts and concrete foundations. Foundation concrete shall be cured before the rails are attached.
- B. When no longer needed, all temporary barricades, signs and traffic handling devices shall be removed and the area restored to its original condition or as directed by the ENGINEER.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement of various items described in this specification, complete in place, will be made as follows:
 - 1. Construction traffic control sign assemblies, consisting of the applicable signage mounted on either sign supports or portable sign supports, shall be measured per each or lump sum.
 - 2. Barricades shall be measured by the type per each.
 - 3. Vertical panels shall be measured per each. Supports required for vertical panels will not be measured for payment but will be considered incidental to the completion of the work.
 - 4. Construction traffic markings shall be measured per linear foot.
 - 5. Abbreviated pavement markings for construction shall be measured per linear foot.
 - 6. Channelization devices shall be measured per each for the category and type shown.
 - 7. Sequential arrow display shall be measured per each.
 - 8. Construction detours shall be measured per each or considered incidental to completion of construction.
 - 9. Construction traffic control plan, consisting of any or all of the items described herein, shall be measured lump sum or incidental to completion of construction.

4.02 PAYMENT:

- A. The accepted quantities of construction traffic control devices shall be paid at the contract unit bid price per the unit of measurement noted above or as noted on the bid proposal.
- B. Compensation will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

END OF SECTION

SECTION 09220 - PORTLAND CEMENT PLASTER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Metal framing and furring.
 - 2. Metal lath and accessories.
 - 3. Plastic accessories.
 - 4. Portland cement plaster.
 - 5. Stucco finishes.
 - 6. Acrylic-based finishes.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 5 Section "Cold-Formed Metal Framing" for load-bearing steel studs and joists.
 - 2. Division 6 Section "Rough Carpentry" for wood framing and furring.
 - 3. Division 9 Section "Gypsum Sheathing" for gypsum sheathing installed behind metal lath.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each product specified.
- C. Samples for initial selection in the form of manufacturer's color charts consisting of actual units or sections of units at least 12 inches (300 mm) square showing the full range of colors, textures, and patterns available for each type of finish indicated.
 - 1. Where finish involves normal color and texture variations, include Sample sets composed of 2 or more units showing the full range of variations expected.
 - 2. Include similar Samples of material for joints and accessories involving color selection.
- D. Samples for verification in units at least 12 inches (300 mm) square of each type of finish indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
- E. Material Certificates: Submit certificate signed by manufacturer for each kind of plaster aggregate certifying that materials comply with requirements.

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Where fire-resistance-rated portland cement plaster assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Mockups: Prior to installing plaster work, construct panels for each type of finish and application required to verify selections made under Sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.

1. Locate mockups on-site in the location and of the size indicated or, if not indicated, as directed by Architect.
2. Erect mockups 48 by 48 inches (1200 by 1200 mm) by full thickness in presence of Architect using materials, including lath, support system, and control joints, indicated for final Work.
3. Notify Architect 7 days in advance of the dates and times when mockups will be constructed.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Architect's approval of mockups before start of plaster Work.
6. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed portland cement plaster Work.
 - a. When directed, remove mockups from Project site.

1.5 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.

1.6 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. Exterior Plaster Work: Protect plaster against freezing when ambient temperature is below 40 deg F (4 deg C) by heating materials and providing temporary protection and heat as required by ACI 306R.
- F. Interior Plaster Work: Maintain at least 50 deg F (10 deg C) temperature in areas to be plastered for at least 48 hours before, during, and after application.
- G. Ventilation: Provide natural or mechanical means of ventilation to properly dry interior spaces after portland cement plaster has cured.
- H. 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:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Metal Framing and Supports:
 - a. Alabama Metal Industries Corp. (AMICO).

- b. American Studco, Inc.
 - c. Angeles Metal Systems.
 - d. California Expanded Metal Products Co.
 - e. Clark Steel Framing, Inc.
 - f. Consolidated Systems, Inc.
 - g. Dale//Incor Industries, Inc.
 - h. Dietrich Industries, Inc.
 - i. Marino-Ware Industries.
 - j. National Gypsum Co.
 - k. Unimast, Inc.
 - l. Western Metal Lath Co.
2. Expanded-Metal Lath:
- a. Alabama Metal Industries Corp. (AMICO).
 - b. California Expanded Metal Products Co.
 - c. Dale//Incor Industries, Inc.
 - d. Dietrich Industries, Inc.
 - e. National Gypsum Co.
 - f. Unimast, Inc.
 - g. United States Gypsum Co.
 - h. Western Metal Lath Co.
3. Wire-Fabric Lath:
- a. Davis Wire Corporation.
 - b. Jaenson Wire Company.
 - c. Keystone Steel & Wire Co.
 - d. K-Lath Building Products.
4. Metal Accessories:
- a. Alabama Metal Industries Corp. (AMICO).
 - b. California Expanded Metal Products Co.
 - c. Dale//Incor Industries, Inc.
 - d. Delta Star, Inc.
 - e. Flannery, Inc.
 - f. Fry Reglet Corporation.
 - g. Gordon, Inc.
 - h. Metalex (Keene Products).
 - i. MM Systems Corp.
 - j. National Gypsum Co.
 - k. Pittcon Industries.
 - l. Stockton Products.
 - m. Unimast, Inc.
 - n. United States Gypsum Co.
 - o. Western Metal Lath Co.
5. Plastic Accessories:
- a. Alabama Metal Industries Corp. (AMICO).
 - b. Plastic Components, Inc.
 - c. Vinyl Corp.
6. Stucco:
- a. California Stucco Products Corp.
 - b. Florida Stucco Corp.
 - c. Highland Stucco.
 - d. IPA Systems, Inc.
 - e. United States Gypsum Co.
7. Acrylic-Based Finishes:
- a. Bonsal: W.R. Bonsal Co.

- b. Dryvit Systems, Inc.
- c. EIFS Incorporated.
- d. Parex Incorporated.
- e. Senergy, Inc.
- f. Sto Industries.
- g. Stuc-O-Flex International.

2.2 METAL SUPPORTS FOR SUSPENDED AND FURRED CEILINGS

- A. General: Size metal ceiling supports to comply with ASTM C 1063, unless otherwise indicated.
- B. Cast-in-Place and Postinstalled Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials, with holes or loops for attaching hanger wires; and with capability to sustain, without failure, a load equal to 5 times that imposed by ceiling construction, as determined by testing according to ASTM E 488 conducted by a qualified independent testing agency.
 - 1. Cast-in-place type designed for attachment to concrete forms.
 - 2. Chemical anchor.
 - 3. Expansion anchor.
- C. Wire for Hangers and Ties: ASTM A 641 (ASTM A 641M), Class 1 zinc coating, soft temper.
- D. Rod Hangers: Mild steel, zinc coated.
- E. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- F. Channels: Cold-rolled steel, minimum 0.0598-inch- (1.5-mm-) thick base (uncoated) metal and 7/16-inch- (11.1-mm-) wide flanges, and as follows:
 - 1. Carrying Channels: 2-inch- (50-mm-) deep-by-19/32-inch- (15-mm-) wide flanges, 590 lb/1000 feet (0.87 kg/m).
 - 2. Carrying Channels: 1-1/2 inches (38 mm) deep, 475 lb/1000 feet (0.7 kg/m).
 - 3. Furring Channels: 3/4 inch (19 mm) deep, 300 lb/1000 feet (0.45 kg/m).
 - 4. Finish: Rust-inhibitive paint, unless otherwise indicated.
 - 5. Finish: ASTM A 653, G60 (ASTM A 653M, Z180) hot-dip galvanized coating for framing where indicated.
- G. Steel Studs for Furring Channels: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch- (5-mm-) wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
 - 1. Thickness: 0.0179 inch (0.455 mm), unless otherwise indicated.
 - 2. Thickness: 0.0329 inch (0.836 mm), unless otherwise indicated.
 - 3. Thickness: As indicated.
 - 4. Depth: 1-5/8 inches (41.3 mm), unless otherwise indicated.
 - 5. Depth: 2-1/2 inches (63.5 mm), unless otherwise indicated.
 - 6. Depth: 3-5/8 inches (92.1 mm), unless otherwise indicated.
 - 7. Depth: As indicated.
 - 8. Protective Coating: ASTM A 653, G40 (ASTM A 653M, Z90) galvanized coating.
 - 9. Protective Coating: Manufacturer's standard corrosion-resistant coating.

2.3 STEEL STUDS AND RUNNERS

- A. General: Provide steel studs and runners complying with the following requirements:
 - 1. Protective Coating: ASTM A 653, G40 (ASTM A 653M, Z90) hot-dip galvanized coating.
 - 2. Protective Coating: Manufacturer's standard corrosion-resistant coating.
 - 3. Protective Coating: ASTM A 653, G40 (ASTM A 653M, Z90) hot-dip galvanized coating for framing members of exterior walls and within 10 feet (3 m) of exterior walls.
- B. Non-Load-Bearing Studs and Runners: ASTM C 645 and complying with the following requirements for minimum thickness of base (uncoated) metal and other characteristics:

1. Thickness: 0.0179 inch (0.455 mm).
2. Thickness: 0.0329 inch (0.836 mm).
3. Thickness: 0.0341 inch (0.866 mm).
4. Thickness: As indicated.
5. Depth: 1-5/8 inches (41.3 mm), unless otherwise indicated.
6. Depth: 2-1/2 inches (63.5 mm), unless otherwise indicated.
7. Depth: 3-5/8 inches (92.1 mm), unless otherwise indicated.
8. Depth: 4 inches (101.6 mm), unless otherwise indicated.
9. Depth: 6 inches (152.4 mm), unless otherwise indicated.
10. Depth: As indicated.

C. Load-Bearing Studs and Runners: ASTM C 955 and complying with the following requirements for structural-quality, zinc-coated (galvanized) steel sheet of grades indicated below, design thickness of base (uncoated) metal, and other dimensional characteristics:

1. System Performance: Provide studs and runners with a configuration and steel thickness capable of carrying the following transverse design loads, where indicated, without exceeding the allowable stress of steel or the following allowable design deflection:
 - a. Design Wind Load: 30 lbf/sq. ft. (1436 Pa) inward and outward.
 - b. Allowable Design Deflection: L/360.
2. Grade 33 (Grade 230) for thickness of 0.0329 inch (0.836 mm) or less.
3. Grade 40 (Grade 275) for thickness of 0.0428 inch (1.087 mm) or more.
4. Grade 50 (Grade 340) Class 1 for thickness of 0.0428 inch (1.087 mm) or more.
5. Thickness: 0.0359 inch (0.836 mm).
6. Thickness: 0.0428 inch (1.087 mm).
7. Thickness: 0.0538 inch (1.367 mm).
8. Thickness: 0.0677 inch (1.720 mm).
9. Thickness: 0.0966 inch (2.454 mm).
10. Thickness: As indicated.
11. Flange Width: 1-3/8 inches (34.9 mm).
12. Flange Width: 1-1/2 inches (38.1 mm).
13. Flange Width: 1-5/8 inches (41.3 mm).
14. Flange Width: 1-3/4 inches (44.5 mm).
15. Depth: 2-1/2 inches (63.5 mm), unless otherwise indicated.
16. Depth: 3-5/8 inches (92.1 mm), unless otherwise indicated.
17. Depth: 4 inches (101.6 mm), unless otherwise indicated.
18. Depth: 6 inches (152.4 mm), unless otherwise indicated.
19. Depth: 8 inches (203.2 mm), unless otherwise indicated.
20. Depth: As indicated.

2.4 VERTICAL METAL FURRING

A. General: Provide vertical furring complying with the following requirements:

1. Protective Coating: ASTM A 653, G40 (ASTM A 653M, Z90) hot-dip galvanized coating.
2. Protective Coating: Manufacturer's standard corrosion-resistant coating.
3. Protective Coating: ASTM A 653, G40 (ASTM A 653M, Z90) hot-dip galvanized coating for framing members attached to and within 10 feet (3 m) of exterior walls.

B. Channel Furring and Braces: Cold-rolled steel, minimum 0.0598-inch- (1.5-mm-) thick base (uncoated) metal and 3/4-inch- (19-mm-) deep-by-7/16-inch- (11.1-mm-) wide flanges, 300 lb/1000 feet (0.45 kg/m).

C. Hat Channels: Hat-shaped screwable furring channels, 7/8 inch (22.2 mm) deep, formed from zinc-coated (galvanized) steel sheet, minimum 0.0179 inch (0.455 mm) thick, Grade 33.

D. Z-Furring Members: Manufacturer's standard screw-type Z-shaped furring members formed from minimum 0.0179-inch- (0.455-mm-) thick, zinc-coated (galvanized) steel sheet designed for mechanical attachment of insulation boards or blankets to monolithic concrete and masonry walls.

E. Furring Brackets: Serrated-arm type, minimum 0.0329-inch- (0.836-mm-) thick base (uncoated) metal, adjustable from 1/4- to 2-1/4-inch (6.4- to 57.1-mm) wall clearance for channel furring.

2.5 PAPER BACKED LATH

- 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: Flat: for application to furred framing members.
 - 1) Weight: 2.5 lb/sq. yd. (1.4 kg/sq. m).
 - 2) Weight: 3.4 lb/sq. yd. (1.8 kg/sq. m).
 - b. Configuration: Self-furring: for application to flat substrates.
 - 1) Weight: 2.5 lb/sq. yd. (1.4 kg/sq. m).
 - 2) Weight: 3.4 lb/sq. yd. (1.8 kg/sq. m).
 3. Rib Lath: Comply with the following requirements:
 - a. Configuration: Flat, rib depth of not over 1/8 inch (3 mm).
 - 1) Weight: 2.75 lb/sq. yd. (1.5 kg/sq. m).
 - 2) Weight: 3.4 lb/sq. yd. (1.8 kg/sq. m).

2.6 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. Aluminum Components: Alloy, temper, and finish recommended by manufacturer with not less than the strength and durability properties of aluminum extrusions complying with ASTM B 221 (ASTM B 221M) for alloy and temper 6063-T5.
 2. Galvanized Steel Components: Fabricated from zinc-coated (galvanized) steel sheet complying with ASTM A 653, G40 (ASTM A 653M, Z90) minimum coating designation.
 3. Zinc-Alloy Components: ASTM B 69, 99 percent pure zinc.
 4. Plastic Components: ASTM D 4216, high-impact polyvinyl chloride (PVC) for building products.
- 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.
 2. PVC Plastic: Minimum 0.035 inch (0.89 mm) thick.
 3. Galvanized Steel: Minimum 0.0172 inch (0.44 mm) thick.
 4. Aluminum: Minimum 0.050 inch (1.2 mm) thick.
 5. Material: Any material above.
- D. Casing Beads: Square-edged style, with expanded flanges of the following material:
1. Zinc Alloy: Minimum 0.0207 inch (0.53 mm) thick.
 2. PVC Plastic: Minimum 0.035 inch (0.89 mm) thick.
 3. Galvanized Steel: Minimum 0.0172 inch (0.44 mm) thick.
 4. Aluminum: Minimum 0.050 inch (1.2 mm) thick.
 5. Material: Any material above.

- E. Curved Casing Beads: Square-edged style, fabricated from aluminum coated with clear plastic, preformed into curve of radius indicated.
- F. Control Joints: Prefabricated, of material and type indicated below:
 - 1. Zinc Alloy: Minimum 0.0207 inch (0.53 mm) thick.
 - 2. PVC Plastic: Minimum 0.035 inch (0.89 mm) thick.
 - 3. Galvanized Steel: Minimum 0.0172 inch (0.44 mm) thick.
 - 4. Aluminum: Minimum 0.050 inch (1.2 mm) thick.
 - 5. Material: Any material above.
 - 6. One-Piece Type: Folded pair of nonperforated screeds in M-shaped configuration, with expanded or perforated flanges.
 - 7. Two-Piece Type: Pair of casing beads with back flanges formed to provide slip-joint action, adjustable for joint widths from 1/8 to 5/8 inch (3 to 16 mm).
 - a. Provide removable protective tape on plaster face of control joints.
- G. Foundation Sill (Weep) Screed: Manufacturer's standard profile designed for use at sill plate line to form plaster stop and prevent plaster from contacting damp earth, fabricated from zinc-coated (galvanized) steel sheet.
- H. Lath Attachment Devices: Material and type required by ASTM C 1063 for installations indicated.

2.7 PLASTER MATERIALS

- A. Base-Coat Cements: Type as indicated below:
 - 1. Portland cement, ASTM C 150, Type I.
 - 2. Portland cement, ASTM C 150, Type II.
- B. Job-Mixed Finish-Coat Cement: Material and color as indicated below:
 - 1. Portland cement, ASTM C 150, Type I.
 - 2. Portland cement, ASTM C 150, Type II.
 - 3. Masonry cement, ASTM C 91, Type N.
 - 4. Plastic cement, ASTM C 150, Type I or II, except for limitations on insoluble residue, air entrainment, and additions subsequent to calcination and with maximum plasticizing agent content not exceeding 12 percent of total volume.
- C. Cement Color: White.
- D. Cement Color: Gray.
- E. Cement Color: Pigmented, factory-packaged standard product consisting of white or gray cement combined with colorfast mineral pigments.
 - 1. Provide color to match Architect's sample.
 - 2. Provide color selected by Architect from manufacturer's full range of colors.
- F. Stucco Finish Coat: Manufacturer's standard factory-packaged stucco, including portland cement, aggregate, coloring agent, and other proprietary ingredients.
- G. Acrylic-Based Finish Coat: Factory-mixed formulation of acrylic emulsion, colorfast mineral pigments, and fine aggregates specifically recommended by acrylic-based finish manufacturer for use over portland cement plaster base coats.
 - 1. Provide color selected by Architect from manufacturer's full range of colors.
 - 2. Provide 'custom' color created to match color provided by Architect.
- H. 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. Color as indicated, manufacturer's standard product consisting of white or gray cement combined with colorfast mineral pigments and aggregates selected for color.
 2. Provide color to match Architect's sample.
 3. Provide color selected by Architect from manufacturer's full range of colors.
- I. Lime: Special hydrated lime for finishing purposes, ASTM C 206, Type S; or special hydrated lime for masonry purposes, ASTM C 207, Type S.
- J. Sand Aggregate for Base Coats: ASTM C 897.
- K. Aggregate for Finish Coats: ASTM C 897 system and as indicated below:
1. Manufactured or natural sand, white in color.
 2. Manufactured or natural sand, in color matching Architect's sample.

2.8 MISCELLANEOUS MATERIALS

- A. Water for Mixing and Finishing Plaster: Potable.
- B. Acid-Etching Solution: Muriatic acid (10 percent solution of commercial hydrochloric acid) mixed 1 part to not less than 6 nor more than 10 parts water.
- C. Dash-Coat Material: 2 parts portland cement to 3 parts fine sand, mixed with water to a mushy-paste consistency.
- 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 1002 for fastening metal lath to wood or steel members less than 0.033 inch (0.84 mm) thick.
- F. 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.

2.9 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. 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.
 3. Scratch Coat: 1 part portland cement, 3/4 to 1-1/2 parts lime, 2-1/2 to 4 parts aggregate.
 4. Brown Coat: 1 part portland cement, 3/4 to 1-1/2 parts lime, 3 to 5 parts aggregate.
- D. 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.
 - b. 1 part portland cement, 1-1/2 to 2 parts lime, 3 parts sand.
- E. Factory-Prepared Finish Coats: Add water only; comply with finish coat manufacturer's written instructions.

- F. Stucco Finish Coat: Add water only; comply with stucco manufacturer's written instructions.
- G. Acrylic-Based Finish Coat: Apply material as factory packaged; do not add other ingredients; comply with manufacturer's written instructions.

2.10 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 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.

