SECTION 09205

FURRING AND LATHING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies providing furring, lathing and accessories.

B. Related Work Specified Elsewhere:
   1. Access Doors and Frames: Section 08305.
   2. Plaster systems: Section 09215.
   3. Portland cement plaster: Section 09220.

1.02 PERFORMANCE REQUIREMENTS:

A. Structural Performance of Ceiling Support Systems: Limit deflection of ceiling to less than 1/360 of span.

1.03 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
   1. Product Data for each product specified.
   2. Shop Drawings: Furring layouts; locations of access panels, mechanical openings, light fixtures and electrical openings; and construction details.
   3. Samples:
      a. Four of each of the following products used in the work:
         1) Furring Channels: 12 inches long
         2) Metal lath: 12 inches square.
         3) Studs, runner and caps: 12 inches long.
         4) Tie wire: 12 inches long.
         5) Fasteners, hangers and accessories.

1.04 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. ASTM: A36, A641, A653, B69, C645, C847, C1063, E488.
   3. ML/SFA: Guide Specifications for Metal Lathing and Furring.

B. Mockups: At the start of installation, 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. The mockups shall be a part of the Work. The work must be approved by the Engineer before installation can continue.Delete below if no fire-rated plaster assemblies.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Deliver products in the original unopened packages, containers or bundles each bearing name of manufacturer, brand designation, referenced number, type and class as applicable.

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. Use platforms or other means to protect products and materials from contact with the soil. Do not store materials on finished floors.

C. Handle materials so as to preclude breakage of packages or containers and damage to materials.

PART 2 - PRODUCTS

2.01 METAL SUPPORTS FOR SUSPENDED AND FURRED CEILINGS:

A. General: Size metal ceiling supports to comply with ASTM C1063, unless otherwise indicated.

B. Cast-in-Place and Post-installed 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 E488 conducted by a qualified independent testing agency.
1. Expansion anchor.

C. Wire for Hangers: ASTM A641, Galvanized carbon-steel wire, eight-gauge minimum, medium-temper, Class 3 coating.

D. Wire for Ties: ASTM A641, Galvanized carbon-steel wire, 16-gauge minimum for securing metal furring, 18-gauge minimum for securing metal lathe, medium-temper, Class 1 coating.

E. Resilient Furring Channels: Galvanized steel, minimum 0.0209-inch-thick base (uncoated) metal, approved type, standard with the manufacturer, similar to RC-1, U.S. Gypsum Company.

F. Channels: Cold-rolled steel, minimum 0.0598-inch-thick base (uncoated) metal and 7/16-inch-wide flanges, and as follows:
1. Carrying Channels: 1-1/2 inches deep, 475 lb/1000 feet.
2. Furring Channels: 3/4 inch deep, 300 lb/1000 feet.
3. Finish: ASTM A653, G60 hot-dip galvanized coating for framing.

G. Steel Studs for Furring Channels: ASTM C645, 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: 0.0478 inch, unless otherwise indicated.
2. Depth: As indicated.
3. Protective Coating: ASTM A653, G40 galvanized coating.

2.02 STEEL STUDS AND RUNNERS:

A. General: Provide steel studs and runners complying with the following requirements:
1. Protective Coating: ASTM A653, G40 hot-dip galvanized coating.Retain above or below. Verify availability and weight of galvanized coatings with manufacturers.Retain below if galvanized coating is only required at exterior and building perimeter locations.

B. Non-Load-Bearing Studs and Runners: ASTM C645 and complying with the following requirements for minimum thickness of base (uncoated) metal and other characteristics:

1. Thickness: 0.0478 inch.
2. Depth: As indicated.

2.03 VERTICAL METAL FURRING:

A. General: Provide vertical furring complying with the following requirements:
1. Protective Coating: ASTM A653, G40 hot-dip galvanized coating.

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

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

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

2.04 LATH:

A. Expanded-Metal Lath: Comply with ASTM C847 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 A653, G60 minimum coating designation, unless otherwise indicated.
2. Diamond-Mesh Lath: Comply with the following requirements:
a. For applications directly to masonry or concrete:
1) Configuration: Self-furring.
2) Weight: 2.5-lb/sq. Yd.
b. For reinforcing at corners of opening or at internal corners:
1) Configuration: Flat.
2) Weight: 2.5-lb/sq. Yd.
c. For all other applications:
1) Configuration: Flat.
2) Weight: 3.4-lb/sq. Yd.

2.05 ACCESSORIES:

A. General: Comply with material provisions of ASTM C1063 and the requirements indicated below; coordinate depth of accessories with thicknesses and number of plaster coats required.
1. Galvanized Steel Components: Fabricated from zinc-coated (galvanized) steel sheet complying with ASTM A653, G40 minimum coating designation.
2. Zinc-Alloy Components: ASTM B69, 99 percent pure zinc.

B. Metal Corner Reinforcement: Expanded, large-mesh, diamond-metal lath fabricated from zinc-alloy or welded-wire mesh fabricated from 0.0475-inch-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-thick.
2. Galvanized Steel: Minimum 0.0179-inch-thick.

D. Casing Beads: Square-edged style, with expanded flanges of the following material:Retain 1 of first 4 below or retain last with 2 or more of first 4.
   1. Zinc Alloy: Minimum 0.0207-inch-thick.
   2. Galvanized Steel: Minimum 0.0179-inch-thick.

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-thick.
   2. Galvanized Steel: Minimum 0.0179-inch-thick.
   3. One-Piece Type: Folded pair of nonperforated screeds in M-shaped configuration, with expanded or perforated flanges.
   4. 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.
      a. Provide removable protective tape on plaster face of control joints.

G. Lath Attachment Devices: Material and type required by ASTM C1063 for installations indicated.

H. Fasteners: Clips and nails, standard with furring and lathing manufacturer.

I. Anchors: Stainless steel, Alloy 303 or 304, with the following additional requirements:
   1. Type: Through bolt in steel; expansion bolt in concrete; toggle bolt in CMU.
   2. Pull-out strength: 1,200 pounds minimum
   3. Shear strength: 1,500 pounds minimum.

PART 3 - EXECUTION

3.01 INSTALLATION OF LATH AND FURRING, GENERAL:

A. Standards: Comply with ML/SFA 920, "Guide Specifications for Metal Lathing and Furring," and with the requirements of ASTM C841 and ASTM C1063.

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.

3.02 INSTALLATION OF CEILING SYSTEMS:

A. Preparation and Coordination:

1. Do not install furring until pipe, conduits and other equipment are in place and inspected.
2. 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.
    a. 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. Perform cutting of construction necessary to install furring and lathing around ducts, conduits, pipes and equipment.

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: Suspend hangers from overhead construction. Coordinate work with construction work from which it is suspended. Space wire hangers not over 42 inches o.c., parallel with and not over 36 inches perpendicular to direction of carrying channels, unless otherwise indicated, and within 6 inches of carrying channel ends. Wrap wire hanger around carrying channel so as to develop full strength of hangers.
2. Carrying Channels: Space carrying channels not over 42 inches o.c. with 36-inch o.c. hanger spacing. Use shims or other methods, if necessary, to level channels before securing in place.
3. Furring Channels to Receive Metal Lath: Space furring channels not over 12 inches o.c. Secure furring channels to carrying channels, saddle-tied with tie wire or fastened with approved clips.

D. Where masonry partitions are erected to ceiling height only, continue suspended ceilings across partition tops without bearing on partitions. Place carrying channels, which are adjacent to and parallel to partitions, not more than six inches from face of partition.

E. Where furred ceilings are shown or specified, attach furring channels directly to the overhead construction.

F. Where shown or specified provide resilient furring channels in lieu of conventional furring channels.

G. Provide additional rods, clips and other accessories as necessary to achieve complete furring and lathing job.

3.03 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 C754.

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.

3.04 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.

3.05 INSTALLATION OF LATHING:

A. Install 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. For applications directly to masonry or concrete use 2.5-lb/sq. Yd. minimum weight, self-furring, diamond-mesh lath.
   2. For reinforcing at corners of opening or at internal corners 2..5-lb/sq. Yd. minimum weight, diamond-mesh lath.
   3. For all other applications use 3.4-lb/sq. Yd. minimum weight, diamond-mesh lath.

B. Lathing on Ceilings:
   1. Apply metal lath with long dimension of sheet at right angle to furring channels.
   2. Securely tie metal lath to supporting framing with tie wire.
   3. Tie each sheet of lath at least four times in width to each support. Lap ends and sides of sheet not less than ½-inch and lace together at approximately six inches on center. Stagger ends of sheets.