3.2 INSTALLATION OF CEILING SUSPENSION SYSTEMS

- A. Preparation and Coordination: Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure inserts and other structural anchorage provisions have been installed to receive ceiling hangers in a manner that will develop their full strength and at spacings required to support ceiling.
 - 1. Furnish concrete inserts, and other anchorage devices indicated, to other trades for installations well in advance of time needed for coordination with other work.
- B. Hanger Installation: Attach hangers to structure above ceiling to comply with ML/SFA 920, "Guide Specifications for Metal Lathing and Furring," and with referenced standards.
 - 1. Do not attach hangers to metal deck tabs.
- C. Install ceiling suspension system components of sizes and spacings indicated, but not in smaller sizes or greater spacings than those required by referenced lathing and furring installation standards.
 - 1. Wire Hangers: Space 0.16-inch- (4-mm-) diameter wire hangers not over 48 inches (1219 mm) o.c., parallel with and not over 36 inches (914 mm) perpendicular to direction of carrying channels, unless otherwise indicated, and within 6 inches (152 mm) of carrying channel ends.
 - 2. Carrying Channels: Space carrying channels not over 36 inches (914 mm) o.c. with 48-inch (1219-mm) o.c. hanger spacing.
 - 3. Furring Channels to Receive Metal Lath: Space furring channels not over 16 inches (406 mm) o.c. for 3.4-lb/sq. yd. (1.8-kg/sq. m) diamond-mesh lath, 19 inches (483 mm) o.c. for 3.4-lb/sq. yd. (1.8-kg/sq. m) flat rib lath, or 24 inches (609 mm) o.c. for 3.4-lb/sq. yd. (1.8-kg/sq. m), 3/8-inch (9.5-mm) rib lath.

3.3 INSTALLATION OF STEEL STUD WALL AND PARTITION SUPPORT SYSTEMS

- A. General: Install components of systems to comply with written instructions of steel stud manufacturer for applications indicated and as follows:
 - 1. For non-load-bearing stud systems, comply with ASTM C 754.
 - 2. For load-bearing stud systems, comply with ASTM C 1007 and as indicated.
- B. Steel Stud Systems to Receive Metal Lath: Comply with requirements of ML/SFA 920, "Guide Specifications for Metal Lathing and Furring," applicable to each installation condition and type of metal stud system indicated.
 - 1. Extend and attach partition support systems to structure above suspended ceilings, unless otherwise indicated.
 - 2. Extend partition support systems to finish ceilings and attach to ceiling suspension members, unless otherwise indicated.

3.4 INSTALLATION OF VERTICAL METAL FURRING

- A. Install vertical metal furring components of sizes and spacings indicated, but not in smaller sizes or greater spacings than those required by referenced ML/SFA standard.
- B. For furring on interior side of exterior walls, provide furring brackets, unless otherwise indicated.
- C. Metal Furring to Receive Metal Lath: Comply with requirements of ML/SFA 920, "Guide Specifications for Metal Lathing and Furring," applicable to each installation condition indicated.
- D. Z-Furring with Thermal Insulation: Erect thermal insulation vertically and hold in place with Z-furring members spaced 24 inches (609 mm) o.c. Except at external corners, securely attach narrow flanges of furring members to wall with concrete stub nails or powder-driven fasteners spaced 24 inches (609 mm) o.c. At external corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with standard-width insulation panel and continue in regular manner. At internal corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit. Until plaster base is installed, hold insulation in place with 10-inch- (254-mm-) long staples fabricated from 0.04-inch (1-mm) tie wire and inserted through slot in web of member.

3.5 LATHING

- A. Install paper backed metal lath for the following applications where plaster base coats are required. Provide appropriate type, configuration, and weight of metal lath selected from materials indicated that comply with referenced ML/SFA specifications and ASTM lathing installation standards.
 - 1. Suspended and furred ceilings using 3.4-lb/sq. yd. (1.8-kg/sq. m) minimum weight, diamond-mesh lath.
 - 2. Vertical metal framing and furring using 3.4-lb/sq. yd. (1.8-kg/sq. m) minimum weight, diamond-mesh lath and cold-rolled channel stud framing.
 - 3. Ceramic-tile setting beds using 3.4-lb/sq. yd. (1.8-kg/sq. m) minimum weight, diamond-mesh lath.
 - 4. Exterior sheathed wall surfaces using 3.4-lb/sq. yd. (1.8-kg/sq. m) minimum weight, self-furring, diamond-mesh lath.
 - 5. Exterior sheathed wall surfaces using woven-wire lath with 1-1/2-inch (38-mm) hexagonal-shaped mesh with minimum 0.0510-inch- (1.3-mm-) diameter, galvanized steel wire.
 - 6. Monolithic surfaces using 3.4-lb/sq. yd. (1.8-kg/sq. m) minimum weight, self-furring, diamond-mesh lath or vertical metal framing and furring as required for plaster thickness.

3.6 PREPARATIONS FOR PLASTERING

- A. Clean plaster bases and substrates for direct application of plaster, removing loose material and substances that may impair the Work.
- B. Etch concrete and concrete unit masonry surfaces indicated for direct plaster application. Scrub with acid-etching solution on previously wetted surface and rinse thoroughly with clean water. Repeat application,

if necessary, to obtain adequate suction and mechanical bond of plaster (where dash coat, bonding agent, or additive is not used).

- C. Apply bonding agent on concrete and concrete unit masonry surfaces indicated for direct plaster application; comply with manufacturer's written instructions for application.
- D. Apply dash coat on concrete surfaces indicated for direct plaster application. Moist-cure dash coat for at least 24 hours after application and before plastering.
- E. Install temporary grounds and screeds to ensure accurate rodding of plaster to true surfaces; coordinate with scratch-coat work.
- F. Refer to Division 6 Sections for installing permanent wood grounds, if any.
- G. Flashing: Refer to Division 7 Sections for installing flashing as indicated.

3.7 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. External Corners: Install corner reinforcement at external corners.
 - 2. External Corners: Bend lath around external angles without using cornerbeads or reinforcement.
 - 3. Terminations of Plaster: Install casing beads, unless otherwise indicated.
 - 4. Control Joints: Install at locations indicated or, if not indicated, at locations complying with the following criteria and approved by Architect:
 - a. Where an expansion or contraction joint occurs in surface of construction directly behind plaster membrane.
 - b. Distance between Control Joints: Not to exceed 18 feet (5.4 m) in either direction or a length-to-width ratio of 2-1/2 to 1.
 - c. Wall Areas: Not more than 144 sq. ft. (13 sq. m).
 - d. Horizontal Surfaces: Not more than 100 sq. ft. (9 sq. m) in area.
 - e. Where plaster panel sizes or dimensions change, extend joints full width or height of plaster membrane.

3.8 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. Grout hollow-metal frames, bases, and similar work occurring in plastered areas, with base-coat plaster material, and before lathing where necessary. Except where full grouting is indicated or required for fire-resistance rating, grout at least 6 inches (152 mm) at each jamb anchor.
- F. Sequence plaster application with installation and protection of other work so that neither will be damaged by installation of other.
- G. Plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground, unless otherwise indicated. Where interior plaster is not terminated at metal frame by casing beads, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
- H. 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.

- I. Number of Coats: Apply plaster of composition indicated, to comply with the following requirements:
 - 1. Three Coats: Over the following plaster base:
 - a. Metal lath.
 - 2. Two Coats: Over the following plaster bases:
 - a. Concrete unit masonry.
 - b. Concrete, cast-in-place or precast when surface condition complies with ASTM C 926 for plaster bonded to solid base.
- J. Finish Coats: Apply finish coats to comply with the following requirements:
 - 1. Float 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 fine-textured finish matching Architect's sample.
 - 2. Trowel-Textured Finish: Apply finish coat with hand-troweled-textured finish matching Architect's sample.
 - 3. Dash Finish: Machine-apply finish-coat plaster in 2 coats evenly and uniformly to produce textured finish matching Architect's sample.
 - 4. Prepared Finish: Apply stucco finish coats, acrylic-based finish coats, and other factory-prepared finish coats according to manufacturer's written instructions.
- K. 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."

3.9 CUTTING AND PATCHING

- A. Cut, patch, replace, repair, and point up plaster as necessary to accommodate other work. Repair cracks and indented surfaces. Point-up finish plaster surfaces around items that are built into or penetrate plaster surfaces. Repair or replace work to eliminate blisters, buckles, check cracking, dry outs, efflorescence, excessive pinholes, and similar defects. Repair or replace work as necessary to comply with required visual effects.

3.10 CLEANING AND PROTECTING

- A. Remove temporary covering and other provisions made to minimize spattering of plaster on other work. Promptly remove plaster from door frames, windows, and other 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, that ensure plaster work is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09220

SECTION 09255 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Nonload-bearing steel framing members for gypsum board assemblies.
 - 2. Gypsum board assemblies attached to steel framing.
 - 3. Cementitious backer units installed with gypsum board assemblies.
 - 4. Glass-mat, water-resistant gypsum backing board installed with gypsum board assemblies.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 5 Section "Cold-Formed Metal Framing" for load-bearing steel framing.
 - 2. Division 9 Section "Gypsum Board Shaft-Wall Assemblies" for framing, gypsum panels, and other components forming shaft wall assemblies.
 - 3. Division 9 Section "Gypsum Sheathing" for installations over steel framing.
 - 4. Division 9 Section "Tile" for cementitious backer units installed as substrates for ceramic tile.

1.3 ASSEMBLY PERFORMANCE REQUIREMENTS

- A. Fire Resistance: Provide gypsum board assemblies with fire-resistance ratings indicated.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.
- B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
- C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.
- D. Fire-Test-Response Characteristics: Where fire-resistance-rated gypsum board assemblies are indicated, provide gypsum board assemblies that comply with the following requirements:

1. Fire-Resistance Ratings: As indicated by GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.
2. Gypsum board assemblies indicated are identical to assemblies tested for fire resistance according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

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

1.7 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.
- B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F. For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F for 48 hours before application and continuously after until dry. Do not exceed 95 deg F when using temporary heat sources.
- C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 1. Steel Framing and Furring:
 - a. Clark Steel Framing, Inc.
 - b. Dale Industries, Inc.
 - c. National Gypsum Co.; Gold Bond Building Products Division.
 - d. Unimast, Inc.
 2. Grid Suspension Assemblies:
 - a. Armstrong World Industries, Inc.
 - b. Chicago Metallic Corp.
 - c. USG Interiors, Inc.
 3. Gypsum Board and Related Products:
 - a. Georgia-Pacific Corp.
 - b. National Gypsum Co.; Gold Bond Building Products Division.

- c. United States Gypsum Co.
- d. NELCO Worldwide

B. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work where proprietary gypsum wallboard is indicated include, but are not limited to, the following:

- 1. Firestop Type C; Georgia-Pacific Corp.
- 2. Fire-Shield G; National Gypsum Co.; Gold Bond Building Products Division.
- 3. SHEETROCK Brand Gypsum Panels, FIRECODE C Core; United States Gypsum Co.
- 4. Lead Lined Drywall

2.2 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS

A. General: Provide components complying with ASTM C 754 for conditions indicated.

B. Wire Ties: ASTM A 641 (ASTM A 641M), Class 1 zinc coating, soft temper, 0.062 inch thick.

C. Wire Hangers: ASTM A 641 (ASTM A 641M), Class 1 zinc coating, soft temper, 0.162-inch diameter.

D. Channels: Cold-rolled steel, 0.0598-inch minimum thickness of base (uncoated) metal and 7/16-inch- (11.1-mm-) wide flanges, and as follows:

- 1. Carrying Channels: 2 inches deep, 590 lb/1000 feet (88 kg/100 m), unless otherwise indicated.
- 2. Furring Channels: 3/4 inch deep, 300 lb/1000 feet, unless otherwise indicated.
- 3. Finish: ASTM A 653, G 60 (ASTM A 653M, Z 180) hot-dip galvanized coating for framing for exterior soffits and where indicated.

E. Steel Rigid Furring Channels: ASTM C 645, hat shaped, depth of 7/8 inch, and minimum thickness of base (uncoated) metal as follows:

- 1. Thickness: 0.0329 inch (0.84 mm), unless otherwise indicated.
- 2. Protective Coating: ASTM A 653, G 40 (ASTM A 653M, Z 90) hot-dip galvanized coating.

2.3 STEEL FRAMING FOR WALLS AND PARTITIONS

A. General: Provide steel framing members complying with the following requirements:

- 1. Protective Coating: Manufacturer's standard corrosion-resistant coating.

B. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch- wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:

- 1. Thickness: 0.027 inch where indicated.
 - a. For head runner, sill runner, jamb, and cripple studs at door and other openings.
- 2. Depth: 3-5/8 inches unless otherwise indicated.
- 3. Depth: 6 inches where indicated.
- 4. Depth: 4 inches where indicated.
- 5. Depth: 2-1/2 inches where indicated.
- 6. Depth: 1-5/8 inch where indicated.

C. Deflection Track: Manufacturer's standard top runner designed to prevent cracking of gypsum board applied to interior partitions resulting from deflection of the structure above fabricated from steel sheet complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M).

- D. Steel Rigid Furring Channels: ASTM C 645, hat shaped, depth and minimum thickness of base (uncoated) metal as follows:
 - 1. Thickness: 0.0179 inch, unless otherwise indicated.
 - 2. Depth: 1-1/2 inch.
- E. Furring Brackets: Serrated-arm type, adjustable, fabricated from corrosion-resistant steel sheet complying with ASTM C 645, minimum thickness of base (uncoated) metal of 0.0329 inch (0.84 mm), designed for screw attachment to steel studs and steel rigid furring channels used for furring.
- F. Steel Channel Bridging: Cold-rolled steel, 0.0598-inch minimum thickness of base (uncoated) metal and 7/16-inch-wide flanges, 1-1/2 inches deep, 475 lb/1000 feet, unless otherwise indicated.
- G. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

2.4 GYPSUM BOARD PRODUCTS

- A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.
 - 1. Widths: Provide gypsum board in widths of 48 inches.
- B. Gypsum Wallboard: ASTM C 36 and as follows:
 - 1. Type: Type X where required for fire-resistance-rated assemblies.
 - 2. Edges: Tapered.
 - 3. Thickness: 5/8 inch where indicated.
- C. Gypsum Board Base Layer(s) for Multilayer Applications: Gypsum wallboard, ASTM C 36, and as follows:
 - 1. Type: Type X where indicated or required for fire-resistance-rated assemblies.
 - 2. Edges: Square, nontapered.
 - 3. Thickness: 5/8 inch where indicated.
- D. Water-Resistant Gypsum Backing Board: ASTM C 630 and as follows:
 - 1. Type: Regular, unless otherwise indicated.
 - 2. Thickness: 5/8 inch, unless otherwise indicated.
- E. Lead Lined Drywall (x-ray room)" 1/16" thick lead UL Classification NELCO-R20718 or equal

LEAD-LINED GYPSUM

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. The BIDDING REQUIREMENTS, CONTRACT FORMS, and CONTRACT CONDITIONS as listed in the Table of Contents, and applicable parts of Division 1 - GENERAL REQUIREMENTS, shall be included in and made a part of this Section.
- B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section.

1.2 SUMMARY

- A. The work of this Section consists of lead-lined gypsum board where shown on the Drawings, as specified herein, and as required for a complete and proper installation. Work includes, but is not limited to the following:
 - 1. Furnish and install the following:
 - a. Lead-lined gypsum board.
 - b. Lead batten strips, ribbons, disks, and tabs as required for a complete installation.
 - 2. Daily and final cleaning of Work of this Section.

1.3 RELATED SECTIONS

- A. Section 01 73 00 - EXECUTION: Administrative and procedure requirements for final cleaning and waste management.
- B. Section 09 22 16 - NON-STRUCTURAL METAL FRAMING: Metal support framing for lead-lined gypsum board.
- C. Section 09 29 00 - GYPSUM BOARD:
 - 1. Application of joint treatment, edging, casings, and trim pieces.
 - 2. Taping and finishing of joints in lead-lined and standard gypsum wallboard partitions.
 - 3. Application of acoustical sealant.
- D. Section 09 91 00 - PAINTING: Field-applied prime and finish coatings.
- E. Division 23 - HEATING, VENTILATING AND AIR CONDITIONING: Supply and return air registers.
- F. Division 26 - ELECTRICAL: Electrical boxes and receptacles.

1.4 REFERENCES

- A. Comply with applicable requirements of the following standards and those others referenced in this Section.
 - 1. American Conference of Government Industrial Hygienists – Industrial Ventilation Manual.
 - 2. American Society for Testing and Materials (ASTM):
 - a. ASTM B 29 – Standard Specification for Refined Lead.

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- b. ASTM C 1002 – Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - c. ASTM C 1396 – Standard Specification for Gypsum Board.
 - d. ASTM E 90 – Method of Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
 - e. ASTM E 119 – Fire Tests of Building Construction and Materials.
3. Gypsum Association (GA):
 - a. GA 201 – Gypsum Board for Walls and Ceilings.
 - b. GA 216 – Recommended Specifications for the Application and Finishing of Gypsum Board.
 4. International Organization for Standardization (ISO): ISO 9001:2008.
 5. National Council on Radiation Protection and Measurements (NCRP):
 - a. NCRP Report No. 144 – Radiation Protection for Particle Accelerator Facilities.
 - b. NCRP Report No. 145 – Radiation Protection in Dentistry.
 - c. NCRP Report No. 147 – Structural Shielding for Medical X-Ray Imaging Facilities.
 - d. NCRP Report No. 148 – Radiation Protection in Veterinary Medicine.
 - e. NCRP Report No. 151 – Structural Shielding Design and Evaluation for Megavoltage X- and Gamma Ray Radiotherapy Facilities.
 6. U.S. Department of Labor Occupational Safety and Health Administration (OSHA):
 - a. OSHA standard 29 CFR 1910.1025 – Lead.
 - b. OSHA standard 29 CFR 1926 – Safety and Health Regulations for Construction.
 - c. OSHA standard 29 CFR 1926.62 – Lead.
 - d. CAL-OSHA Title 8 Sec 1532.1, Sec 5198, and Sec 5216
 7. All applicable federal, state, and municipal codes, laws, and regulations for fire-rated assemblies.

1.5 SUBMITTALS

- A. Submit the following under provisions of Section 01 33 00 - SUBMITTAL PROCEDURES:
 1. Literature: Product data on lead-lined gypsum board products, performance data, physical properties, and installation instructions for each item furnished hereunder.
 - a. Include material characteristics, size limitations, and special application requirements.
 - b. Recycled material content: Indicate recycled content and provide manufacturer's written certification of recycled steel and lead products (LEED™ NC Version 2.2, MR Credits 4.1 and 4.2).
 - 1) Indicate percentage both post-consumer and pre-consumer recycled content per unit of gypsum board and lead products.
 - c. Local / regional materials (LEED™ NC Version 2.2, MR Credit 5.1):
 - 1) Indicate location of extraction, harvesting, and recovery; indicate the distance between extraction, harvesting, and recovery and the project site.
 - 2) Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.

- d. Include certification of data indicating Volatile Organic Compound (VOC) content of all field-applied adhesives. Submit MSDS highlighting VOC limits. (LEED™ NC Version 2.2, EQ Credit 4.1)
- 2. Certifications:
 - a. Manufacturer's written certification stating that lead-lined gypsum board systems and all related items to be furnished hereunder, meet or exceed the requirements specified under this Section and are in compliance with Physicist of Record report(s), and that the applicator is qualified and approved to install the materials in accordance with manufacturer's product data.
 - b. Installer certifications for OSHA 29 CFR 1926.
- 3. Shop drawings: Manufacturer's standard design details of critical intersections within assemblies and complete installation details where gypsum board shielding will interface with work of other sections.
- B. Submit the following under provisions of Section 01 78 00 - CLOSEOUT SUBMITTALS.
 - 1. Manufacturer's ISO 9001:2008 field quality control reports of field inspections, including manufacturer's final punch list.
 - 2. Manufacturer's warranties: Include coverage of installation for compliance with shielding requirements based on Physicist of Record report(s).

1.6 QUALITY ASSURANCE

- A. Notify the Architect where conflicts apply between referenced standards and existing materials, and existing methods of construction.
- B. Installers:
 - 1. Installers, foreman, and job supervisors for the Work of this Section shall be trained by, and approved by, product manufacturer. Foreman and job supervisors shall be certified by manufacturer to have not less than 5 years experience in the installation of neutron / radiation shielding.
 - 2. All construction workers, foreman, and job supervisors for the work of this section shall have a minimum certification of 10 hours of OSHA training in occupational safety and health.

1.7 DELIVER, STORAGE AND HANDLING

- A. Do not deliver items to the site, until all specified submittals have been submitted to, and approved by, the Architect. Do not deliver items to the site, until facility is enclosed, weather-tight, and an ambient temperature above 50 degrees Fahrenheit can be maintained by General Contractor.
- B. Deliver lead-lined gypsum board on pallets, with tops and sides fully protected, and shrink-wrapped with polymer plastic film. Clearly identify brand name, identification, and address of manufacturer or supplier.
- C. General Contractor is responsible to store materials inside, under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion, and damage from construction traffic and other causes.
 - 1. Neatly stack board materials flat to prevent sagging.
 - 2. Store sheets a minimum of 3 inches above concrete floor slabs.

3. Cover lead-lined gypsum board with a polyethylene vapor retarder.
- D. Handle board materials so to prevent damage to edges, ends, and surfaces.
 1. Avoid breaking adhesive bond between lead sheets and gypsum board.
- E. Provide protection against contamination during handling, storage, and installation procedures.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. General Contractor is fully responsible, maintain ambient temperature above 50 degrees Fahrenheit for 24 hours before, during, and 48 hours after installation of lead-lined gypsum board assemblies.

1.9 SEQUENCING AND SCHEDULING

- A. Coordinate the work of this Section with the respective trades responsible for installing interfacing work, and ensure that the work performed hereunder is acceptable to such trades for the installation of their work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Specified Manufacturer: To establish a standard of quality, design, and function, desired drawings and specifications have been based on "Lead-Lined Gypsum" as manufactured by NELCO, 2 Burlington Woods Dr, Suite 300, Woburn, MA 01803, www.nelcoworldwide.com (telephone 800-635-2613).
 1. Manufacturing Facilities:
 - a. NELCO Boston: 3 Gill St - Unit D, Woburn, MA 01801
 - b. NELCO Houston: 4600 Homestead Road, Houston, TX 77028
 - c. NELCO San Francisco: 1840 Williams Street, San Leandro, CA 94577
- B. Alternative products (substitutions): Contractor must furnish appropriate and complete product data, proof of ISO 9001:2008 certification, worker OSHA certifications, environmental characteristics, and sample warranty with bid for the Architect to consider the substitutions as "equal" to the manufacturer, product specified and quality assurance requirements. Further additional information may be requested by the Architect for determination that the proposed product substitution is fully equal to the specified products. There is no guarantee that proposed substitutions will be approved, and the Contractor is hereby directed not to order any materials until said approval(s) are received in writing.
 1. Requesting substitutions is at the Contractor's own risk, with regard to uncompensated delays of the Project. Time is required for sufficient review and for additional requests of information. Delays of work which result from substitution reviews and resubmissions are not grounds for additional time or cost change orders, and will not be considered by the Owner.

2.2 MATERIALS

- A. General Sustainability Requirements: Use maximum available percentage of recycled materials but not less than that required to meet LEED™ Credit MR 5.2
 1. Gypsum Board: Gypsum board products incorporated into the work shall contain not less than 50 percent of recycled materials.

2. Lead Backing: Lead sheet incorporated into the work shall contain not less than 90 percent of post-consumer recycled materials.

B. Lead-lined gypsum board

Note to Specifier. SELECT GYPSUM BOARD TYPE(S)

1. Gypsum board: UL fire resistance rated, ASTM C 36 'Type X' board, 5/8 inch [15.9mm] thick, except where 1/2 inch thickness is indicated on Drawings, of lengths to minimize end joints, with tapered edges, and enhanced core.
2. Sag-resistant gypsum board ceiling panels: non-rated 1/2 inch [12.7mm] thick, 48 inch width, of lengths to minimize end joints, with tapered edges, conforming to ASTM C 36, ASTM C 1395 and ASTM C 1396.
3. Moisture resistant (MR) gypsum board (green board), fire resistant: Conforming to ASTM C630 and C1396, with Type "X" core 5/8 inch [15.9mm] thick, 48 inch width, of lengths to minimize end joints, with tapered edges.
4. "Paperless" moisture resistant board: 5/8 inch [15.9mm] thick Glass mat, water-resistant, mold-resistant interior wall panel: Coated inorganic glass mat-faced, with Type "X" water-resistant, treated core gypsum wallboard. Physical properties conforming to the applicable sections of ASTM C 1177, and ASTM C 630.
5. Plaster base (blue board): UL fire resistance rated, Type X board 5/8 inch [15.9mm] thick, except as otherwise indicated on the Drawings, of lengths to minimize end joints.
6. Lead sheet: Conforming to ASTM B 29 in uniform thickness(es) as required by Physicist of Record report(s).

Note to Specifier. SELECT LEAD LINING THICKNESS(ES) REQUIRED

7. Thickness: 1/32 inch [0.79mm] (nominal 2 lbs. per square foot) lead sheet to 1/8 inch [3.17mm] (nominal 8 lbs. per square foot) lead sheet.

2.3 ACCESSORIES

- A. Lead Batten Strips (Ribbon Lead): lead strips, free from any imperfections, conforming to ASTM B 29, having same thickness as lead lining on gypsum board. Provide 2 inch [50mm] wide lead strips for straight runs and 3 inch [76mm] wide lead strips at corners.
- B. Fastener Protection: The following two options are acceptable.
 - a. Lead Disc to meet shielding requirements, conforming to ASTM B 29, for installation over gypsum board fastener heads.
 - b. Lead Tabs to meet shielding requirements, conforming to ASTM B 29, for installation over gypsum board fastener heads.
- C. Lead Lining at Electrical Boxes, Medical Gas Penetrations, and Similar Conditions shall be shielded with the same thickness and the lead walls.

Note to Specifier. SELECT APPROPRIATE FASTENER TYPE

- D. Fasteners: Type S, bugle head screws complying with ASTM C 1002, not less than 1 inch [25mm] length for applying lead-lined gypsum board to non-structural metal framing.

- E. Fasteners: Type S-6 or greater fine thread rust resistant self-drilling screws complying with ASTM C 1002, not less than 1-1/4 inch [31mm] length, for applying lead-lined gypsum board to light gage metal framing having thickness of 0.033 to 0.112 inch [0.84 to 2.84 mm] thick.
- F. Fasteners: Type W, bugle head screws complying with ASTM C 1002, not less than 1-1/4 inch [31mm] length for applying lead-lined gypsum board to wood framing and furring.

2.4 FABRICATION

- A. Lead lining: Un-pierced lead permanently laminated to gypsum board in factory using manufacturer's recommended resilient latex adhesive.

2.5 SOURCE QUALITY CONTROL

- A. Obtain lead accessories and lead-lined gypsum board products from a single ISO 9001: 2008 certified manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that all items which are to be enclosed by Work of this Section have been permanently installed, inspected, and approved.
- B. Inspect framing and other substrates; verify that they are in proper condition to receive the work of this Section.

3.2 PREPARATION

- A. During the operation of work of this Section, protect existing work against damage by the exercise of reasonable care and precautions. Repair all existing materials which are damaged by Work of this Section, to match original profiles and finishes. Existing materials repaired shall be removed and replaced with new work to match existing.

3.3 INSTALLATION - GENERAL

- A. General: Perform erection procedures for the various gypsum board system conditions, except as otherwise specified, as set forth in GA 201, GA 216, the written instructions of manufacturer, together with the additional requirements specified herein and as indicated on the Drawings.
- B. Where fire-resistive rated assemblies are indicated, erect gypsum board systems in strict accordance with the manufacturers' UL listed test constructions for the required fire rating on each specific assembly.

3.4 INSTALLATION OF LEAD-LINED GYPSUM BOARD

- A. Prior to installation of lead-lined gypsum board:
 1. Install 2 inch [50mm] wide lead battens at all vertical stud framing (and ceiling joists). At corner intersections of walls (and ceilings) provide 3 inch [75mm] wide battens or, if framing allows, corner lapping of lead-lined gypsum board.
 2. Install lead lining at all electrical outlet boxes, medical gas boxes, and similar penetrations occurring in gypsum board.
 3. Make provisions for connection with lead-lined doorframes and cutouts for vision panels.

LEAD-LINED GYPSUM

4. Install screw tabs on studs where required.
- B. Screw-fasten boards to framing and furring, with ends and edges occurring over firm bearing. Screw fasten lead-lined gypsum panels 8 inches [200mm] on center at panel edges and 12 inches [300mm] on center to intermediate framing members.
 1. Erect all lead-lined gypsum board vertically on wall surfaces. Install boards horizontally where required by code.
 2. Erect ceiling gypsum boards to meet UL requirements, where applicable, stagger end joints over supports. Secure gypsum board with fasteners inserted through ceiling buttons; anchor fasteners directly to framing or suspended support system.
 3. Recess gypsum board screws slightly into board surface and cap.
- C. Wherever items penetrate the gypsum board surfaces, use extra care in cutting the gypsum board to ensure a uniformly dimensioned joint between the penetrating item and the gypsum board. Verify the expected deflection factor of the penetrating members, and cut the gypsum accordingly, to prevent damage thereto from the deflecting members.

3.5 TOLERANCES

- A. Maximum variation for gypsum board partitions and ceilings from true flatness: 1/8 inch [3mm] per 10 feet [3 m], noncumulative.

3.6 FIELD QUALITY CONTROL

- A. Field inspection and physicist testing to be performed under separate contract with Owner.

3.7 CLEANING

- A. General: Clean work under provisions of Section 01 73 00 - EXECUTION.
 1. Upon completion of the work of this Section in any given area, remove tools, equipment and all rubbish and debris from the work area.
- B. Daily clean work areas by disposing of debris, scraps, and lead. Vacuum floor surfaces with HEPA (High Efficiency Particulate Air filter) vacuum in compliance with OSHA Standard 1926.62.
- C. After completion of the work of this Section, remove rubbish, tools and equipment, and clean all wall, partition, and floor areas free from deposits of lead, and other materials installed under this Section. Vacuum surfaces with HEPA vacuum in compliance with OSHA Standard 1926.62.

3.8 PROTECTION

- A. General Contractor is responsible to protect finished work under provisions of Section 01 50 00 - TEMPORARY FACILITIES AND CONTROLS.

End of Section

2.5 TRIM ACCESSORIES

- A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:
 - 1. Material: Formed metal or plastic, with metal complying with the following requirement:
 - a. Steel sheet zinc coated by hot-dip process or rolled zinc.
 - 2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
 - a. Cornerbead on outside corners, unless otherwise indicated.
 - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
 - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
 - d. One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

2.6 JOINT TREATMENT MATERIALS

- A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.
 - 1. Use pressure-sensitive or staple-attached, open-weave, glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.
- C. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
 - 1. Ready-Mixed Formulation: Factory-mixed product.
 - a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
 - b. Topping compound formulated for fill (second) and finish (third) coats.
 - c. All-purpose compound formulated for both taping and topping compounds.

2.7 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot-grouting hollow metal door frames.
- C. Steel drill screws complying with ASTM C 1002 for the following applications:
 - 1. Fastening gypsum board to steel members less than 0.033 inch thick.
 - 2. Fastening gypsum board to gypsum board.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Ceiling Anchorages: Coordinate installation of ceiling suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.
- B. Before sprayed-on fireproofing is applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed-on fireproofing. Where offset anchor plates are required, provide continuous units fastened to building structure not more than 24 inches o.c.

3.3 INSTALLING STEEL FRAMING, GENERAL

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

3.4 INSTALLING STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

- A. Suspend ceiling hangers from building structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
 - 3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.
 - 4. Secure flat, angle, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for structure as well as for type of hanger involved, and in a manner that will not cause them to deteriorate or otherwise fail.
 - 5. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 6. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- B. Install suspended steel framing components in sizes and at spacings indicated, but not less than that required by the referenced steel framing installation standard.

1. Wire Hangers: 48 inches o.c.
 2. Carrying Channels (Main Runners): 48 inches o.c.
 3. Furring Channels (Furring Members): 24 inches o.c.
- C. Installation Tolerances: Install steel framing components for suspended ceilings so that cross-furring or grid suspension members are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) as measured both lengthwise on each member and transversely between parallel members.
- D. Wire-tie or clip furring members to main runners and to other structural supports as indicated.

3.5 INSTALLING STEEL FRAMING FOR WALLS AND PARTITIONS

- A. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.
- B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8 inch from the plane formed by the faces of adjacent framing.
- C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
1. Cut studs 1/2 inch short of full height to provide perimeter relief.
 2. For STC-rated and fire-resistance-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid structural surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.
- D. Terminate partition framing at suspended ceilings where indicated.
- E. Install steel studs and furring in sizes and at spacings indicated.
1. Single-Layer Construction: Space studs 16 inches o.c., unless otherwise indicated.
 2. Multilayer Construction: Space studs 16 inches o.c., unless otherwise indicated.
- F. Install steel studs so flanges point in the same direction and leading edge or end of each gypsum board panel can be attached to open (unsupported) edges of stud flanges first.
- G. Frame door openings to comply with GA-219, and with applicable published recommendations of gypsum board manufacturer, unless otherwise indicated. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
1. Install 2 studs at each jamb, unless otherwise indicated.
 2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint.
- H. Frame openings other than door openings to comply with details indicated or, if none indicated, as required for door openings. Install framing below sills of openings to match framing required above door heads.

3.6 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

- A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.

- B. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. 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 both edge or 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. Avoid joints other than control joints at corners of framed openings where possible.
- E. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- F. Attach gypsum panels to framing provided at openings and cutouts.
- G. Spot grout hollow metal door frames for solid-core wood doors, hollow metal doors, and doors over 32 inches wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.
- H. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.
- I. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases that are braced internally.
 - 1. Except where 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.
- J. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- K. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.7 GYPSUM BOARD APPLICATION METHODS

- A. Single-Layer Application: Install gypsum wallboard panels as follows:
 - 1. On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless parallel application is required for fire-resistance-rated assemblies. Use maximum-length panels to minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
 - b. At stairwells and other high walls, install panels horizontally.
- B. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and gypsum wallboard 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. Stagger joints on opposite sides of partitions.

- C. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:
 - 1. Fasten with screws.
- D. Multilayer Fastening Methods: Apply base layers of gypsum panels and face layer to base layers as follows:
 - 1. Fasten both base layers and face layers separately to supports with screws.

3.8 INSTALLING TRIM ACCESSORIES

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
- B. Install cornerbead at external corners.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.
 - 1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
 - 2. Install L-bead where edge trim can only be installed after gypsum panels are installed.
- D. Install control joints according to ASTM C 840 and manufacturer's recommendations and in specific locations approved by Architect for visual effect.

3.9 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.
- B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints, except those with trim accessories having flanges not requiring tape.
- D. Apply joint tape over gypsum board joints and to flanges of trim accessories as recommended by trim accessory manufacturer.
- E. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
 - 1. Level 1 for ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
 - 2. Level 3 for gypsum board where indicated.
- F. Use one of the following joint compound combinations as applicable to the finish levels specified:
- G. Use the following joint compound combination as applicable to the finish levels specified:
 - 1. Embedding and First Coat: Job-mixed, drying-type, all-purpose compound. Fill (Second) Coat: Job-mixed, drying-type, all-purpose compound. Finish (Third) Coat: Job-mixed, drying-type, all-purpose compound.
- H. Where Level 3 gypsum board finish is indicated, embed tape in joint compound and apply first and fill (second) coats of joint compound.

- I. Where Level 1 gypsum board finish is indicated, embed tape in joint compound.

3.10 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes according to texture finish manufacturer's instructions. Apply primer only to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish to gypsum panels and other surfaces indicated to receive texture finish according to texture finish manufacturer's directions. Using powered spray equipment, produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray as recommended by texture finish manufacturer to prevent damage.

3.11 FIELD QUALITY CONTROL

- A. Above-Ceiling Observation: Architect will conduct an above-ceiling observation prior to installation of gypsum board ceilings and report any deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.
 - 1. Notify Architect one week in advance of the date and the time when the Project, or part of the Project, will be ready for an above-ceiling observation.
 - 2. Prior to notifying Architect, complete the following in areas to receive gypsum board ceilings:
 - a. Installation of 80 percent of lighting fixtures, powered for operation.
 - b. Installation, insulation, and leak and pressure testing of water piping systems.
 - c. Installation of air duct systems.
 - d. Installation of air devices.
 - e. Installation of mechanical system control air tubing.
 - f. Installation of ceiling support framing.

3.12 CLEANING AND PROTECTION

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09255

SECTION 09310 - CERAMIC TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

- 1. Ceramic mosaic tile.
- 2. Glazed wall tile.
- 3. Waterproof membrane for thin-set tile installations.

- B. Related Sections include the following:

- 1. Division 3 Section "Cast-in-Place Concrete" for monolithic slab finishes specified for tile substrates.
- 2. Division 7 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
- 3. Division 9 Section "Gypsum Board Assemblies" for cementitious backer units installed in gypsum wallboard assemblies.

1.3 DEFINITIONS

- A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.
- B. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

1.4 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - 1. Level Surfaces: Minimum 0.6.

1.5 SUBMITTALS

- A. Product Data: For each type of tile, mortar, grout, and other products specified.
- B. Tile Samples for Initial Selection: Manufacturer's color charts consisting of actual tiles or sections of tiles showing the full range of colors, textures, and patterns available for each type and composition of tile indicated. Include Samples of accessories involving color selection.
- C. Grout Samples for Initial Selection: Manufacturer's color charts consisting of actual sections of grout showing the full range of colors available for each type of grout indicated.
- D. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

1.6 QUALITY ASSURANCE

- A. **Installer Qualifications:** Engage an experienced installer who has completed tile installations similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. **Source Limitations for Tile:** Obtain each color, grade, finish, type, composition, and variety of tile from one source with resources to provide products from the same production run for each contiguous area of consistent quality in appearance and physical properties without delaying the Work.
- C. **Source Limitations for Setting and Grouting Materials:** Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.
- B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

1.8 PROJECT CONDITIONS

- A. **Environmental Limitations:** Do not install tile until construction in spaces is completed and ambient temperature and humidity conditions are being maintained to comply with referenced standards and manufacturer's written instructions.

1.9 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. **Tile and Trim Units:** Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

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. **Tile Products:**
 - a. American Olean Tile Company.
 - b. Dal-Tile Corporation.
 - c. Florida Tile Industries, Inc.
 - d. KPT, Inc.
 - e. Lonestar Ceramics Company.
 - f. Quarry Tile Company.

2. Tile-Setting and -Grouting Materials:

- a. American Olean Tile Company.
- b. Dal-Tile Corporation.
- c. Mapei Corporation.
- d. TEC Incorporated.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
 1. Provide tile complying with Standard Grade requirements, unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting Materials" and "Grouting Materials" articles.
- C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
 1. Provide Architect's selections from manufacturer's full range of colors, textures, and patterns for products of type indicated.
- D. Factory Blending: For tile exhibiting color variations within the ranges selected during Sample submittals, blend tile in the factory and package so tile units taken from one package show the same range in colors as those taken from other packages and match approved Samples.

2.3 TILE PRODUCTS

- A. Glazed Interior Wall Tile: Provide flat tile complying with the following requirements:
 1. Module Size: 4-1/4 by 4-1/4 inches.
 2. Thickness: 5/16 inch.
 3. Face: Plain with cushion edges.
 4. Face: Pattern of design indicated, with manufacturer's standard edges.
 5. Color: Field + Accent (15%)
- B. Glazed Exterior Wall Tile: Provide flat tile complying with the following requirements:
 1. Module Size: 4-1/4 by 4-1/4 inches.
 2. Thickness: 5/16 inch.
 3. Face: Plain with cushion edges.
 4. Face: Pattern of design indicated, with manufacturer's standard edges.
 5. Color: Field + Accent (15%)
- C. Trim Units: Provide tile trim units to match characteristics of adjoining flat tile and to comply with the following requirements:
 1. Size: As indicated, coordinated with sizes and coursing of adjoining flat tile where applicable.
 2. Shapes: As follows, selected from manufacturer's standard shapes:
 - a. Base for Portland Cement Mortar Installations: Coved.
 - b. Base for Thin-Set Mortar Installations: Straight.
 - c. Wainscot Cap for Portland Cement Mortar Installations: Bullnose cap.