C. Lathing on Stud Partitions and Furred Walls:
   1. Provide metal lath where shown.
   2. Attach metal lath to furring channels and studs with tie wire.Insert other applications if required.

3.06 CLEANING:

A. Remove from site rubbish and debris caused by this work..

B. Leave rooms and areas in broom-clean condition.

END OF SECTION

SECTION 09215

PLASTER SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies providing plaster systems.

B. Related Work Specified Elsewhere:
   1. Furring and lathing: Section 09205.

1.02 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each.
   1. Shop Drawings:
      a. Include manufacturer's product specifications and installation instructions for each material.
      b. Samples: Panels at least 48 inches square of each type of finish for color, pattern and texture; showing the full range of variations.
   2. Certification.

1.03 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. ASTM: C28, C35, C150, C206, C842, C897, C926.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Deliver products in the original unopened packages, containers or bundles each bearing name of manufacturer, brand designation, referenced number, type and class as applicable.

B. Keep plaster and cementitious materials dry until ready to be used. Store materials off ground, under cover and away from sweating walls and other damp surfaces.

C. Handle materials so as to preclude breakage of packages or containers and damage to materials.

1.05 JOB CONDITIONS:

A. Environmental Requirements:

B. Do not apply plaster unless temperature within areas to be plastered is at least 55F for 48-hour period prior to application of plaster. Maintain this minimum temperature during application and curing operation.
   1. Keep area fully enclosed in hot, dry weather for 24 hours after application of plaster and otherwise provide proper environment to properly dry plaster. Screen openings with polyethylene or similar approved materials.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Neat Gypsum Plaster: ASTM C28.

B. Portland Cement: ASTM C150, Type I.

C. Hydrated Lime: ASTM C206, Type S.

D. Sand for Gypsum Plaster: ASTM C35.

E. Sand for Portland-Cement Plaster: ASTM C897.

F. Water: Potable.

2.02 MIXES:

A. Gypsum Plaster:
   1. Mix for scratch coat and brown coats: Proportions of neat gypsum and sand in accordance with ASTM C842, Table 3.
   2. Lime putty with gypsum gauging: Proportions in accordance with ASTM C842, Table 4A.

B. Portland-Cement Plaster:
   1. Mix in accordance with ASTM C926. Do not use masonry cement, blended cement or plastic cement.

C. For Restoration Work:
   1. Mix to match existing adjacent plaster work.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Do not apply plaster directly on painted surfaces, old plastered surfaces, bituminous-coated surfaces, or surfaces covered with waterproofing agents. Before covering such surfaces, apply furring and lathing.

B. Check metal grounds, corner beads, screeds and other accessories for alignment. Ensure that surfaces to receive plaster are square, plumb and level.

C. Remove foreign matter from surfaces to receive plaster.

D. Thoroughly wet masonry surfaces with fine fog spray of clean water to produce uniformly moist condition before plastering.

3.02 MIXING:

A. Mix plaster in mechanical mixer in accordance with ASTM C842 for gypsum and plaster and ASTM C926 for portland cement plaster. Clean mixer of set or hardened material before loading materials for new batch.

B. Keep mixing tools and equipment clean. Mix each batch separately.

C. Follow referenced specifications and manufacturer's directions for mixing sequence, cycle of operations, time and other mixing requirements.

D. Do not mix plaster over finished floors.

3.03 APPLICATION:

A. Apply gypsum plaster in accordance with ASTM C842 for gypsum and plaster and ASTM C926 for portland cement plaster, except as otherwise specified.

B. Perform plastering work under direction of competent superintendent or foreman in coordination with work of other trades.

C. Provide three-coat plastering, except as backing for tile work.

D. Do not retemper plaster. Do not use frozen, caked, lumpy or partially set plaster.

E. Apply portland-cement plaster over metal lath to minimum overall thickness of 3/4 inch, measured from face of metal lath to finish plaster surface, unless otherwise shown or specified.

F. Provide portland-cement plaster on metal lath for ceramic-tile backing.
   1. Apply base coat not less than 24 hours nor more than 60 hours before tile is to be set. Prior to final set, scratch or score base coat to produce suitable bond for leveling coat.
   2. Protect base coat and keep moist during curing period.
   3. Apply leveling coat to tolerance of 1/8-inch in 10 feet and bring base coat up to minimum thickness of 3/4-inch. Scratch leveling coat and cure for 24 hours. Leveling coat may be omitted if base coat meets tolerance and thickness requirements.

3.04 PATCH AND FINISH:

A. When so directed and after other trades have finished their work, point-up and patch plastering where necessary, point-up around trim and other set work and leave plaster work complete and perfect at final completion.

B. Replace plastering having cracks, blisters, pits, checks or discolorations. Leave plastering clean and perfect in every respect.

C. Use same mixes for patching as used for original work.

D. For one year after acceptance, repair cracks that develop.
   1. Cut plaster back to the full depth perpendicular to surface for junction with repair work.
   2. Remove entirely the plaster that has separated from its backing; back to soundly bonded plaster, to masonry, to furring or to lath undersurface, as necessary.
   3. Clean substrate of loose particles and dust. Then coat with an approved bonding agent and replaster as specified.

3.05 PROTECT AND CLEAN:

A. Protect finish work, particularly wood, aluminum and glass during plastering; repair damage or replace damaged materials.

B. Remove plaster from floors, glass and other surfaces, leaving entire work in first-class condition.

C. Remove plaster rubbish from premises and leave in broom-clean condition.

END OF SECTION

SECTION 09220

PORTLAND CEMENT PLASTER

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies providing portland cement plaster.

B. Related Work Specified Elsewhere:
   1. Access Doors and Frames: Section 08305.
   2. Furring and Lathing: Section 09205.

1.02 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
   1. Product Data for each product specified, including product specifications and installation instructions for each material.
   2. Samples for verification in units at least 12 inches 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.
   3. Material Certificates: Submit certificate signed by manufacturer for each kind of plaster aggregate certifying that materials comply with requirements.

1.03 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. ASTM: C150, C206, C207, C897, C926.Delete below if no fire-rated plaster assemblies.

B. Mockups: At the start of installation, 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. The mockups shall be a part of the Work. The work must be approved by the Engineer before installation can continue.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Deliver cementitious materials to Project site in the original unopened packages, containers, or bundles each bearing name of manufacturer, brand designation, referenced number, type and class as applicable.

B. Keep plaster and cementitious materials dry until ready to be used. Store materials inside, off the ground, under cover, and dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes. Keep products away from sweating walls and other damp surfaces.

C. Handle materials so as to preclude breakage of packages or containers and damage to materials.

1.05 PROJECT CONDITIONS:

SECTION 09255

DRYWALL SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies providing non-loadbearing drywall systems, including metal studs, metal furring and acoustical insulation.

B. Related Work Specified Elsewhere:
   1. Seals and Sealants: Section 07900.
   2. Building Insulation: Section 07210.

1.02 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements for approval and with the additional requirements as specified for each.
   1. Product Data: For each type of the product indicated.
   2. Samples:
      a. Trim Accessories: Full-size sample in 12-inch long length for each trim accessory indicated.
      b. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.
   3. Certification.
      a. Certificates from the gypsum-wallboard manufacturer verifying that materials furnished meet specified requirements.

1.03 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. ASTM: C36, C423, C475, C641, C645, C665, C754, C834, C840, C931, C954, C919, C1002, C1177, C1047, D226, E84, E90, E119, E413, E497.
   3. ASTM A 118.9, C 919.

B. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

C. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.

1.04 PRODUCT 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. Stack gypsum panels flat to prevent sagging.

1.05 JOB CONDITIONS:

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

PART 2 - PRODUCTS

2.01 STEEL PARTITION AND SOFFIT FRAMING:

A. Components, General: As follows:
   1. Comply with ASTM C 754 for conditions indicated.
   2. Steel Sheet Components: Complying with ASTM C 645 requirements for metal and with manufacturer's standard corrosion-resistant zinc coating.

B. Steel Studs and Runners: ASTM C 645, non-loadbearing
   1. Minimum Base Metal Thickness: 20 ga.
   2. Depth: As shown.

C. Deep-Leg Deflection Track: ASTM C 645 top runner with 2-inch- deep flanges.

D. Proprietary Deflection Track: Steel sheet top runner manufactured to prevent cracking of gypsum board applied to interior partitions resulting from deflection of structure above; in thickness indicated for studs and in width to accommodate depth of studs.