- d. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose.
 - e. External Corners for Portland Cement Mortar Installations: Bullnose shape with a radius of at least 3/4 inch, unless otherwise indicated.
 - f. External Corners for Thin-Set Mortar Installations: Surface bullnose.
 - g. Internal Corners: Field-buttet square corners, except with coved base and cap angle pieces designed to member with stretcher shapes.
 - h. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide a reduction in thickness from 1/2 to 1/4 inch across nominal 4-inch dimension.
- D. Accessories for Glazed Wall Tile: Provide vitreous china accessories of type and size indicated and in color and finish to match adjoining glazed wall tile.

2.4 WATERPROOFING FOR THIN-SET TILE INSTALLATIONS

- A. General: Provide products that comply with ANSI A118.10 and the descriptions in this Article.
- B. Polyethylene-Sheet Waterproofing: Manufacturer's standard proprietary product consisting of composite sheets, 60 inches wide by a nominal thickness of 0.030 inches, composed of an inner layer of nonplasticized, chlorinated polyethylene sheet faced on both sides with laminated, high-strength, nonwoven polyester material, designed for embedding in latex-portland cement mortar and as the substrate for latex-portland cement mortar setting bed.
- C. Available Products: Subject to compliance with requirements, products which may be incorporated into the Work include, but are not limited to, the following:
- 1. Acrylic-Latex Waterproofing:
 - a. PRP 315; Mapei Corporation.
 - b. Or approve equal.

2.5 SETTING MATERIALS

- A. Portland Cement Mortar Installation Materials: Provide materials complying with ANSI A108.1A and as specified below:
- 1. Latex additive (water emulsion) described below, serving as replacement for part or all of gaging water, of type specifically recommended by latex additive manufacturer for use with job-mixed portland cement and aggregate mortar bed.
 - a. Latex Additive: Manufacturer's standard.
- B. Dry-Set Portland Cement Mortar: ANSI A118.1.
- 1. For wall applications, provide nonsagging, latex-portland cement mortar complying with ANSI A118.4 for mortar of this type defined in Section F-2.1.2.
- C. Latex-Portland Cement Mortar: ANSI A118.4, composed as follows:
- 1. Mixture of Dry-Mortar Mix and Latex Additive: Mixture of prepackaged dry-mortar mix and liquid-latex additive complying with the following requirements:
 - a. Latex Additive: Acrylic resin.
 - b. For wall applications, provide nonsagging, latex-portland cement mortar complying with ANSI A118.4 for mortar of this type defined in Section F-2.1.2.

- D. Chemical-Resistant, Water-Cleanable, Ceramic Tile-Setting and -Grouting Epoxy: ANSI A118.3.
 - 1. Provide product capable of resisting continuous and intermittent exposure to temperatures of up to 140 deg F and 212 deg F, respectively, as certified by mortar manufacturer for intended use.
- E. Water-Cleanable, Tile-Setting Epoxy Adhesive: ANSI A118.3.

2.6 GROUTING MATERIALS

- A. Dry-Set Grout: ANSI A118.6, color as selected by Architect from full range of colors.
- B. Latex-Portland Cement Grout: ANSI A118.6 for materials described in Section H-2.4, composed as follows:
 - 1. Mixture of Dry-Grout Mix and Latex Additive: Mixture of factory-prepared, dry-grout mix and latex additive complying with the following requirements:
 - a. Sanded Dry-Grout Mix: Commercial portland cement grout complying with ANSI A118.6 for materials described in Section H-2.1, for joints 1/8 inch (3.2 mm) and wider.
 - b. Latex Additive: Acrylic resin.
- C. Chemical-Resistant Epoxy Grout: ANSI A118.3, color as indicated.
 - 1. Provide product capable of resisting continuous and intermittent exposure to temperatures of up to 140 deg F (60 deg C) and 212 deg F (100 deg C), respectively, as certified by mortar manufacturer for intended use.

2.7 ELASTOMERIC SEALANTS

- A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements of Division 7 Section "Joint Sealants."
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and temperature extremes.
- D. Available Products: Subject to compliance with requirements, products which may be incorporated into the Work include, but are not limited to, the following:
 - 1. One-Part, Mildew-Resistant Silicone Sealants:
 - a. Dow Corning 786; Dow Corning Corporation.
 - b. Sanitary 1700; GE Silicones.
 - c. Pecora 898 Sanitary Silicone Sealant; Pecora Corp.
 - d. Tremsil 600 White; Tremco, Inc.

2.8 MISCELLANEOUS MATERIALS

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

- B. Metal Edge Strips: White-zinc-alloy terrazzo strips, 1/8 inch (3.2 mm) wide at top edge with integral provision for anchorage to mortar bed or substrate, unless otherwise indicated.
- C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.9 MIXING MORTARS AND GROUT

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 series of tile installation standards for installations indicated.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust latter in consultation with Architect.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove coatings, including curing compounds, and other substances that contain soap, wax, oil, or silicone and are incompatible with tile-setting materials by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.
- B. Provide concrete substrates for tile floors installed with dry-set or latex-portland cement mortars that comply with flatness tolerances specified in referenced ANSI A108 series of tile installation standards for installations indicated.
 - 1. Use trowelable leveling and patching compounds per tile-setting material manufacturer's written instructions to fill cracks, holes, and depressions.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Blending: For tile exhibiting color variations within the ranges selected during Sample submittals, verify that tile has been blended in the factory and packaged so tile units taken from one package show the same range in colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 series of tile installation standards in "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are the same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets the same width as joints within tile sheets so joints between sheets are not apparent in finished work.
- F. Lay out tile wainscots to next full tile beyond dimensions indicated.
- G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
 - 2. Prepare joints and apply sealants to comply with requirements of Division 7 Section "Joint Sealants."
- H. Grout tile to comply with the requirements of the following tile installation standards:
 - 1. For ceramic tile grouts (sand-portland cement, dry-set, commercial portland cement, and latex-portland cement grouts), comply with ANSI A108.10.

3.4 WATERPROOFING INSTALLATION

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

3.5 FLOOR TILE INSTALLATION

- A. General: Install tile to comply with requirements in the Ceramic Tile Floor Installation Schedule, including those referencing TCA installation methods and ANSI A108 series of tile installation standards.
- B. Joint Widths: Install tile on floors with the following joint widths:

1. Ceramic Mosaic Tile: 1/16 inch.
- C. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

3.6 WALL TILE INSTALLATION

- A. Install types of tile designated for wall installations to comply with requirements in the Ceramic Tile Wall Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.
- B. Joint Widths: Install tile on walls with the following joint widths:
1. Ceramic Mosaic Tile: 1/16 inch.
 2. Wall Tile: 1/16 inch.

3.7 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
1. Remove latex-portland cement grout residue from tile as soon as possible.
 2. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
 3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to brick and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.
- C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure tile is without damage or deterioration at the time of Substantial Completion.
1. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
 2. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 09310

SECTION 09511 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes ceilings consisting of acoustical panels and exposed suspension systems.

1.3 SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Samples for Verification: Full-size units of each type of ceiling assembly indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
 - 1. 6-inch- square samples of each acoustical panel type, pattern, and color.
 - 2. Set of 12-inch- long samples of exposed suspension system members, including moldings, for each color and system type required.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Product Test Reports: Indicate compliance of acoustical panel ceilings and components with requirements based on comprehensive testing of current products.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed acoustical panel ceilings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Source Limitations for Ceiling Units: Obtain each acoustical ceiling panel from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
- C. Source Limitations for Suspension System: Obtain each suspension system from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
 - 1. Obtain both acoustical ceiling panels and suspension system from the same manufacturer.
- D. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
 - 1. Fire-response tests were performed by UL, ITS/Warnock Hersey, or another independent testing and inspecting agency that is acceptable to authorities having jurisdiction and that performs testing and follow-up services.
 - 2. Surface-burning characteristics of acoustical panels comply with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.8 EXTRA MATERIALS

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

1. Acoustical Ceiling Units: Full-size units not less than 200 square feet of acoustic panels installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the reflected ceiling plan and room finish schedule, according to the following manufacturer or approved equal.

1. Armstrong World Industries, Inc.

2.2 ACOUSTICAL PANELS

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.

1. Mounting Method for Measuring Noise Reduction Coefficient: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface per ASTM E 795.

2.3 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.
- B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

- C. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.

- D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.
- E. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- F. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- G. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch- (1-mm-) thick, galvanized steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.
- H. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's product designations, including splice plates, corner pieces, and attachment and other clips, complying with the following requirements:
1. Aluminum Alloy: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of aluminum extrusions complying with ASTM B 221/B 221M for alloy and temper 6063-T5.
 2. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.
 3. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Comply with paint manufacturer's written instructions for applying and baking and for minimum dry film thickness.
 - a. Color: White, unless otherwise indicated.
 4. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
 - a. Armstrong World Industries, Inc.
 - b. Chicago Metallic Corporation.
 - c. Donn Products, Inc.
 - d. MM Systems, Inc.
 - e. USG Interiors, Inc.
- I. Hold-Down Clips for Non-Fire-Resistance-Rated Ceilings: If required by local code, for interior ceilings consisting of acoustical panels weighing less than 1 lb/sq. ft. , provide hold-down clips spaced 24 inches o.c. on all cross tees.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage, and other conditions affecting performance of acoustical panel ceilings.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with publications referenced below per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
 - 1. Standard for Ceiling Suspension System Installations: Comply with ASTM C 636.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - 4. Secure wire hangers or any other type of hangers used, to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 6. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8 inches from ends of each member.
- C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 1. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
- D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Install acoustical panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
 - 2. Install hold-down clips in areas indicated, in areas required by local building code, and for fire-resistance ratings, if required; space as recommended by panel manufacturer's written instructions, unless otherwise indicated or required.

3.4 CLEANING

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

END OF SECTION 09511

SECTION 09651 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Vinyl composition floor tile.
- B. Related Sections include the following:
 - 1. Division 9 Section "Resilient Wall Base and Accessories" for resilient wall base, reducer strips, and other accessories installed with resilient floor tiles.

1.3 SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors and patterns available for each type of product indicated.
- C. Product Certificates: Signed by manufacturers of resilient products certifying that each product furnished complies with requirements.
- D. Maintenance Data: For resilient floor tile to include in the maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer to perform work of this Section who has specialized in installing resilient products similar to those required for this Project and with a record of successful in-service performance.
- B. Source Limitations: Obtain each type, color, and pattern of product specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to Project site in manufacturer's original, unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store products in dry spaces protected from the weather, with ambient temperatures maintained between 50 and 90 deg F.
- C. Store tiles on flat surfaces.

1.6 PROJECT CONDITIONS

- A. Maintain a temperature of not less than 70 deg F or more than 95 deg F in spaces to receive products for at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After postinstallation period, maintain a temperature of not

less than 55 deg F or more than 95 deg F.

- B. Do not install products until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by manufacturer.
- D. Install tiles and accessories after other finishing operations, including painting, have been completed.
- E. Do not install flooring over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, as determined by flooring manufacturer's recommended bond and moisture test.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. Furnish not less than one box for each 50 boxes or fraction thereof, of each type, color, pattern, class, wearing surface, and size of resilient tile flooring installed.
 - 2. Deliver extra materials to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Resilient Tile Flooring Schedule at the end of Part 3.

2.2 RESILIENT TILE

- A. VINYL LUXURY FLOOR TILE: Products complying with ASTM F 1066 and with requirements specified in the Resilient Tile Flooring Schedule.
LVT - PATCRAFT TYPOLOGY
 - a. TYPEFACE LVT COLOR 00630/PUNCTUATE - 1/3 TOTAL SF
 - b. CHARTED LVT COLOR 00630/PUNCTUATE - 1/3 TOTAL SF
 - c. LETTERPRESS LVT COLOR 00630/PUNCTUATE - 1/3 TOTAL SF

- B. SHEET VINYL - PATCRAFT ORGANIC HUE SMOKE 00710 WITH WELDED SEAMS - WEL2020

2.3 INSTALLATION ACCESSORIES

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where installation of resilient products will occur, with Installer present, for compliance with manufacturer's requirements. Verify that substrates and conditions are satisfactory for resilient product installation and comply with requirements specified.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:

1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by flooring manufacturer.
2. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with resilient product manufacturer's written installation instructions for preparing substrates indicated to receive resilient products.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Broom and vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 TILE INSTALLATION

- A. General: Comply with tile manufacturer's written installation instructions.
- B. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half of a tile at perimeter.
 1. Lay tiles square with room axis, unless otherwise indicated.
- C. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.
 1. Lay tiles in basket-weave pattern with grain direction alternating in adjacent tiles.
- D. Scribe, cut, and fit tiles to butt neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- E. Extend tiles into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent, nonstaining marking device.
- G. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to comply with tile manufacturer's written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.
 1. Provide completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing resilient products:

1. Remove adhesive and other surface blemishes using cleaner recommended by resilient product manufacturers.
 2. Sweep or vacuum floor thoroughly.
 3. Do not wash floor until after time period recommended by flooring manufacturer.
 4. Damp-mop floor to remove marks and soil.
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by flooring manufacturer.
1. Cover products installed on floor surfaces with undyed, untreated building paper until inspection for Substantial Completion.
 2. Do not move heavy and sharp objects directly over floor surfaces. Place plywood or hardboard panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.
- C. Clean floor surfaces not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products according to manufacturer's written recommendations.
1. After cleaning, reapply polish to floor surfaces to restore protective floor finish according to flooring manufacturer's written recommendations. Coordinate with Owner's maintenance program.

3.5 RESILIENT TILE FLOORING SCHEDULE

- A. Vinyl Composition Tile (VCT) : Provide vinyl composition floor tile complying with the following:
1. Products: As follows or approved equal:
 - a. Cortina Colors; Azrock Industries, Inc.
 - b. Basic Structures; Tarkett, Inc.
 - c. Excelon Imperial Texture: Armstrong
 - d. Essentials and Designer Essentials: Mannington Mills, Inc.
 2. Color and Pattern: As selected by Architect from manufacturer's full range of colors and patterns produced for tile complying with requirements indicated.
 3. Class: Class 2 (through-pattern tile)
 4. Wearing surface: Smooth.
 5. Thickness: 1/8 inch.
 6. Size: 12 by 12 inches.

END OF SECTION 09651

SECTION 09653 - RESILIENT WALL BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Resilient wall base.
 - 2. Resilient flooring accessories.
 - 3. Resilient carpet accessories.
- B. Related Sections include the following:
 - 1. Division 9 Section "Resilient Tile Flooring."

1.3 SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Samples for Initial Selection: Manufacturer's standard sample sets consisting of sections of units showing the full range of colors and patterns available for each type of product indicated.
- C. Product Certificates: Signed by manufacturers of resilient wall base and accessories certifying that each product furnished complies with requirements.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer to perform work of this Section who has specialized in installing resilient products similar to those required for this Project and with a record of successful in-service performance.
- B. Source Limitations: Obtain each type and color of product specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to Project site in manufacturer's original, unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store products in dry spaces protected from the weather, with ambient temperatures maintained between 50 and 90 deg F.

1.6 PROJECT CONDITIONS

- A. Maintain a temperature of not less than 70 deg F or more than 95 deg F in spaces to receive resilient products for

at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After postinstallation period, maintain a temperature of not less than 55 deg F or more than 95 deg F.

- B. Do not install products until they are at the same temperature as the space where they are to be installed.
- C. For resilient products installed on traffic surfaces, close spaces to traffic during installation and for time period after installation recommended in writing by manufacturer.
- D. Coordinate resilient product installation with other construction to minimize possibility of damage and soiling during remainder of construction period. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Resilient Wall Base and Accessory Schedule at the end of Part 3.

2.2 RESILIENT WALL BASE

- A. Vinyl Wall Base: Products complying with FS SS-W-40, Type II and with requirements specified in the Resilient Wall Base and Accessory Schedule.

2.3 RESILIENT ACCESSORIES

- A. Vinyl Accessories: Products complying with requirements specified in the Resilient Wall Base and Accessory Schedule.

2.4 INSTALLATION ACCESSORIES

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where installation of resilient products will occur, with Installer present, for compliance with manufacturer's requirements, including those for maximum moisture content. Verify that substrates and conditions are satisfactory for resilient product installation and comply with requirements specified. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with manufacturer's written installation instructions for preparing substrates indicated to receive

resilient products.

- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Broom and vacuum clean substrates to be covered immediately before installing resilient products. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. General: Install resilient products according to manufacturer's written installation instructions.
- B. Apply resilient wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
 - 1. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
 - 2. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
 - 3. Do not stretch base during installation.
 - 4. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
 - 5. Install premolded outside and inside corners before installing straight pieces, at conditions with 90 degree corners..
 - 6. Form outside corners on job where cmu is bullnosed, from straight pieces of maximum lengths possible, without whitening at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.
- C. Place resilient products so they are butted to adjacent materials and bond to substrates with adhesive. Install reducer strips at edges of flooring that would otherwise be exposed.

3.4 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing resilient products:
 - 1. Remove adhesive and other surface blemishes using cleaner recommended by resilient product manufacturers.
 - 2. Do not wash resilient products until after time period recommended by resilient product manufacturer.
- B. Protect resilient products against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by resilient product manufacturer.
 - 1. Cover resilient products installed with undyed, untreated building paper until inspection for Substantial Completion.
- C. Clean resilient products not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products according to manufacturer's written recommendations.

3.5 RESILIENT WALL BASE AND ACCESSORY SCHEDULE

A. Vinyl Wall Base VWB: Provide vinyl wall base complying with the following:

1. Products: Manufacturer's standard from the following manufacturers or approved equal:
 - a. Johnsonite
 - b. Mercer Products Co., Inc.
 - c. Flexco
 - d. Roppe Corp.
2. Color and Pattern: As selected by Architect from manufacturer's full range of colors and patterns produced for vinyl wall base complying with requirements indicated.
3. Style: Cove with top-set toe.
4. Minimum Thickness: 1/8 inch.
5. Height: 4 inches.
6. Lengths: Coils in lengths standard with manufacturer, but not less than 96 feet.
7. Outside Corners: Premolded or formed on job, as described in specification text.
8. Inside Corners: Premolded.
9. Surface: Smooth.

B. Vinyl Accessory Molding: Provide vinyl accessory molding complying with the following:

1. Products: As follows or approved equal:
 - a. Flexco: #64 - Tile and carpet joiner.
 - b. Johnsonite: #CTA-XX-C - Junior Carpet-to-Tile Adaptor.
 - c. Mercer: #150 - Tile-Carpet Joiner.
 - d. Roppe: #159 - Vinyl Tile Carpet Joiner.
2. Color: As selected by Architect from manufacturer's full range of color produced for vinyl accessory molding complying with requirements indicated.
3. Product Description: Transition strips for carpet and resilient flooring.
4. Profile and Dimensions: As indicated.

END OF SECTION 09653

SECTION 09680- CARPET

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet, direct-glued.
- B. Accessories.

1.02 REFERENCES

- A. ASTM D 2859 – Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2001.
- B. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 2001.
- C. CRI 104 – Standard for Installation of Commercial Textile Floorcovering Materials; Carpet and Rug Institute; 1996.
- D. NFPA 253 – Standard Test Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2000.

1.03 SUBMITTALS

- A. See Section 01600 Product Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Samples: Submit two samples 12 x 12 inch in size illustrating color and pattern for each carpet material specified.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet with minimum three year documented experience.
- C. Installer qualifications: Company specializing in installing carpet with minimum of three years experience.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
- C. Ventilate installation area during installation and 72 hours after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Carpet Tile:
 - 1. PATCRAFT MID CENTURY POP – ASHLAR PATTERN
 - a. 10381 – COLOR POP
 - b. 00650 - RETRO POP

2.02 CARPET

- A. Carpet: Tufted, nylon, conforming to the following criteria:
 - 1. Surface Texture: Texture Loop Graphics.
 - 2. Face Yarn: Mannington; DuPont Type 6.6
 - 3. Dye System: Solution Dyed and Yarn Dyed
 - 4. Fiber Technology: Mannington;
 - 5. Backing Material: Mannington; 100% Woven synthetic. Mohawk;
 - 6. Total Weight: Mannington; 20 ounce.

2.03 ACCESSORIES

- A. Sub-Floor Filler: Type Recommended by carpet manufacturer.
- B. Adhesive: Compatible with materials being adhered.
- C. Contact Adhesive: Compatible with carpet material; releasable type.

PART 3 PREPARATION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are dust free, and free of substances, which would impair bonding of adhesive to sub-floor surfaces.

3.02 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub floor surfaces.
- B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- C. Clean substrate.

3.03 INSTALLATION – GENERAL

- A. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104.
- B. Verify carpet match before cutting to ensure minimal variation between dye lots.
- C. Lay out carpet and locate seams in accordance with shop drawings:
 - 1. Locate seams in area of least traffic, out of areas pivoting traffic, and parallel to main traffic.
 - 2. Do not locate seams perpendicular through door openings.
 - 3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
 - 4. Locate change of color or pattern between rooms under door centerline.
 - 5. Provide monolithic color, pattern, and texture match within any one area.
- D. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 DIRECT – GLUED CARPET

- A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.
- B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.
- C. Apply seam adhesive to the base of edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

D. Roll with appropriate roller for complete contact of adhesive to carpet backing.

E. Trim carpet neatly at walls and around interruptions.

3.05 CLEANING

A. Remove excess adhesive from floor and wall surfaces without damage.

B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09900 - PAINTING

1PART - GENERAL

.1 RELATED DOCUMENTS

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

.2 SUMMARY

- A. This Section includes surface preparation and field painting of the following:
 - 1. Exposed exterior items and surfaces.
 - 2. Exposed interior items and surfaces.
 - 3. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.
 - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
 - 1. Prefinished items include the following factory-finished components:
 - a. Architectural woodwork and casework.
 - b. Acoustical wall panels.
 - c. Metal toilet enclosures.
 - d. Metal lockers.
 - e. Unit kitchens.
 - f. Elevator entrance doors and frames.
 - g. Elevator equipment.
 - h. Finished mechanical and electrical equipment.
 - i. Light fixtures.
 - j. Distribution cabinets.
 - 2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
 - a. Foundation spaces.
 - b. Furred areas.
 - c. Ceiling plenums.
 - d. Utility tunnels.
 - e. Pipe spaces.
 - f. Duct shafts.
 - g. Elevator shafts.
 - 3. Finished metal surfaces include the following:
 - a. Anodized aluminum.

- b. Stainless steel.
 - c. Chromium plate.
 - d. Copper.
 - e. Bronze and brass.
4. Operating parts include moving parts of operating equipment and the following:
- a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
5. Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Sections include the following:

- 1. Division 2 Section "Hot-Mix Asphalt Paving" for traffic-marking paint.
- 2. Division 2 Section "Portland Cement Concrete Paving" for traffic-marking paint.
- 3. Division 5 Section "Structural Steel" for shop priming structural steel.
- 4. Division 5 Section "Metal Fabrications" for shop priming ferrous metal.
- 5. Division 6 Section "Exterior Architectural Woodwork" for shop priming exterior architectural woodwork.
- 6. Division 6 Section "Interior Architectural Woodwork" for shop priming interior architectural woodwork.
- 7. Division 8 Section "Steel Doors and Frames" for shop priming steel doors and frames.
- 8. Division 8 Section "Wood Windows" for shop priming unclad wood windows.
- 9. Division 9 Section "Gypsum Board Assemblies" for surface preparation for gypsum board.
- 10. Division 9 Section "Special Coatings" for industrial paints and maintenance and special coatings.
- 11. Division 9 Section "Multicolored Interior Coatings" for spray-applied multicolored coatings.
- 12. Division 9 Section "Exterior Wood Stains" for exterior wood stains.
- 13. Division 9 Section "Wall Coverings" for substrate sealer under wall coverings.
- 14. Divisions 15 and 16: Painting of mechanical and electrical work is specified in Divisions 15 and 16, respectively.

- E. Alternates: Refer to Division 1 Section "Alternates" for description of Work in this Section affected by alternates.

.3 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

- 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
- 2. Eggshell refers to low-sheen finish with a gloss range between 5 and 20 when measured at a 60-degree meter.
- 3. Satin refers to low-sheen finish with a gloss range between 15 and 35 when measured at a 60-degree meter.
- 4. Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
- 5. Full gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60-degree meter.

.4 SUBMITTALS

- A. Product Data: For each paint system specified. Include block fillers and primers.

1. Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
 3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of finish-coat material indicated.
1. After color selection, the Architect will furnish color chips for surfaces to be coated.
- C. Samples for Verification: Of each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 2. Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.
 3. Submit Samples on the following substrates for the Architect's review of color and texture only:
 - a. Concrete: Provide two 4-inch- (100-mm-) square samples for each color and finish.
 - b. Concrete Masonry: Provide two 4-by-8-inch (100-by-200-mm) samples of masonry, with mortar joint in the center, for each finish and color.
 - c. Painted Wood: Provide two 12-inch- (300-mm-) square samples of each color and material on hardboard.
 - d. Stained or Natural Wood: Provide two 4-by-8-inch (100-by-200-mm) samples of natural- or stained-wood finish on actual wood surfaces.
 - e. Ferrous Metal: Provide two 4-inch- (100-mm-) square samples of flat metal and two 8-inch- (200-mm-) long samples of solid metal for each color and finish.
 - f. Exterior Stucco Plaster with Acrylic Finish Coating.
- D. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

5 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample of each type of coating and substrate required on the Project. Comply with procedures specified in PDCA P5. Duplicate finish of approved prepared samples.
1. The Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted.
 - a. Wall Surfaces: Provide samples on at least 100 sq. ft. (9 sq. m) of wall surface.
 - b. Small Areas and Items: The Architect will designate an item or area as required.

2. After permanent lighting and other environmental services have been activated, apply coatings in this room or to each surface according to the Schedule or as specified. Provide required sheen, color, and texture on each surface.
 - a. After finishes are accepted, the Architect will use the room or surface to evaluate coating systems of a similar nature.
3. Final approval of colors will be from job-applied samples.

.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
 1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's stock number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.
 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of **45 deg F (7 deg C)**. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

.7 PROJECT CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between **50 and 90 deg F (10 and 32 deg C)**.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between **45 and 95 deg F (7.2 and 35 deg C)**.
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than **5 deg F (3 deg C)** above the dew point; or to damp or wet surfaces.
 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

.8 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to the Owner.
 1. Quantity: Furnish the Owner with extra paint materials in the quantities indicated below:
 - a. Exterior, Flat Acrylic Paint: One case of each color applied.

- b. Exterior, Low-Luster Acrylic Finish: One case of each color applied.
 - c. Exterior, Semigloss Acrylic Enamel: 2 gal. (7.57 L) of each color applied.
 - d. Exterior, Full-Gloss Alkyd Enamel: 2 gal. (7.57 L) of each color applied.
 - e. Interior, Flat Acrylic Paint: One case of each color applied.
 - f. Interior, Low-Luster Acrylic Finish: One case of each color applied.
 - g. Interior, Semigloss Acrylic Enamel: 2 gal. (7.57 L) of each color applied.
 - h. Interior, Full-Gloss Alkyd Enamel: 1 gal. (3.785 L) of each color required.
2. Quantity: Furnish the Owner with an additional 5 percent, but not less than 1 gal. (3.785 L) or 1 case, as appropriate, of each material and color applied.

2PART - PRODUCTS

.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in the paint schedules.
- B. Products: Subject to compliance with requirements, provide one of the products in the paint schedules.
- C. Manufacturers Names: The following manufacturers are referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:
 - 1. Devoe & Raynolds Co. (Devoe).
 - 2. Fuller-O'Brien Paints (Fuller).
 - 3. Glidden Co. (The) (Glidden).
 - 4. Benjamin Moore & Co. (Moore).
 - 5. PPG Industries, Inc. (PPG).
 - 6. Pratt & Lambert, Inc. (P & L).
 - 7. Sherwin-Williams Co. (S-W).
 - 8. Dryvit Systems, Inc. (Dryvit)

.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: Provide custom colors of the finished paint systems to match the Architect's samples.
- D. Colors: Match colors indicated by reference to manufacturer's color designations.

3PART - EXECUTION

.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
 - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - 2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
 - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.
 - c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
 - 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

- b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
 - c. When transparent finish is required, backprime with spar varnish.
 - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.
- a. Blast steel surfaces clean as recommended by paint system manufacturer and according to requirements of SSPC-SP 10.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.
5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
- 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
- 1. Paint colors, surface treatments, and finishes are indicated in the schedules.
 - 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - 3. Provide finish coats that are compatible with primers used.
 - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned-tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
 - 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 - 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 - 8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.

9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
 10. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 2. Omit primer on metal surfaces that have been shop primed and touchup painted.
 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.
 2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work, if required by reference in the Mechanical and Electrical Drawings or Technical Specifications would be limited to items exposed in equipment rooms and in occupied spaces.
- F. Mechanical items to be painted would include, but not be limited to, the following:
1. Piping, pipe hangers, and supports.
 2. Heat exchangers.
 3. Tanks.
 4. Ductwork.
 5. Insulation.
 6. Motors and mechanical equipment.
 7. Accessory items.
- G. Electrical items to be painted would include, but not be limited to, the following:
1. Conduit and fittings.
 2. Switchgear.
 3. Panelboards.
- H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- I. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime coated by

others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.

- J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- K. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
 - 1. Provide satin finish for final coats.
- L. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.
- M. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

.4 FIELD QUALITY CONTROL

- A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:
 - 1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
 - 2. The testing agency will perform appropriate tests for the following characteristics as required by the Owner:
 - a. Quantitative material analysis.
 - b. Abrasion resistance.
 - c. Apparent reflectivity.
 - d. Flexibility.
 - e. Washability.
 - f. Absorption.
 - g. Accelerated weathering.
 - h. Dry opacity.
 - i. Accelerated yellowness.
 - j. Recoating.
 - k. Skinning.
 - l. Color retention.
 - m. Alkali and mildew resistance.
 - 3. The Owner may direct the Contractor to stop painting if test results show material being used does not comply with specified requirements. The Contractor shall remove noncomplying paint from the site, pay for testing, and repaint surfaces previously coated with the rejected paint. If necessary, the Contractor may be required to remove rejected paint from previously painted surfaces if, on repainting with specified paint, the 2 coatings are incompatible.

.5 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
 - 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

.7 EXTERIOR PAINT SCHEDULE

- A. Portland Cement Plaster: Provide the following finish systems over exterior Portland cement plaster:
 - 1. Flat Acrylic Finish: 2 finish coats over textured finish plaster.
 - a. First and Second Coats: Flat, exterior, acrylic-emulsion paint applied at spreading rate recommended by the manufacturer.
 - 1) Dryvit Systems, Inc. - 'Demandit' (DS400)
- B. Concrete, Stucco, and Masonry (Other than Concrete Masonry Units): Provide the following finish systems over exterior concrete, stucco, and brick masonry surfaces:
 - 1. Flat Acrylic Finish: 2 finish coats over a primer.
 - a. Primer: Alkali-resistant, exterior, acrylic-latex primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.5 mils** (0.038 mm).
 - 1) Devoe: 1502 Wonder-Shield Exterior Latex House Paint Primer.
 - 2) Fuller: 220-17 Acrylic Concrete and Masonry Primer Sealer.
 - 3) Glidden: Primer not required over this substrate.
 - 4) Moore: Primer not required over this substrate.
 - 5) PPG: 6-603 Speedhide Interior/Exterior Acrylic Latex Alkali Resistant Primer.
 - 6) P & L: Primer not required over this substrate.
 - b. First and Second Coats: Flat, exterior, acrylic-emulsion paint applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.4 mils** (0.061 mm).
 - 1) Devoe: 15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - 2) Fuller: 262-XX Exterior "All Surface" 100 Percent Acrylic Flat Paint.
 - 3) Glidden: 3525 Series Spred House Masonry & Stucco Finish.
 - 4) Moore: MoorLife Latex House Paint #105.
 - 5) PPG: 10 Line Pitt-Cryl Exterior Water Base Paint.
 - 6) P & L: Z/F 1900 Series Vapex Flat House Paint.
 - 2. Low-Luster Acrylic Finish: 2 finish coats over a primer.
 - a. Primer: Alkali-resistant, exterior, acrylic-latex primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.3 mils** (0.033 mm).
 - 1) Devoe: 1502 Wonder-Shield Exterior Acrylic Latex House Paint Primer.

- 2) Fuller: 220-17 Pigmented Concrete and Masonry Primer Sealer.
 - 3) Glidden: 6700 Series Spred Ultra Exterior Satin Latex House and Trim Paint thinned with **one-half pint** (0.237 L) of water per **1 gal.** (3.785 L).
 - 4) Moore: Moore's Latex Exterior Primer #102.
 - 5) PPG: 6-603 Speedhide Interior/Exterior Acrylic Latex Alkali Resistant Primer.
 - 6) P & L: Z/F 1001 Suprime "1" Multi-Purpose 100 Percent Acrylic Primer.
- b. First and Second Coats: Low-luster (eggshell or satin), exterior, acrylic-latex paint applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.3 mils** (0.058 mm).
- 1) Devoe: 16XX Wonder-Shield Exterior Acrylic Latex Satin House and Trim Paint.
 - 2) Fuller: 261-XX Eggshell Sheen Latex House and Trim Paint.
 - 3) Glidden: 6700 Series Spred Ultra Exterior Satin Latex House and Trim Paint.
 - 4) Moore: MoorGard Latex House Paint #103.
 - 5) PPG: 76 Line Sun-Proof Exterior House & Trim Acrylic Satin Latex.
 - 6) P & L: Z/F 1800 Series Aqua-Shell Exterior Latex Eggshell Paint.
3. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a primer.
- a. Primer: Alkali-resistant, exterior, acrylic-latex primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.4 mils** (0.036 mm).
- 1) Devoe: 1502 Wonder-Shield Exterior Latex House Paint Primer.
 - 2) Fuller: 220-17 Acrylic Concrete and Masonry Primer Sealer.
 - 3) Glidden: Primer not required over this substrate.
 - 4) Moore: Moore's Latex Exterior Primer #102.
 - 5) PPG: 6-603 Speedhide Interior/Exterior Acrylic Latex Alkali Resistant Primer.
 - 6) P & L: Z/F 1001 Suprime "1" Multi-Purpose 100 Percent Acrylic Primer.
- b. First and Second Coats: Semigloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.4 mils** (0.061 mm).
- 1) Devoe: 17XX Wonder-Shield Semi-Gloss Exterior Acrylic Latex House and Trim Paint.
 - 2) Fuller: 664-XX Weather King II Semi-Gloss House & Trim Paint.
 - 3) Glidden: 6600 Series Spred Ultra Exterior Gloss Latex House & Trim Paint.
 - 4) Moore: MoorGlo Latex House & Trim Paint #096.
 - 5) PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.
 - 6) P & L: Z/F 3100 Series Aqua Royal Latex House & Trim Finish.

C. Concrete Masonry Units: Provide the following finish systems over exterior concrete masonry units:

1. Flat Acrylic Finish: 2 finish coats over a block filler.
 - a. Block Filler: High-performance, latex block filler applied at spreading rate recommended by the manufacturer to achieve a total dry mill thickness of not less than **4.0 mils** (0.102 mm).
 - 1) Devoe: 52902 Bloxfil 200 Interior/Exterior Latex Block Filler.
 - 2) Fuller: 280-00 Interior/Exterior Latex Block Filler.
 - 3) Glidden: 5317 Ultra-Hide Block Filler Latex Interior-Exterior.
 - 4) Moore: Moorcraft Interior & Exterior Block Filler #173.
 - 5) PPG: 6-7 Speedhide Interior/Exterior Masonry Latex Block Filler.
 - 6) P & L: Z 98 Pro-Hide Plus Block Filler.

- b. First and Second Coats: Flat, exterior, acrylic-emulsion paint applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.4 mils** (0.061 mm).
 - 1) Devoe: 15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - 2) Fuller: 262-XX Exterior "All Surface" 100 Percent Acrylic Flat Paint.
 - 3) Glidden: 3525 Series Spred House Masonry & Stucco Finish.
 - 4) Moore: MoorLife Latex House Paint #105.
 - 5) PPG: 72 Line Sun-Proof Exterior Flat Latex House Paint.
 - 6) P & L: Z/F 1900 Series Vapex Flat House Paint.

- 2. Low-Luster Acrylic Finish: 2 finish coats over a block filler.
 - a. Block Filler: High-performance, latex block filler applied at spreading rate recommended by the manufacturer to achieve a total dry mill thickness of not less than **4.0 mils** (0.102 mm).
 - 1) Devoe: 52902 Bloxfil 200 Interior/Exterior Latex Block Filler.
 - 2) Fuller: 280-00 Interior/Exterior Latex Block Filler.
 - 3) Glidden: 5317 Ultra-Hide Block Filler Latex Interior-Exterior.
 - 4) Moore: Moorcraft Interior & Exterior Block Filler #173.
 - 5) PPG: 6-7 Speedhide Interior/Exterior Masonry Latex Block Filler.
 - 6) P & L: Z/F 98 Pro-Hide Plus Block Filler.

 - b. First and Second Coats: Low-luster (eggshell or satin), exterior, acrylic-latex paint applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.3 mils** (0.058 mm).
 - 1) Devoe: 16XX Wonder-Shield Exterior Acrylic Latex Satin House and Trim Paint.
 - 2) Fuller: 261-XX Eggshell Sheen Latex House and Trim Paint.
 - 3) Glidden: 6700 Series Spred Ultra Exterior Satin Latex House and Trim Paint.
 - 4) Moore: MoorGard Latex House Paint #103.
 - 5) PPG: 76 Line Sun-Proof Exterior House & Trim Acrylic Satin Latex.
 - 6) P & L: Z/F 1800 Series Aqua-Shell Exterior Latex Eggshell Paint.

- 3. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a block filler and a primer.
 - a. Block Filler: High-performance, latex block filler applied at spreading rate recommended by the manufacturer to achieve a total dry mill thickness of not less than **4.0 mils** (0.102 mm).
 - 1) Devoe: 52902 Bloxfil 200 Interior/Exterior Latex Block Filler.
 - 2) Fuller: 280-00 Interior/Exterior Latex Block Filler.
 - 3) Glidden: 5317 Ultra-Hide Block Filler Latex Interior-Exterior.
 - 4) Moore: Moorcraft Interior & Exterior Block Filler #173.
 - 5) PPG: 6-7 Speedhide Interior/Exterior Masonry Latex Block Filler.
 - 6) P & L: Z/F 98 Pro-Hide Plus Block Filler.

 - b. Primer: Alkali-resistant, exterior, acrylic-latex primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.4 mils** (0.036 mm).
 - 1) Devoe: Primer not required over block filler.
 - 2) Fuller: Primer not required over block filler.
 - 3) Glidden: Primer not required over block filler.
 - 4) Moore: Primer not required over block filler.
 - 5) PPG: Primer not required over block filler.
 - 6) P & L: Z/F 1001 Suprime "1" Multi-Purpose 100 Percent Acrylic Primer.

- c. First and Second Coats: Semigloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.4 mils (0.061 mm)**.
 - 1) Devoe: 17XX Wonder-Shield Semi-Gloss Exterior Acrylic Latex House and Trim Paint.
 - 2) Fuller: 664-XX Weather King II Semi-Gloss House & Trim Paint.
 - 3) Glidden: 6600 Series Spred Ultra Exterior Gloss Latex House & Trim Paint.
 - 4) Moore: MoorGlo Latex House & Trim Paint #096.
 - 5) PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.
 - 6) P & L: Z/F 3100 Series Aqua Royal Latex House & Trim Finish.

- D. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.
 - 1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a rust-inhibitive primer.
 - a. Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.3 mils (0.033 mm)**.
 - 1) Devoe: 13101 Mirrolac Rust Penetrating Metal Primer.
 - 2) Fuller: 621-04 Blox-Rust Alkyd Metal Primer.
 - 3) Glidden: 5205 Glid-Guard Tank & Structural Primer, Red.
 - 4) Moore: IronClad Retardo Rust-Inhibitive Paint #163.
 - 5) PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.
 - 6) P & L: S/D 1009 Suprime "9" Interior/Exterior Alkyd Metal Primer.