E. Proprietary Firestop Track: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

G. Cold-Rolled Channel Bridging: 0.0538-inch bare steel thickness, with minimum 1/2-inch- wide flange.
   1. Depth: As shown.
   2. Clip Angle: 1-1/2 by 1-1/2 inch, 0.068-inch-thick, galvanized steel.

H. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

I. Resilient Furring Channels: 1/2-inch deep, steel sheet members designed to reduce sound transmission.

J. Cold-Rolled Furring Channels: 0.0538-inch bare steel thickness, with minimum 1/2-inch-wide flange.
   1. Depth: As indicated.
   2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare steel thickness of 0.0312 inch.
   3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch diameter wire, or double strand of 0.0475-inch diameter wire.

K. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

L. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

2.02 INTERIOR GYPSUM WALLBOARD

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

B. Gypsum Wallboard: ASTM C 36.
   1. Regular Type:Regular-type gypsum panels are also available in 1/4- and 3/8-inch (6.4- and 9.5-mm) thicknesses for limited applications.
      a. Thickness: 1/2 inch, unless otherwise indicated.
      b. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
      c. Location: As indicated.
   2. Type X:
      a. Thickness: 5/8 inch.
      b. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
      c. Location: Where required for fire-resistance-rated assembly or as indicated

C. Flexible Gypsum Wallboard: ASTM C 36, manufactured to bend to fit tight radii and to be more flexible than standard regular-type panels of the same thickness.
   1. Thickness: 1/4 inch.
   2. Long Edges: Tapered.
   3. Location: As indicated

D. Sag-Resistant Gypsum Wallboard: ASTM C 36, manufactured to have more sag resistance than regular-type gypsum board.
   1. Thickness: 1/2 inch.
   2. Long Edges: Tapered.
   3. Location: Ceiling surfaces

E. Proprietary, Special Fire-Resistive Type: ASTM C 36, having improved fire resistance over standard Type X.

F. Foil-Backed Gypsum Wallboard: ASTM C 36.

G. Proprietary Abuse-Resistant Gypsum Wallboard: ASTM C 36, manufactured to produce greater resistance to surface indentation and through-penetration than standard gypsum panels.

2.03 EXTERIOR GYPSUM PANELS FOR CEILINGS AND SOFFITS

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

B. Exterior Gypsum Soffit Board: ASTM C 931/C 931M, with manufacturer's standard edges.
   1. Core: ½ inch, regular type or 5/8 inch Type X.

C. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M.

2.04 TILE BACKING PANELS

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

B. Cementitious Backer Units: ASTM A 118.9

2.05 TRIM ACCESSORIES:

A. Interior Trim: ASTM C 1047
   1. Material: , manufacturer's standard metal trim, formed from galvanized or aluminum-coated steel, or rolled zinc.
   2. Shapes:
      a. Cornerbead: Use at outside corners.
      b. Bullnose Bead: Use where indicated.
      c. LC-Bead (J Bead): Use at exposed panel edges.
      d. L-Bead: Use where indicated.
      e. U-Bead: Use where indicated.
      f. Expansion Joint Use where indicated.
      g. Curved-Edge Cornerbead: With notched or flexible flanges; use at curved openings.

B. Exterior Trim: ASTM C 1047.
   1. Material: Hot-dip galvanized steel sheet or rolled zinc.
   2. Shapes:
      a. Cornerbead: Use at outside corners.
      b. LC-Bead (J-Bead): Use at exposed panel edges.
      c. Expansion (Control) Joint.

2.06 JOINT TREATMENT MATERIALS:

A. General: Comply with ASTM C 475.

B. Joint Tape:
   1. Interior Gypsum Wallboard: Paper.
   2. Exterior Gypsum Soffit Board: Paper.
   3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.

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

D. Joint Compound for Exterior Applications:

1. Exterior Gypsum Soffit Board: Use setting-type taping and setting-type, sandable topping compounds.
2. Glass-Mat Gypsum Sheathing Board: As recommended by manufacturer.

E. Joint Compound for Tile Backing Panel:
1. Cementitious Backer Units: As recommended by manufacturer

2.07 ACOUSTICAL SEALANT:

A. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction.

2.08 AUXILIARY MATERIALS

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

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Isolation Strip at Exterior Walls:
1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

E. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

F. Thermal Insulation: As specified in Section 07210.

G. Vapor Barrier: As specified in Section 07210.

2.09 TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer.

B. Polystyrene Aggregate Ceiling Finish: Water-based, job-mixed, polystyrene aggregate finish with flame-spread and smoke-developed indices of not more than 25 when tested according to ASTM E 84.

C. Aggregate Finish: Water-based, job-mixed, aggregated, drying-type texture finish for spray application.

D. Acoustical Finish: Water-based, chemical-setting or drying-type, job-mixed texture finish for spray application:
   1. Application Thickness: 1/2 inch.
   2. Fire-Test-Response Characteristics: Indices when tested according to ASTM E 84 as follows:
      a. Flame Spread: Less than 25.
      b. Smoke Developed: Less than 450.
   3. NRC: 0.55 according to ASTM C 423.

PART 3 - EXECUTION

3.01 EXAMINATION:

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

3.02 INSTALLING STEEL PARTITION AND SOFFIT FRAMING:

A. Install tracks (runners) at floors, ceilings, and structural walls and columns where gypsum board assemblies abut other construction.
   1. Where studs are installed directly against exterior walls, install asphalt-felt or foam-gasket isolation strip between studs and wall.

B. Installation Tolerance: Install each steel framing and furring member so fastening surfaces vary not more than 1/8 inch3 mm 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 inch13 mm short of full height to provide perimeter relief.
   2. For fire-resistance-rated and STC-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid-structure 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 and to make partitions continuous from floor to underside of solid structure.
      a. Terminate partition framing at suspended ceilings where indicated

D. Install steel studs so flanges point in the same direction and leading edge or end of each panel can be attached to open (unsupported) edges of stud flanges first.

E. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
   1. Install two studs at each jamb, unless otherwise indicated.

2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint.
3. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above.
4. Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

F. Z-Furring Members:
1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches o.c.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
4. Until gypsum board is installed, hold insulation in place with 10-inch staples fabricated from 0.0625-inch- diameter, tie wire and inserted through slot in web of member.

G. Vapor Barrier: Install to comply with requirements specified in Section 07210.

3.03 APPLYING AND FINISHING PANELS, GENERAL:

A. Gypsum Board Application and Finishing Standards: ASTM C 840 and GA-216.

B. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.

C. 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.

D. Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

E. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

F. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

G. Attach gypsum panels to framing provided at openings and cutouts.

H. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members using resilient channels, or provide control joints to counteract wood shrinkage.

I. Form control and expansion joints with space between edges of adjoining gypsum panels.

J. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

K. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft.0.7 sq. m in area.

L. Fit gypsum panels around ducts, pipes, and conduits.

M. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

N. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. 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.

O. Floating Construction: Where feasible, including where recommended in writing by manufacturer, install gypsum panels over wood framing, with floating internal corner construction.

P. STC-Rated Assemblies: Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

Q. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
   1. Space screws a maximum of 12 inches o.c. for vertical applications.

R. Space fasteners in panels that are tile substrates a maximum of 8 incheso.c.

3.04 PANEL APPLICATION METHODS:

A. Single-Layer Application:
   1. On ceilings, apply gypsum panels before 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 vertically (parallel to framin),, unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
      a. Stagger abutting end joints not less than one framing member in alternate courses of board.
      b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
   3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

B. Multilayer Application on Ceilings: Apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

C. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

1. Z-Furring Members: Apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

D. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.

E. Multilayer Fastening Methods: Fasten base layers and face layers separately to supports with screws.

F. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

G. Curved Partitions:

1. Install panels horizontally and unbroken, to the extent possible, across curved surface plus 12-inch300-mm-long straight sections at ends of curves and tangent to them.
2. On convex sides of partitions, begin installation at one end of curved surface and fasten gypsum panels to studs as they are wrapped around curve. On concave side, start fastening panels to stud at center of curve and work outward to panel ends. Fasten panels to framing with screws spaced 12 inches o.c.
3. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.

H. Exterior Soffits and Ceilings: Apply exterior gypsum soffit board panels perpendicular to supports, with end joints staggered and located over supports.