 - b. First and Second Coats: Semigloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.6 mils (0.066 mm)**.
 - 1) Devoe: 17XX Wonder-Shield Semi-Gloss Exterior Acrylic Latex House and Trim Paint.
 - 2) Fuller: 664-XX Weather King II Semi-Gloss House & Trim Paint.
 - 3) Glidden: 6600 Series Spred Ultra Exterior Gloss Latex House & Trim Paint.
 - 4) Moore: MoorGlo Latex House & Trim Paint #096.
 - 5) PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.
 - 6) P & L: Z/F 3100 Series Aqua Royal Latex House & Trim Finish.

- E. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces:
 - 1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a galvanized metal primer.
 - a. Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.2 mils (0.031 mm)**.
 - 1) Devoe: 8502/8520 Mirrolac-WB Interior/Exterior Waterborne Flat DTM Primer and Finish.
 - 2) Fuller: 621-05 Blox-Rust Latex Metal Primer.
 - 3) Glidden: 5205 Glid-Guard Tank & Structural Primer, Red.
 - 4) Moore: IronClad Galvanized Metal Latex Primer #155.
 - 5) PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.
 - 6) P & L: Z/F 1003 Suprime "3" Interior/Exterior Latex Metal Primer.

 - b. First and Second Coats: Semigloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.6 mils (0.066 mm)**.

- 1) Devoe: 17XX Wonder-Shield Semi-Gloss Exterior Acrylic Latex House and Trim Paint.
- 2) Fuller: 664-XX Weather King II Semi-Gloss House & Trim Paint.
- 3) Glidden: 6600 Series Spred Ultra Exterior Gloss Latex House & Trim Paint.
- 4) Moore: MoorGlo Latex House & Trim Paint #096.
- 5) PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.
- 6) P & L: Z/F 3100 Series Aqua Royal Latex House & Trim Finish.

F. Aluminum: Provide the following finish systems over exterior aluminum surfaces:

1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a primer.
 - a. Primer: Rust-inhibitive, acrylic- or alkyd-based, metal primer, as recommended by the manufacturer for use over aluminum, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.5 mils (0.038 mm)**.
 - 1) Devoe: 8502/8520 Mirrolac-WB Interior/Exterior Waterborne Flat DTM Primer and Finish.
 - 2) Fuller: 621-05 Blox-Rust Latex Metal Primer.
 - 3) Glidden: 6950 Lifemaster Pro Direct-to-Metal Acrylic Coating.
 - 4) Moore: Primer not required.
 - 5) PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.
 - 6) P & L: Z/F 1003 Suprime "3" Interior/Exterior Latex Metal Primer.
 - b. First and Second Coats: Semigloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.6 mils (0.066 mm)**.
 - 1) Devoe: 17XX Wonder-Shield Semi-Gloss Exterior Acrylic Latex House and Trim Paint.
 - 2) Fuller: 664-XX Weather King II Semi-Gloss House & Trim Paint.
 - 3) Glidden: 6600 Series Spred Ultra Exterior Gloss Latex House & Trim Paint.
 - 4) Moore: MoorGlo Latex House & Trim Paint #096.
 - 5) PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.
 - 6) P & L: Z/F 3100 Series Aqua Royal Latex House & Trim Finish.

.8 INTERIOR PAINT SCHEDULE

A. Concrete and Masonry (Other than Concrete Masonry Units): Provide the following paint systems over interior concrete and brick masonry surfaces:

1. Semigloss, Alkyd-Enamel Finish: 2 finish coats over a primer.
 - a. Primer: Alkali-resistant, alkyd- or latex-based, interior primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.0 mil (0.025 mm)**.
 - 1) Devoe: 51701 Wonder-Prime Interior All-Purpose Latex Primer Sealer & Vapor Barrier.
 - 2) Fuller: 220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden: 5111 Spred Ultra Latex Primer-Sealer.
 - 4) Moore: Regal First Coat Interior Latex Primer & Underbody #216.
 - 5) PPG: 6-603 Speedhide Interior/Exterior Acrylic Latex Alkali Resistant Primer.
 - 6) P & L: Z/F 1001 Suprime "1" 100 Percent Acrylic Multi-Purpose Primer.

- 7) S-W: ProMar 200 Latex Wall Primer B28W200.
- b. First and Second Coats: Odorless, semigloss, alkyd, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.6 mils** (0.066 mm).
- 1) Devoe: 26XX Velour Interior Alkyd Semi-Gloss Enamel.
 - 2) Fuller: 206-XX Interior Alkyd Semi-Gloss Enamel.
 - 3) Glidden: UH 8400 Ultra Traditional Alkyd Semi-Gloss Enamel.
 - 4) Moore: Moore's Alkyd Dulamel #207.
 - 5) PPG: 27 Line Wallhide Low Odor Interior Enamel Wall and Trim Semi-Gloss Oil.
 - 6) P & L: S/D 5700 Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W: Classic 99 Interior Alkyd Semi-Gloss Enamel A-40 Series.
2. Semigloss, Alkyd-Enamel Finish: 2 finish coats over an undercoat and a filled surface.
- a. Block Filler: High-performance, latex-based, block filler applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **5.0 mils** (0.13 mm).
- 1) Devoe: 52902 Bloxfil 200 Interior/Exterior Latex Block Filler.
 - 2) Fuller: 280-00 Interior/Exterior Latex Block Filler.
 - 3) Glidden: 5317 Ultra-Hide Block Filler, Latex Interior-Exterior.
 - 4) Moore: Moorcraft Interior & Exterior Block Filler #173.
 - 5) PPG: 6-7 Speedhide Interior/Exterior Masonry Latex Block Filler.
 - 6) P & L: Z 98 Pro-Hide Plus Latex Block Filler.
 - 7) S-W: Heavy-Duty Block Filler B42W46.
- b. Undercoat: Interior, alkyd- or latex-based, enamel undercoater, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.2 mils** (0.031 mm).
- 1) Devoe: 26XX Velour Interior Alkyd Semi-Gloss Enamel.
 - 2) Fuller: 220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden: UH 400 Ultra-Hide Alkyd Interior Enamel Undercoater.
 - 4) Moore: Moore's Alkyd Enamel Underbody #217.
 - 5) PPG: 6-855 Speedhide Interior Latex Enamel Undercoater.
 - 6) P & L: S/D 1012 Suprime "12" Interior Alkyd Wall Primer.
 - 7) S-W: Classic 99 Interior/Exterior Semi-Gloss Alkyd Enamel A-40 Series.
- c. Finish Coat: Odorless, semigloss, alkyd, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.5 mils** (0.038 mm).
- 1) Devoe: 26XX Velour Interior Alkyd Semi-Gloss Enamel.
 - 2) Fuller: 206-XX Interior Alkyd Semi-Gloss Enamel.
 - 3) Glidden: UH 8400 Ultra Traditional Alkyd Semi-Gloss Enamel.
 - 4) Moore: Satin Impervo #235.
 - 5) PPG: 27 Line Wallhide Low Odor Interior Enamel Wall and Trim Semi-Gloss Oil.
 - 6) P & L: S/D 5700 Series Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W: Classic 99 Interior/Exterior Semi-Gloss Alkyd Enamel A-40 Series.
- B. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a primer.

- a. Primer: Latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.2 mils (0.031 mm)**.
 - 1) Devoe: 50801 Wonder-Tones Interior Vinyl Latex Primer-Sealer.
 - 2) Fuller: 220-20 Pro-Tech Latex Wall Primer Sealer, White.
 - 3) Glidden: 5111 Spred Ultra Latex Primer-Sealer.
 - 4) Moore: Regal First Coat Interior Latex Primer & Underbody #216.
 - 5) PPG: 17-10 Quick-Drying Interior Latex Primer-Sealer.
 - 6) P & L: Z/F 1001 Suprime "1" 100 Percent Acrylic Multi-Purpose Primer.

 - b. First and Second Coats: Semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.6 mils (0.066 mm)**.
 - 1) Devoe: 39XX Wonder-Tones Semi-Gloss Interior Latex Enamel.
 - 2) Fuller: 214-XX AA Enamel Interior Acrylic Latex Semi-Gloss Enamel.
 - 3) Glidden: 8200 Series Spred Ultra Latex Semi-Gloss Enamel.
 - 4) Moore: Moore's Regal AquaGlo Vinyl-Acrylic Latex Enamel #333.
 - 5) PPG: 88-110 Satinhide Interior Enamel Wall & Trim Lo-Lustre Semi-Gloss Latex.
 - 6) P & L: Z/F 4100 Series Accolade Interior Semi-Gloss.
2. Semigloss, Acrylic-Enamel Finish: One finish coat over an undercoat and a primer.
- a. Primer: Alkali-resistant, alkyd- or latex-based, interior primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.2 mils (0.031 mm)**.
 - 1) Devoe: 51701 Wonder-Prime Interior All-Purpose Latex Primer Sealer & Vapor Barrier.
 - 2) Fuller: 220-06 Interior Alkyd Wall Primer Sealer.
 - 3) Glidden: 5111 Spred Ultra Latex Primer-Sealer.
 - 4) Moore: Regal First Coat Interior Latex Primer & Underbody #216.
 - 5) PPG: 6-603 Speedhide Interior/Exterior Acrylic Latex Alkali Resistant Primer.
 - 6) P & L: Z/F 1001 Suprime "1" 100 Percent Acrylic Multi-Purpose Primer.

 - b. First and Second Coats: Semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.6 mils (0.066 mm)**.
 - 1) Devoe: 39XX Wonder-Tones Semi-Gloss Interior Latex Enamel.
 - 2) Fuller: 214-XX AA Enamel Interior Acrylic Latex Semi-Gloss Enamel.
 - 3) Glidden: 8200 Series Spred Ultra Latex Semi-Gloss Enamel.
 - 4) Moore: Moore's Regal AquaGlo Vinyl-Acrylic Latex Enamel #333.
 - 5) PPG: 88-110 Satinhide Interior Enamel Wall & Trim Lo-Lustre Semi-Gloss Latex.
 - 6) P & L: Z/F 4100 Series Accolade Interior Semi-Gloss.
3. Semigloss, Alkyd-Enamel Finish: One finish coat over an undercoat and a primer.
- a. Primer: Alkali-resistant, alkyd- or latex-based, interior primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.2 mils (0.031 mm)**.
 - 1) Devoe: 51701 Wonder-Prime Interior All-Purpose Latex Primer Sealer & Vapor Barrier.
 - 2) Fuller: 220-06 Interior Alkyd Wall Primer Sealer.
 - 3) Glidden: 5111 Spred Ultra Latex Primer-Sealer.
 - 4) Moore: Regal First Coat Interior Latex Primer & Underbody #216.
 - 5) PPG: 6-603 Speedhide Interior/Exterior Acrylic Latex Alkali Resistant Primer.

- 6) P & L: Z/F 1001 Suprime "1" 100 Percent Acrylic Multi-Purpose Primer.
 - 7) S-W: ProMar 200 Interior Latex Wall Primer B28W200.
- b. First and Second Coats: Semigloss, alkyd, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.6 mils** (0.066 mm).
- 1) Devoe: 26XX Velour Interior Alkyd Semi-Gloss Enamel.
 - 2) Fuller: 206-XX Interior Alkyd Semi-Gloss Enamel.
 - 3) Glidden: UH 8400 Ultra Traditional Alkyd Semi-Gloss Enamel.
 - 4) Moore: Moore's Alkyd Dulamel #207.
 - 5) PPG: 27 Line Wallhide Low Odor Interior Enamel Wall and Trim Semi-Gloss Oil.
 - 6) P & L: S/D 5700 Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W: Classic 99 Interior Alkyd Semi-Gloss Enamel A-40 Series.

C. Woodwork and Hardboard: Provide the following paint finish systems over new, interior wood surfaces:

1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a wood undercoater.
- a. Undercoat: Alkyd- or acrylic-latex-based, interior wood undercoater, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.2 mils** (0.031 mm).
- 1) Devoe: 51701 Wonder-Prime All-Purpose Latex Primer Sealer & Vapor Barrier.
 - 2) Fuller: 220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden: UH 400 Ultra-Hide Alkyd Interior Enamel Undercoater.
 - 4) Moore: Moore's Alkyd Enamel Underbody #217.
 - 5) PPG: 6-755 Speedhide Interior Water-Based Undercoater.
 - 6) P & L: Z/F 1001 Suprime "1" 100 Percent Acrylic Multi-Purpose Primer.
- b. First and Second Coats: Semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.6 mils** (0.066 mm).
- 1) Devoe: 39XX Wonder-Tones Semi-Gloss Interior Latex Enamel.
 - 2) Fuller: 214-XX AA Enamel Interior Acrylic Latex Semi-Gloss Enamel.
 - 3) Glidden: 8200 Series Spred Ultra Latex Semi-Gloss Enamel.
 - 4) Moore: Moore's Regal AquaGlo Vinyl-Acrylic Latex Enamel #333.
 - 5) PPG: 88-110 Satinhide Interior Enamel Wall & Trim Lo-Lustre Semi-Gloss Latex.
 - 6) P & L: Z/F 4100 Series Accolade Interior Semi-Gloss.
2. Full-Gloss, Acrylic-Enamel Finish: 2 finish coats over a wood undercoater.
- a. Undercoat: Alkyd- or acrylic-latex-based, interior wood undercoater, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.1 mils** (0.028 mm).
- 1) Devoe: 51701 Wonder-Prime Interior All-Purpose Latex Primer Sealer & Vapor Barrier.
 - 2) Fuller: 220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden: 310 Glidden Wood Undercoater.
 - 4) Moore: Moore's Latex Enamel Underbody #345.
 - 5) PPG: 17-255 Quick-Drying Enamel Undercoater.
 - 6) P & L: Z/F 1001 Suprime "1" 100 Percent Acrylic Multi-Purpose Primer.
 - 7) S-W: ProMar 200 Alkyd Enamel Undercoater B21W201.

- b. First and Second Coats: Full-gloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.5 mils** (0.064 mm).
 - 1) Devoe: 84XX Mirrolac-WB Interior-Exterior Waterborne High Gloss Enamel.
 - 2) Fuller: 213-XX AA Enamel Interior Acrylic Latex High-Gloss Enamel.
 - 3) Glidden: 6900 Series Lifemaster Pro Hi-Performance Acrylic Coating.
 - 4) Moore: Impervex Enamel #309.
 - 5) PPG: 51 Line Brilliant Reflections Interior/Exterior Latex Gloss Enamel.
 - 6) P & L: Z/F 4400 Series Accolade Interior High Gloss.
 - 7) S-W: ProMar 200 Interior Latex Gloss Enamel B21W201.

D. Stained Woodwork: Provide the following stained finishes over new, interior woodwork:

- 1. Alkyd-Based, Satin-Varnish Finish: 2 finish coats of an alkyd-based, clear-satin varnish over a sealer coat and an alkyd-based, interior wood stain. Wipe wood filler before applying stain.
 - a. Filler Coat: Paste-wood filler applied at spreading rate recommended by the manufacturer.
 - 1) Devoe: None required.
 - 2) Fuller: 680-00 Pen-Chrome Paste Wood Filler.
 - 3) Glidden: Glidden Paste Wood Filler.
 - 4) Moore: Benwood Paste Wood Filler #238.
 - 5) PPG: None required.
 - 6) P & L: None required.
 - 7) S-W: Sher-Wood Fast-Dry Filler.
 - b. Stain Coat: Alkyd-based, interior wood stain applied at spreading rate recommended by the manufacturer.
 - 1) Devoe: 96XX WoodWorks Alkyd Interior Stain.
 - 2) Fuller: 640-XX Pen-Chrome Interior Oil Base Wood Stain.
 - 3) Glidden: 1600 Series Woodmaster Oil Wood Stain.
 - 4) Moore: Benwood Penetrating Stain #234.
 - 5) PPG: 77-302 Rez Interior Semi-Transparent Stain.
 - 6) P & L: S-Series Tonetic Wood Stain.
 - 7) S-W: Oil Stain A-48 Series.
 - c. Sealer Coat: Clear sanding sealer applied at spreading rate recommended by the manufacturer.
 - 1) Devoe: 4900 WoodWorks Quick-Dry Clear Sealer.
 - 2) Fuller: None recommended.
 - 3) Glidden: 5035 Ultra-Hide Quick-Dry Sanding Sealer, Clear.
 - 4) Moore: Moore's Interior Wood Finishes Quick-Dry Sanding Sealer #413.
 - 5) PPG: 77-30 Rez Interior Quick-Drying Sealer and Finish.
 - 6) P & L: H-40 Sanding Sealer.
 - 7) S-W: ProMar Varnish Sanding Sealer B26V3.
 - d. First and Second Finish Coats: Alkyd-based or polyurethane varnish, as recommended by the manufacturer, applied at spreading rate recommended by the manufacturer.
 - 1) Devoe: 4600 WoodWorks Alkyd Satin Varnish.
 - 2) Fuller: 653-01 EPA Compliant Clear Polyurethane Satin Finish.
 - 3) Glidden: 82 Satin Sheen Woodmaster Polyurethane Clear Finishes Varnish.
 - 4) Moore: Benwood Satin Finish Varnish #404.
 - 5) PPG: 77-7 Rez Varnish, Interior Satin Oil Clear.
 - 6) P & L: H24 38 Clear Finish Gloss.

- 7) S-W: Oil Base Varnish, Gloss A66V91.
2. Water-Based, Full-Gloss, Varnish Finish: 2 finish coats of a waterborne, clear, full-gloss varnish over a sealer coat and a interior wood stain. Wipe filler before applying stain.
- a. Filler Coat: Paste-wood filler applied at spreading rate recommended by the manufacturer.
- 1) Devoe: None required.
 - 2) Moore: Benwood Paste Wood Filler #238.
 - 3) PPG: None required.
 - 4) P & L: None required.
- b. Stain Coat: Interior wood stain applied at spreading rate recommended by the manufacturer.
- 1) Devoe: 41XX WoodWorks Waterborne Interior Stain.
 - 2) Moore: Benwood Penetrating Stain #234.
 - 3) PPG: 77-302 Rez Interior Semi-Transparent Stain.
 - 4) P & L: Z 197 Acrylic Latex Stain Interior.
- c. Sealer Coat: Clear sanding sealer applied at spreading rate recommended by the manufacturer.
- 1) Devoe: 4200 WoodWorks Waterborne Quick-Dry Clear Sealer.
 - 2) Moore: None recommended.
 - 3) PPG: 77-30 Rez Interior Quick-Drying Sealer and Finish.
 - 4) P & L: Z 7520 Latex Sanding Sealer.
- d. First and Second Finish Coats: Waterborne finish applied at spreading rate recommended by the manufacturer.
- 1) Devoe: 4400 WoodWorks Waterborne Crystal Clear Finish, Gloss.
 - 2) Moore: Stays Clear Acrylic Polyurethane #422, Gloss.
 - 3) PPG: 77-45 Rez Full-Gloss Acrylic Clear Polyurethane.
 - 4) P & L: Z 24 Acrylic Latex Varnish, Gloss..
- E. Natural-Finish Woodwork: Provide the following natural finishes over new, interior woodwork:
1. Waterborne, Satin-Varnish Finish: 2 finish coats of a waterborne, clear-satin varnish over a sanding sealer. Wipe wood filler before applying stain.
- a. Filler Coat: Paste-wood filler applied at spreading rate recommended by the manufacturer.
- 1) Devoe: None required.
 - 2) Moore: Benwood Paste Wood Filler #238.
 - 3) PPG: None required.
 - 4) P & L: None required.
- b. Sealer Coat: Clear sanding sealer applied at spreading rate recommended by the manufacturer.
- 1) Devoe: 4200 WoodWorks Waterborne Quick-Dry Clear Sealer.
 - 2) Moore: None recommended.
 - 3) PPG: 77-30 Rez Interior Quick-Drying Sealer and Finish.
 - 4) P & L: Z 7520 Latex Sanding Sealer.

- c. First and Second Finish Coats: Waterborne, varnish finish applied at spreading rate recommended by the manufacturer.
 - 1) Devoe: 4300 WoodWorks Waterborne Crystal Clear Finish, Satin.
 - 2) Moore: Stays Clear Acrylic Polyurethane #423, Satin.
 - 3) PPG: 77-49 Rez Satin Acrylic Clear Polyurethane.
 - 4) P & L: Z 17 Acrylic Latex Varnish, Satin.

F. Ferrous Metal: Provide the following finish systems over ferrous metal:

- 1. Low-Luster, Acrylic-Enamel Finish: 2 finish coats over a primer.
 - a. Primer: Quick-drying, rust-inhibitive, alkyd-based or epoxy-metal primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.5 mils (0.038 mm)**.
 - 1) Devoe: 13101 Mirrolac Rust Penetrating Metal Primer.
 - 2) Fuller: 621-04 Blox-Rust Alkyd & Structural Metal Primer.
 - 3) Glidden: 5207 Glid-Guard Tank & Structural Primer, White.
 - 4) Moore: IronClad Retardo Rust-Inhibitive Paint #163.
 - 5) PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.
 - 6) P & L: S 4551 Tech-Gard High Performance Rust Inhibitor Primer.
 - b. First and Second Coats: Low-luster (eggshell or satin), acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **2.8 mils (0.071 mm)**.
 - 1) Devoe: 34XX Wonder-Tones Interior Latex Eggshell Enamel.
 - 2) Fuller: 212-XX AA Enamel Acrylic Latex Eggshell Enamel.
 - 3) Glidden: 4100 Series Spred Ultra Eggshell Latex Wall & Trim Paint.
 - 4) Moore: Moore's Regal AquaVelvet #319.
 - 5) PPG: 89 Line Manor Hall Eggshell Latex Wall and Trim Paint.
 - 6) P & L: Z/F 4000 Series Accolade Interior Velvet.
- 2. Semigloss, Acrylic-Enamel Finish: One finish coat over an enamel undercoater and a primer.
 - a. Primer: Quick-drying, rust-inhibitive, alkyd-based or epoxy-metal primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.5 mils (0.038 mm)**.
 - 1) Devoe: 13101 Mirrolac Rust Penetrating Metal Primer.
 - 2) Fuller: 621-04 Blox-Rust Alkyd & Structural Metal Primer.
 - 3) Glidden: 5207 Glid-Guard Tank & Structural Primer, White.
 - 4) Moore: IronClad Retardo Rust-Inhibitive Paint #163.
 - 5) PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.
 - 6) P & L: S 4551 Tech-Gard High Performance Rust Inhibitor Primer.
 - b. Undercoat: Alkyd, interior enamel undercoat or semigloss, acrylic-latex, interior enamel, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.3 mils (0.033 mm)**.
 - 1) Devoe: 39XX Wonder-Tones Semi-Gloss Interior Latex Enamel.
 - 2) Fuller: 220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden: 8200 Series Spred Ultra Latex Semi-Gloss Enamel.
 - 4) Moore: Moore's Alkyd Enamel Underbody #217.

- 5) PPG: 6-6 Speedhide Interior Quick-Drying Enamel Undercoater.
 - 6) P & L: Z/F 4100 Series Accolade Interior Semi-Gloss.
- c. Finish Coat: Semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.3 mils** (0.033 mm).
- 1) Devoe: 39XX Wonder-Tones Semi-Gloss Interior Latex Enamel.
 - 2) Fuller: 214-XX AA Enamel Interior Acrylic Latex Semi-Gloss Enamel.
 - 3) Glidden: 8200 Series Spred Ultra Latex Semi-Gloss Enamel.
 - 4) Moore: Moore's Regal AquaGlo Vinyl-Acrylic Latex Enamel #333.
 - 5) PPG: 88-110 Satinhide Interior Enamel Wall & Trim Lo-Lustre Semi-Gloss Latex.
 - 6) P & L: Z/F 4100 Series Accolade Interior Semi-Gloss.
3. Semigloss, Alkyd-Enamel Finish: One finish coat over an enamel undercoater and a primer.
- a. Primer: Quick-drying, rust-inhibitive, alkyd-based or epoxy-metal primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.5 mils** (0.038 mm).
- 1) Devoe: 13101 Mirrolac Rust Penetrating Metal Primer.
 - 2) Fuller: 621-04 Blox-Rust Alkyd Metal Primer.
 - 3) Glidden: 5207 Glid-Guard Tank & Structural Primer, White.
 - 4) Moore: IronClad Retardo Rust-Inhibitive Paint #163.
 - 5) PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.
 - 6) P & L: S 4551 Tech-Gard High Performance Rust Inhibitor Primer.
 - 7) S-W: Kem Kromik Metal Primer B50N2/B50W1.
- b. Undercoat: Alkyd, interior enamel undercoat or semigloss, interior, alkyd-enamel finish coat, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.2 mils** (0.031 mm).
- 1) Devoe: 26XX Velour Interior Alkyd Semi-Gloss Enamel.
 - 2) Fuller: 220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden: UH 8400 Ultra Traditional Alkyd Semi-Gloss Enamel.
 - 4) Moore: Moore's Alkyd Enamel Underbody #217.
 - 5) PPG: 6-6 Speedhide Interior Quick-Drying Enamel Undercoater.
 - 6) P & L: S/D 1011 Suprime "11" Interior Alkyd Wood Primer.
 - 7) S-W: ProMar 200 Interior Alkyd Semi-Gloss Enamel B34W200.
- c. Finish Coat: Odorless, semigloss, alkyd, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.4 mils** (0.036 mm).
- 1) Devoe: 26XX Velour Interior Alkyd Semi-Gloss Enamel.
 - 2) Fuller: 110-XX Fullerglo Alkyd Semi-Gloss Enamel.
 - 3) Glidden: UH 8400 Ultra Traditional Alkyd Semi-Gloss Enamel.
 - 4) Moore: Satin Impervo #235.
 - 5) PPG: 27 Line Wallhide Low Odor Interior Enamel Wall and Trim Semi-Gloss Oil.
 - 6) P & L: S/D 5700 Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W: Classic 99 Interior/Exterior Semi-Gloss Alkyd Enamel A-40 Series.

G. Zinc-Coated Metal: Provide the following finish systems over zinc-coated metal:

1. Semigloss, Alkyd-Enamel Finish: One finish coat over an undercoat and a primer.

- a. Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.2 mils** (0.031 mm).
- 1) Devoe: 13201 Mirrolac Galvanized Metal Primer.
 - 2) Fuller: 621-05 Blox-Rust Latex Metal Primer.
 - 3) Glidden: 5207 Glid-Guard Tank & Structural Primer, White.
 - 4) Moore: IronClad Galvanized Metal Latex Primer #155.
 - 5) PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.
 - 6) P & L: Z/F 1003 Suprime "3" Interior/Exterior Latex Metal Primer.
 - 7) S-W: Galvite Paint B50W3.
- b. Undercoat: Alkyd, interior enamel undercoat or semigloss, interior, alkyd-enamel finish coat, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.2 mils** (0.031 mm).
- 1) Devoe: 26XX Velour Interior Alkyd Semi-Gloss Enamel.
 - 2) Fuller: 220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden: UH 8400 Series Spred Ultra Traditional Alkyd Semi-Gloss Enamel.
 - 4) Moore: Moore's Alkyd Enamel Underbody #217.
 - 5) PPG: 6-6 Speedhide Interior Quick-Drying Enamel Undercoater.
 - 6) P & L: S/D 1011 Suprime "11" Interior Alkyd Wood Primer.
 - 7) S-W: ProMar 200 Interior Alkyd Semi-Gloss Enamel B34W200.
- c. Finish Coat: Odorless, semigloss, alkyd, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than **1.4 mils** (0.036 mm).
- 1) Devoe: 26XX Velour Interior Alkyd Semi-Gloss Enamel.
 - 2) Fuller: 110-XX Fullerglo Alkyd Semi-Gloss Enamel.
 - 3) Glidden: UH 8400 Ultra Traditional Alkyd Semi-Gloss Enamel.
 - 4) Moore: Satin Impervo #235.
 - 5) PPG: 27 Line Wallhide Low Odor Interior Enamel Wall and Trim Semi-Gloss Oil.
 - 6) P & L: S/D 5700 Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W: Classic 99 Interior Alkyd Semi-Gloss Enamel A-40 Series.

END OF SECTION 09900

SECTION 09960 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes surface preparation and field application of high-performance coating systems to items and surfaces scheduled.
- B. Related Sections include the following:
 - 1. Division 5 Section "Structural Steel" for shop priming structural steel.
 - 2. Division 5 Section "Formed-Metal Fabrications" for shop-primed ferrous metal.
 - 3. Division 9 Section "Painting" for general field painting.
- C. Alternates: Refer to Division 1 Section "Alternates" for description of Work in this Section affected by alternates.

1.3 DEFINITIONS

- A. Standard coating terms defined in ASTM D 16 apply to this Section.
- B. Gloss ranges used in this Section include the following:
 - 1. Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
 - 2. High gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60-degree meter.
- C. Environments: The following terms are used in Part 2 of this Section to distinguish between different corrosive exposures:
 - 1. "Severe environments" are highly corrosive industrial atmospheres with sustained exposure to high humidity and condensation and with frequent cleaning using strong chemicals. Environments with heavy concentrations of strong chemical fumes and frequent splashing and spilling of harsh chemical products are severe environments.
 - 2. "Moderate environments" are corrosive industrial atmospheres with intermittent exposure to high humidity and condensation, occasional mold and mildew development, and regular cleaning with strong chemicals. Environments with exposure to heavy concentrations of chemical fumes and occasional splashing and spilling of chemical products are moderate environments.
 - 3. "Mild environments" are industrial atmospheres with normal exposure to moderate humidity and condensation, occasional mold and mildew development, and infrequent cleaning with strong chemicals. Environments with low levels of mild chemical fumes and occasional splashing and spilling of chemical products are mild environments. Normal outdoor weathering is also considered a mild environment.

1.4 SUBMITTALS

- A. Product Data: For each coating system indicated. Include block fillers and primers.
 - 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference the specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each material specified.
- B. Certification by manufacturer that products supplied comply with requirements indicated that limit the amount of VOCs in coating products.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of finish-coat material indicated.
 - 1. After color selection, Architect will furnish color chips for surfaces to be coated.
- D. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.
 - 1. Provide stepped Samples defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 - 2. List of material and application for each coat of each sample. Label each sample for location and application.
 - 3. Submit samples on the following substrates for Architect's review of color and texture:
 - a. Ferrous and Nonferrous Metal: Provide two **4-inch**-square samples of flat metal and two **8-inch** long samples of solid metal for each color and finish.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed high-performance coating system applications similar in material and extent to those indicated for Project and whose work has a record of successful in-service performance.
- B. Source Limitations: Obtain primers and undercoat materials for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample of each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.
 - 1. Architect will select one room, area, or surface to represent surfaces and conditions for application of each type of coating and substrate.
 - a. Wall Surfaces: Provide samples on at least **100 sq. ft.** of wall surface.
 - b. Small Areas and Items: Architect will designate items or areas required.
 - 2. After permanent lighting and other environmental services have been activated, apply coatings in this room or to each surface as specified. Provide the required sheen, color, and texture of each surface.
 - a. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.

3. Final approval of colors will be from benchmark samples.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label with the following information:
 1. Name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's stock number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.
 8. Handling instructions and precautions.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of **45 deg F**. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
 1. Protect materials from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and applying coatings.

1.7 PROJECT CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between **45 and 95 deg F**.
- B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than **5 deg F** above the dew point; or to damp or wet surfaces.
 1. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before proceeding with or continuing coating operation.
 2. Work may continue during inclement weather only if areas and surfaces to be coated are enclosed and temperature within the area can be maintained within limits specified by manufacturer during application and drying periods.

1.8 EXTRA MATERIALS

- A. Furnish extra high-performance coating materials from the same production run as materials applied and in quantities described below. Package coating materials in unopened, factory-sealed containers for storage and identify with labels describing contents.
 1. Quantity: Furnish extra coating materials in quantities indicated below:
 - a. Semigloss, Aliphatic Polyurethane Enamel: **2 gal. (7.57 L)** of each color applied.
 - b. Semigloss, Waterborne, Acrylic Enamel: **1 gal. (3.785 L)** of each color applied.
 - c. Semigloss, Polyamide Epoxy Coatings: One case of each color applied.
 2. Quantity: Furnish an additional 5 percent, but not less than **1 gal. (3.785 L)** or 1 case, as appropriate, of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products indicated in the coating system descriptions.
- B. Products: Subject to compliance with requirements, provide one of the products indicated in the coating system descriptions.
- C. Manufacturers' Names: The following manufacturers are referred to in the coating system descriptions by shortened versions of their names shown in parenthesis:
 - 1. Carboline Company (Carboline).
 - 2. DuPont Company, High Performance Coatings (DuPont).
 - 3. ICI Dulux Paints; Devoe Coatings (ICI).
 - 4. International Protective Coatings; Courtaulds Coatings (International).
 - 5. Moore: Benjamin Moore & Co. (Moore).
 - 6. Pittsburgh Paint; PPG Industries, Inc. (PPG).
 - 7. Rust-Oleum Corporation (R-O). High performance epoxy 9100 system.
 - 8. Sherwin Williams; Industrial and Marine Coatings (S-W).
 - 9. Tnemec Company, Inc. (Tnemec).

2.2 COATINGS MATERIALS, GENERAL

- A. Material Compatibility: Provide primers, undercoats, and finish-coat materials 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. Material Quality: Provide manufacturer's highest grade of the various high-performance coatings specified. Materials not displaying manufacturer's product identification are not acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. VOC Classification: Provide high-performance coating materials, including primers, undercoats, and finish-coat materials, that have a VOC classification of 450 g/L or less.

2.3 COLORS

- A. Colors: As selected by Architect from manufacturer's full range.

2.4 EXTERIOR HIGH-PERFORMANCE COATING SYSTEMS

- 1. Moderate Environment (Semigloss Finish): One finish coat over an intermediate coat and a primer.
 - a. Primer: Epoxy primer applied at spreading rate recommended by manufacturer.
 - 1) Carboline: 893 2-Component Cross-Linked Epoxy.
 - 2) DuPont: 25P High Solids Epoxy Mastic.
 - 3) ICI: Devran 224HS High Build Epoxy.
 - 4) Moore: M36-00/M37 Polyamide Epoxy Clear Sealer/Finish.
 - 5) PPG: 97-14XX Series Pitt-Guard DTR Polyamide Epoxy Coating.
 - 6) S-W: Recoatable Epoxy Primer B67 Series/B67V5.
 - 7) Tnemec: Series 27 F. C. Typoxy Polyamide Epoxy.

- b. Intermediate Coat: Epoxy applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 3.0 to 8.0 mils (0.076 to 0.203 mm).
 - 1) Carboline: 890 2-Component Epoxy.
 - 2) DuPont: 25P High Solids Epoxy Mastic.
 - 3) S-W: Heavy Duty Epoxy B67W300 Series.
 - 4) Tnemec: Series 66 Hi-Build Epoxoline Polamidoamine Epoxy.
 - c. Intermediate Coat: Aliphatic polyurethane enamel applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 1.5 to 4.0 mils (0.038 to 0.102 mm).
 - 1) ICI: Devthane 378 Aliphatic Urethane Semi-Gloss Enamel.
 - 2) Moore: M73/M75 Aliphatic Acrylic Urethane Semi-Gloss.
 - 3) PPG: 97-84XX Series Pitthane High Build Acrylic-Aliphatic Urethane Enamel.
 - d. Topcoat: Aliphatic polyurethane enamel applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 1.5 to 4.0 mils (0.038 to 0.102 mm).
 - 1) Carboline: Carboline 133 HB Aliphatic Polyurethane.
 - 2) DuPont: Imron 326 (13P) Semi-Gloss Polyurethane Enamel.
 - 3) ICI: Devthane 378 Aliphatic Urethane Semi-Gloss Enamel.
 - 4) Moore: M73/M75 Aliphatic Acrylic Urethane Semi-Gloss.
 - 5) PPG: 97-84XX Series Pitthane High Build Acrylic-Aliphatic Urethane Enamel.
 - 6) S-W: Corothane II Satin B65W400 Series.
 - 7) Tnemec: Series 75 Endura-Shield.
2. Moderate Environment (Semigloss Finish): One finish coat over an intermediate coat and a primer.
- a. Primer: Epoxy primer applied at spreading rate recommended by manufacturer.
 - 1) Carboline: Rustbond Penetrating Sealer SG.
 - 2) DuPont: 25P High Solids Epoxy Mastic.
 - 3) ICI: Devran 4170 Corrosion Resistant Epoxy Primer.
 - 4) Moore: M36-00/M37 Polyamide Epoxy Clear Sealer/Finish.
 - 5) PPG: 97-14XX Series Pitt-Guard DTR Polyamide Epoxy Coating.
 - 6) S-W: DTM Wash Primer B71Y1.
 - 7) Tnemec: Series 27 F. C. Typoxy Polyamide Epoxy.
 - b. Intermediate Coat: Epoxy applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 3.0 to 5.0 mils (0.076 to 0.127 mm).
 - 1) Carboline: 890 2-Component Epoxy.
 - 2) DuPont: 25P High Solids Epoxy Mastic.
 - 3) Tnemec: Intermediate coat not required.
 - c. Intermediate Coat: Aliphatic polyurethane enamel applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 1.5 to 4.0 mils (0.038 to 0.102 mm).
 - 1) ICI: Devthane 378 Aliphatic Urethane Semi-Gloss Enamel.
 - 2) Moore: M73/M75 Aliphatic Acrylic Urethane Semi-Gloss.
 - 3) PPG: 97-84XX Series Pitthane High Build Acrylic-Aliphatic Urethane Enamel.
 - 4) S-W: Corothane II Satin B65W200 Series.
 - 5) Tnemec: Intermediate coat not required.
 - d. Topcoat: Aliphatic polyurethane enamel applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 1.5 to 4.0 mils (0.038 to 0.102 mm).
 - 1) Carboline: 133 HB Aliphatic Polyurethane.
 - 2) DuPont: Imron 326 (13P) Semi-Gloss Polyurethane Enamel.

- 3) ICI: Devthane 378 Aliphatic Urethane Semi-Gloss Enamel.
- 4) Moore: M73/M75 Aliphatic Acrylic Urethane Semi-Gloss.
- 5) PPG: 97-84XX Series Pitthane High Build Acrylic-Aliphatic Urethane Enamel.
- 6) S-W: Corothane II Satin B65W200 Series.
- 7) Tnemec: Series 75 Endura-Shield.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. With Applicator present, examine substrates and conditions under which high-performance coatings will be applied, for compliance with coating application requirements.
 1. Apply coatings only after unsatisfactory conditions have been corrected and surfaces to receive coatings are thoroughly dry.
 2. Start of application is construed as Applicator's acceptance of surfaces within that particular area.
- B. Coordination of Work: Review other Sections in which primers or other coatings are provided to ensure compatibility of total systems for various substrates. On request, furnish information on characteristics of specified finish materials to ensure compatible primers.
 1. If a potential incompatibility of primers applied by others exists, obtain the following from the primer Applicator before proceeding:
 - a. Confirmation of primer's suitability for expected service conditions.
 - b. Confirmation of primer's ability to be top coated with materials specified.
 2. Notify Architect about anticipated problems before using the coatings specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
 1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.
- B. Cleaning: Before applying high-performance coatings, clean substrates of substances that could impair bond of coatings. Remove oil and grease before cleaning.
 1. Schedule cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be coated according to manufacturer's written instructions for each substrate condition and as specified.
 1. Provide barrier coats over incompatible primers or remove primers and reprime substrate.
 2. Cementitious Substrates: Prepare concrete, brick, concrete masonry block, and cement plaster surfaces to be coated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods to prepare surfaces.
 - a. Use abrasive blast-cleaning methods if recommended by coating manufacturer.

- b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not coat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
- 3. Ferrous-Metal Substrates: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC recommendations.
 - a. Blast-clean steel surfaces as recommended by coating manufacturer and according to SSPC-SP 10/NACE No. 2.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, solvent clean, and touch up with same primer as the shop coat.
- 4. Nonferrous-Metal Substrates: Clean nonferrous and galvanized surfaces according to manufacturer's written instructions for the type of service, metal substrate, and application required.
 - a. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Material Preparation: Carefully mix and prepare coating materials according to manufacturer's written instructions.
 - 1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.
 - 2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into the material. Remove film and, if necessary, strain coating material before using.
 - 3. Use only the type of thinners approved by manufacturer and only within recommended limits.
- E. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply high-performance coatings according to manufacturer's written instructions.
 - 1. Use applicators and techniques best suited for the material being applied.
 - 2. Do not apply high-performance coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
 - 3. Coating colors, surface treatments, and finishes are indicated in the coating system descriptions.
 - 4. Provide finish coats compatible with primers used.
 - 5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, grilles, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 - a. Coat surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
 - b. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- B. Scheduling Coating: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for coating as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required is the same regardless of application method.
 - a. Omit primer on metal surfaces that have been shop primed and touchup painted.
 - b. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
 - c. Where manufacturer's written instructions require sanding, sand between applications to produce a smooth, even surface.
 - d. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until coating has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat does not cause undercoat to lift or lose adhesion.
 2. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance. Give special attention to edges, corners, crevices, welds, exposed fasteners, and similar surfaces to ensure that they receive a dry film thickness equivalent to that of flat surfaces.
- C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Spray Equipment: Use mechanical methods to apply coating if permitted by manufacturer's written instructions and governing regulations.
 - a. Use spray equipment with orifice size recommended by manufacturer for material and texture required.
 - b. Apply each coat to provide the equivalent hiding of brush-applied coats.
 - c. Do not double back with spray equipment building-up film thickness of two coats in one pass, unless recommended by manufacturer.
- D. Minimum Coating Thickness: Apply each material no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by manufacturer, to material required to be coated or finished that has not been prime coated by others.
1. Recoat primed and sealed substrates if there is evidence of suction spots or unsealed areas in first coat, to ensure a finish coat with no burn-through or other defects caused by insufficient sealing.
- G. Completed Work: Match approved Samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when coatings are being applied:
1. Owner will engage the services of a qualified testing agency to sample coating material 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 appropriate tests for the following characteristics as required by Owner:
 - a. Quantitative materials analysis.
 - b. Absorption.
 - c. Accelerated weathering.
 - d. Accelerated yellowness.
 - e. Color retention.

- f. Alkali and mildew resistance.
 - g. Abrasion resistance.
 - h. Apparent reflectivity.
 - i. Washability.
 - j. Dry opacity.
 - k. Recoating.
 - l. Skinning.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with specified requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. If necessary, Contractor may be required to remove rejected materials from previously coated surfaces if, on recoating with specified materials, the two coatings are not compatible.

3.5 CLEANING

- A. Cleanup: At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being coated or not, against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
 - 1. Provide "Wet Paint" signs to protect newly coated finishes. After completing coating operations, remove temporary protective wrappings provided by others to protect their work.
 - 2. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces. Comply with procedures specified in PDCA P1.

END OF SECTION 09960

INDEX

<u>DIVISION 10</u>	<u>SPECIALTIES</u>
10155	TOILET COMPARTMENTS
10425	SIGNS
10522	FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES
10800	TOILET AND BATH ACCESSORIES

SECTION 10155 - TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes toilet compartments and screens as follows:
 - 1. Type: Solid-plastic, polymer resin.
 - 2. Compartment Style: Overhead braced and floor anchored.
 - 3. Screen Style: Wall hung.
- B. Related Sections include the following:
 - 1. Division 5 Section "Metal Fabrications" for supports that attach units to overhead structural system.
 - 2. Division 10 "Toilet and Bath Accessories" for toilet paper holders, grab bars, purse shelves, and similar accessories.

1.3 SUBMITTALS

- A. Product Data: For each type and style of toilet compartment and screen specified. Include details of construction relative to materials, fabrication, and installation. Include details of anchors, hardware, and fastenings.
- B. Shop Drawings: For fabrication and installation of toilet compartment and screen assemblies. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show locations of reinforcement and cutouts for compartment-mounted toilet accessories.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of sections of actual units showing the full range of colors, textures, and patterns available for each type of compartment or screen indicated.
- D. Samples for Verification: Of each compartment or screen color and finish required, prepared on 6-inch- (150-mm-) square Samples of same thickness and material indicated for Work.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating units without field measurements. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to established dimensions.

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:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Capitol Partitions, Inc.
 - 2. Santana Products, Inc.
 - 3. COMTEC

2.2 MATERIALS

- A. Solid-Plastic, Polymer Resin: High-density polyethylene (HDPE) with homogenous color throughout. Provide material not less than 1 inch (25 mm) thick with seamless construction and eased edges in color and pattern as follows:
 - 1. Color and Pattern: One color and pattern in each room as selected by Architect from manufacturer's full range of colors and patterns.
 - 2. Colors and Patterns: Two colors and patterns in each room as selected by Architect from manufacturer's full range of colors and patterns.
- B. Pilaster Shoes and Sleeves (Caps): ASTM A 666, Type 302 or 304 stainless steel, not less than 0.0312 inch (0.8 mm) thick and 3 inches (75 mm) high, finished to match hardware.
 - 1. For solid-plastic, polymer-resin pilasters, in lieu of stainless-steel pilaster shoes and sleeves, manufacturer's standard plastic pilaster shoes and sleeves may be provided.
- C. Stirrup Brackets: Manufacturer's standard ear or U-brackets for attaching panels and screens to walls and pilasters of the following material:
 - 1. Material: Stainless steel.
- D. Full-Height (Continuous) Brackets: Manufacturer's standard design for attaching panels and screens to walls and pilasters of the following material:
 - 1. Material: Stainless steel.
- E. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories of the following material:
 - 1. Material: Chrome-plated, nonferrous, cast zinc alloy (zamac) or clear-anodized aluminum.
- F. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile in manufacturer's standard finish.
- G. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum strip in manufacturer's standard finish.
- H. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match hardware, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use hot-dip galvanized or other rust-resistant, protective-coated steel.

2.3 FABRICATION

- A. General: Provide standard doors, panels, screens, and pilasters fabricated for compartment system. Provide units with cutouts and drilled holes to receive compartment-mounted hardware, accessories, and grab bars, as indicated.
 - 1. Provide internal reinforcement in metal units for compartment-mounted hardware, accessories, and grab bars, as indicated.
- B. Solid-Plastic, Polymer-Resin Compartments and Screens: Provide aluminum heat-sink strips at exposed bottom edges of HDPE units to prevent burning.
- C. Overhead-Braced-and-Floor-Anchored Compartments: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit floor conditions. Make provisions for setting and securing continuous head rail at top of each pilaster. Provide shoes at pilasters to conceal supports and leveling mechanism.
- D. Floor-Anchored Compartments: Provide manufacturer's standard corrosion-resistant anchoring assemblies complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.
- E. Wall-Hung Screens: Provide units in sizes indicated of same construction and finish as compartment panels, unless otherwise indicated.
 - 1. Provide metal-faced screens with integral full-height flanges for attachment to wall.
 - 2. Provide V-shaped, metal-faced screens with manufacturer's standard sound-deadening core material bonded to inner surface of face sheets. Provide metal top and bottom caps. Fabricate screens to form unit that is a maximum of 6 inches (150 mm) wide at wall and 1 inch (25 mm) wide at its protruding end. Provide complete with concealed anchoring devices for attachment to wall and mechanical leveling adjustment.
- F. Doors: Unless otherwise indicated, provide 24-inch- (610-mm-) wide in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide out-swinging doors with a minimum 32-inch- (813-mm-) wide clear opening for compartments indicated to be handicapped accessible.
 - 1. Hinges: Manufacturer's standard self-closing type that can be adjusted to hold door open at any angle up to 90 degrees.
 - 2. Latch and Keeper: Recessed latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be handicapped accessible.
 - 3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit with combination rubber-faced door strike and keeper designed for emergency access. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be handicapped accessible.
 - 4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.
 - 5. Door Bumper: Manufacturer's standard rubber-tipped bumpers at out-swinging doors or entrance screen doors.
 - 6. Door Pull: Manufacturer's standard unit that complies with accessibility requirements of authorities having jurisdiction at out-swinging doors. Provide units on both sides of doors at compartments indicated to be handicapped accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, plumb, and level. Provide clearances of not more than 1/2 inch (13 mm) between pilasters and panels and not more than 1 inch (25 mm) between panels and walls. Secure units in position with manufacturer's recommended anchoring devices.
 - 1. Secure panels to walls and panels with not less than 2 stirrup brackets attached near top and bottom of panel. Locate wall brackets so holes for wall anchors occur in masonry or tile joints. Align brackets at pilasters with brackets at walls.
- B. Overhead-Braced-and-Floor-Anchored Compartments: Secure pilasters to floor and level, plumb, and tighten. Secure continuous head rail to each pilaster with not less than 2 fasteners. Hang doors and adjust so tops of doors are parallel with overhead brace when doors are in closed position.
- C. Screens: Attach with anchoring devices according to manufacturer's written instructions and to suit supporting structure. Set units level and plumb and to resist lateral impact.

3.2 ADJUSTING AND CLEANING

- A. Hardware Adjustment: Adjust and lubricate hardware according to manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors and swing doors in entrance screens to return to fully closed position.
- B. Provide final protection and maintain conditions that ensure toilet compartments and screens are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 10155

SECTION 10425 - SIGNS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes two separate allowances to be included in the Base Bid to cover the following items:
 - 1. Interior (Panel) signs - Allowance = \$2,500
 - 2. Building Plaque - Allowance = \$1,000

1.3 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each type of sign specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- C. Shop drawings showing fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, layout, reinforcement, accessories, and installation details.
 - 1. Provide name list for each sign required, including large-scale details of lettering layout.
 - 2. Templates: Furnish full-size spacing templates for individually mounted dimensional letters.
 - 3. Furnish full-size rubbings for metal plaques.
- D. Samples: Provide the following samples of each sign component for initial selection of color, pattern and surface texture as required and for verification of compliance with requirements indicated.
 - 1. Samples for initial selection of color, pattern, and texture:
 - a. Plastic Laminate: Manufacturer's color charts consisting of actual sections of material including the full range of colors available for each material required.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Manufacturers of Panel Signs:
 - a. APCO Graphics, Inc.
 - b. ASI Sign Systems, Inc.
 - c. Best Manufacturing Company.
 - d. Poblocki & Sons, Inc.

2.2 MATERIALS

- A. Plastic Laminate: Provide high-pressure plastic laminate engraving stock with face and core plies in contrasting colors, in finishes and color combinations as selected by Architect from the manufacturer's standards. Provide a minimum of 20 colors to choose from.

2.3 INTERIOR SIGNS

- A. Interior (Panel) Signs: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
 - 1. Produce smooth, even, level sign panel surfaces, constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally.
 - 2. Minimum 1 ½ inches high.
 - 3. Length shall be 2 inches longer than lettering.
- B. Engraved Copy: Machine-engrave letters, numbers, symbols, and other graphic devices into sign panel on the face indicated to produce precisely formed copy, incised to uniform depth. Use high-speed cutters mechanically linked to master templates in a pantographic system or equivalent process capable of producing characters of the style indicated with sharply formed edges.
 - 1. Engraved Plastic Laminate: Engrave through the exposed face ply of the plastic laminate sheet to expose the contrasting core ply.
 - a. Engrave the copy to produce a minimum indentation depth of 1/32 inch and a minimum stroke width of 1/4 inch and minimum height of 1 inch.
 - b. Engrave the copy to include Grade 2 Braille.

2.4 FINISHES

- A. Colors and Surface Textures (*For Interior Signage*): For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color as selected by the Architect from the manufacturer's standards. Provide a minimum of 20 colors to choose from.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
 - 1. Install signs and plaque level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
- B. Wall-Mounted Interior (Panel) Signs: Attach panel signs to wall surfaces using the methods as recommended by the sign manufacturer.
- C. Building Plaque: Attach plaque to wall surface using the method recommended by the plaque manufacturer.
 - 1. Vinyl-Tape Mounting: Use double-sided foam tape to mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
 - 2. Shim Plate Mounting: Provide 1/8-inch-thick concealed aluminum shim plates with predrilled and countersunk holes, where other mounting methods are not practicable. Attach the plate with fasteners

and anchors suitable for secure attachment to the substrate. Attach panel sign units to the plate using the method specified above.

3.2 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION 10425

SECTION 10522 - FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Fire extinguishers.
 - 2. Fire extinguishers cabinets.

1.3 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for cabinets include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain extinguishers and cabinets from one source from a single manufacturer.
- B. UL-Listed Products: Fire extinguishers shall be UL listed with UL listing mark for type, rating, and classification of extinguisher.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. J.L. Industries
 - 2. Larsen's Manufacturing Company

2.2 FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers for each cabinet and other locations indicated, in colors and finishes selected by Architect from manufacturer's standard, that comply with authorities having jurisdiction.
- B. Dry Chemical Type: UL-rated 40-B:C, 10-lb nominal capacity, in enameled steel container.

2.3 CABINETS

- A. Construction: Manufacturer's standard box, trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Weld joints and grind smooth. Miter and weld perimeter door frames.
- B. Fire-Rated Cabinets: UL listed with UL listed mark with fire-resistance rating of wall where it is installed.
- C. Cabinet Type: Suitable for containing the following:
 - 1. Fire extinguisher.
- D. Cabinet Mounting: Suitable for the following mounting conditions"
 - 1. Semirecessed: Cabinet box (tub) partially recessed in walls of shallow depth.
- E. Trim Style: Fabricate trim in one piece with corners mitered, welded, and ground smooth.

1. Exposed Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - a. Rolled-edge trim with 2-1/2-inch backbend depth.
 - b. Trim Metal: Aluminum.
- F. Door Material and Construction: Manufacturer's standard door construction, of material indicated, coordinated with cabinet types and trim selected.
 1. Aluminum: Manufacturer's standard flush, hollow aluminum door construction.
 2. Door Glazing: Clear float glass complying with ASTM C 1036, Type I, Class 1, Quality q3.
- G. Door Style: Manufacturer's standard design.
 1. Break Glass Panel: Float Glass Panel: Float glass, 1/8 inch thick, with inside latch and lock.
- H. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam-action latch, or concealed door pull and friction latch. Provide concealed or continuous-type hinge permitting door to open 180 deg.

2.4 FINISHES FOR CABINETS, GENERAL

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying temporary stirrable protective covering prior to shipping.

2.5 ALUMINUM CABINET FINISHES

- A. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designation aluminum finishes.
- B. Class II Clear Anodized Finish: AA-M12C22A31 (Mechanical Finish: as fabricated, nonspecular, Chemical Finish: etched, medium matte; Anodic Coating: Class II Architectural, clear film thicker than 0.4 mil).

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine rough-in for hose vales, hose racks, and cabinets to verify locations of piping connections prior to cabinet installation.
- B. Examine walls and partitions for thickness and framing for cabinets to verify cabinet depth and mounting prior to cabinet installation.
- C. Do not proceed until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Follow manufacturer's printed instructions for installation.
- B. Install in locations and at mounting heights indicated or, if not indicated, at heights to comply with applicable regulations of governing authorities.
 1. Prepare recesses in walls for cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
 2. Fasten cabinets to structure, square and plumb.

END OF SECTION 10522

SECTION 10800 - TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes toilet and bath accessory items as scheduled.

1.3 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specifications Sections.
- B. Product data for each toilet accessory item specified, including construction details relative to materials, dimensions, gages, profiles, mounting method, specified options, and finishes.
- C. Schedule indicating types, quantities, sizes, and installation locations (by room) for each toilet accessory item to be provided for project.
- D. Maintenance instructions including replaceable parts and service recommendations.

1.4 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish accessory manufacturers' standard inserts and anchoring devices that must be set in concrete or built into masonry. Coordinate delivery with other work to avoid delay.
- B. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Architect.

1.5 PROJECT CONDITIONS

- A. Coordination: Coordinate accessory locations, installation, and sequencing with other work to avoid interference with and ensure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.

1.6 WARRANTY

- A. Warranty: Submit a written warranty executed by mirror manufacturer, agreeing to replace any mirrors that develop visible silver spoilage defects within warranty period.
- B. Warranty Period: 15 years from date of Substantial Completion.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide toilet accessories by one of the following:
 - 1. A & J Washroom Accessories.
 - 2. American Specialties, Inc.
 - 3. Bobrick Washroom Equipment, Inc.
 - 4. Bradley Corporation

2.2 MATERIALS, GENERAL

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 0.034 inch (22 gauge) minimum thickness.
- B. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.
- C. Mirror Glass: Nominal 6.0 mm thick, conforming to ASTM C 1036, Type I, Class 1, Quality q2, and with silvering, electro-plated copper coating, and protective organic coating.
- D. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- E. Fasteners: Screws, bolts, and other devices of same material as accessory unit, or of galvanized steel where concealed.

2.3 GRAB BARS

- A. Stainless Steel Type: Provide grab bars with wall thickness not less than 0.05 inch (18 gauge) and as follows:
 - 1. Mounting: Concealed, manufacturer's standard flanges and anchorages, including snap flanges.
 - 2. Clearance: 1-1/2 inch clearance between wall surface and inside face of bar.
 - 3. Gripping Surfaces:
 - a. Smooth, satin finish, unless otherwise indicated.
- b. Manufacturer's standard nonslip texture in handicap accessible shower stalls.
 - 4. Heavy-Duty Size: Outside diameter of 1-1/2 inches.

2.4 SANITARY NAPKIN DISPOSAL UNITS

- A. Surface-Mounted Type: Fabricate of stainless steel with seamless exposed walls, tightly self-closing top cover and locking bottom panel with continuous, stainless steel piano hinge.

2.5 SOAP DISPENSERS

- A. Liquid Soap Dispenser: Wall-mounted piston and spout-type unit with a minimum 16 fluid ounce capacity, polyethylene reservoir. Piston, springs, internal parts, and spout of stainless steel with brightly polished finish.
 - 1. Provide unit designed for mounting on wall.
 - 2. Equip unit with valve for dispensing soap in liquid form.

2.6 MIRROR UNITS

- A. Stainless Steel Framed Mirror Units: Fabricate frame with angle shapes not less than 0.04 inch (20 gauge), with square corners mitered, welded, and ground smooth. Provide in No. 4 satin polished finish.

2.7 FABRICATION

- A. General: Only a maximum 1-1/2 inch diameter, unobtrusive stamped manufacturer logo, as approved by Architect, is permitted on exposed face of toilet or bath accessory units. On either interior surface not exposed to view or back surface, provide additional identification by either a printed, waterproof label or a stamped nameplate, indicating manufacturer's name and product model number.
- B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
- C. Recessed or Semi-Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors or access panels with full-length, stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.
- D. Framed Mirror Units, General: Fabricate frames for glass mirror units to accommodate wood, felt, plastic, or other glass edge protection material. Provide mirror backing and support system that will permit rigid, tamperproof glass installation and prevent moisture accumulation, as follows:
 - 1. Provide galvanized-steel backing sheet, not less than 0.034 inch (22 gauge) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.
- E. Mirror Unit Hangers: Provide system for mounting mirror units *in corridor and classrooms* that will permit rigid, tamperproof, and theftproof installation, as follows:
 - 1. Heavy-duty wall brackets of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
- F. Keys: Where required, provide universal keys for access to toilet accessory units requiring internal access for servicing, resupply, etc. Provide keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install toilet accessory units according to manufacturers' instructions, using fasteners appropriate to substrate as recommended by unit manufacturer. Install units plumb and level, firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, according to manufacturer's instructions for type of substrate involved.
- C. Install grab bars to withstand a downward load of at least 250 lbf, complying with ASTM F 446.
- D. **Owner shall provide paper towel dispensing units along with toiler paper dispensing units. Contractor shall only install as per drawings.**

3.2 ADJUSTING AND CLEANING

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces strictly according to manufacturer's recommendations after removing temporary labels and protective coatings.

3.3 ACCESSORIES SCHEDULE

- A. Manufacturer: The following catalog number refer to products of American Specialties, Inc. and these scheduled

products serve as the standard of quality required for this project. Provide these or comparable products from specified manufacturers if they meet or exceed this standard of quality.

1. **Grab Bars:** Concealed mounting, 1 ½" diameter, nonslip texture in scheduled shower stalls, and smooth satin finish elsewhere; ASI 3800 Series. Provide units in sizes indicated on Drawings for each handicap accessible toilet and shower stall.
2. **Soap Dispenser:** Liquid, wall mounted; ASI 0350. Provide one at each lavatory.
3. **Mirrors:** Stainless steel channel frame, mirror glass; ASI 0620. Sizes as indicated on Drawings. Provide one at each lavatory.

END OF SECTION 10800