1. Install with 1/4-inch open space where panels abut other construction or structural penetrations.
2. Fasten with corrosion-resistant screws.

I. Tile Backing Panels:

1. Cementitious Backer Units: ANSI A108.11, at locations indicated to receive tile.
2. Areas Not Subject to Wetting: Install standard gypsum wallboard panels to produce a flat surface except at showers, tubs, and other locations indicated to receive water-resistant panels.
3. Where tile backing panels abut other types of panels in the same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.05 INSTALLING TRIM ACCESSORIES:

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations shown or indicated. Install control joints according to ASTM C 840 and in specific locations approved by the Engineer for visual effect.

3.06 FINISHING GYPSUM BOARD ASSEMBLIES:

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

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

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
   1. Level 2: Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges where.
   2. Level 3: Embed tape and apply separate first and fill coats of joint compound to tape, fasteners, and trim flanges at surfaces recivfing textured finish.

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

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

3.07 APPLYING TEXTURE FINISHES:

A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.

B. Texture Finish Application: Mix and apply finish using powered spray equipment, to 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 to prevent damage according to texture finish manufacturer's written recommendations.

3.08 FIELD QUALITY CONTROL:

A. Above-Ceiling Observation: Before Contractor installs gypsum board ceilings, Architect will conduct an above-ceiling observation and report deficiencies in the Work observed. Do not

proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.

1. Notify the Engineer in advance of date and time when Project, or part of Project, will be ready for above-ceiling observation.
2. Before notifying the Engineer, 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.

END OF SECTION

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. Keep area fully enclosed in hot, dry weather for 24 hours after application of plaster. 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. Plaster Work: Maintain at least 55 deg F temperature in areas to be plastered for at least 48 hours before, during, and after application.

E. Ventilation: Provide natural or mechanical means of ventilation to properly dry interior spaces after portland cement plaster has cured.

F. 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

2.01 PLASTER MATERIALS:

A. Base-Coat Cements: Type as indicated below:
   1. Portland cement, ASTM C150, Type I.

B. Job-Mixed Finish-Coat Cement: Material and color as indicated below:
   1. Portland cement, ASTM C150, Type I.

C. Factory-Prepared Finish Coat: Manufacturer's standard factory-packaged blend of portland cement, ASTM C150, Type I or II; hydrated lime, Type S, ASTM C206 or ASTM C207; aggregate, ASTM C897; and compatible with base coat and finish texture indicated; in color indicated below:
   1. White, unless otherwise indicated.

D. Lime: Special hydrated lime for finishing purposes, ASTM C206, Type S; or special hydrated lime for masonry purposes, ASTM C207, Type S.

E. Sand Aggregate for Base Coats: ASTM C897.

F. Aggregate for Finish Coats: ASTM C897 system and as indicated below:
   1. Manufactured or natural sand, white in color, unless otherwise indicated.

2.02 MISCELLANEOUS MATERIALS:

A. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, ½-inch long, free of contaminates, manufactured for use in portland cement plaster.

B. Water for Mixing and Finishing Plaster: Potable.

C. Furring and Lathing: Section 09205.

2.03 PLASTER MIXES AND COMPOSITIONS:

A. General: Comply with ASTM C926 for base- and finish-coat mixes as applicable to plaster bases, materials, and other requirements indicated.

B. Do not use masonry cement, blended cement or plastic cement.

C. 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 ASTM C926 requirements. Adjust mix proportions below within limits specified to attain workability.

D. Fiber Content: If indicated, Add fiber to mix after ingredients have mixed at least 2 minutes. Comply with fiber manufacturer's written instructions but do not exceed 1 lb/cu. ft. of cementitious materials. Reduce aggregate quantities accordingly to maintain workability.

E. Factory-Prepared Finish Coats: Add water only; comply with finish coat manufacturer's written instructions.

F. For Restoration Work: Mix to match adjacent plaster work.

2.04 MIXING:

A. Mechanically mix cementitious and aggregate materials for plasters to comply with ASTM C926 and with recommendations of plaster manufacturer.

B. Follow referenced specifications and recommendations of plaster manufacturer for mixing sequence, cycle of operations, time and other mixing requirements.

C. Clean mixer of set or hardened materials before loading materials for a new batch.

D. Mix each batch separately.

E. Keep mixing tools and equipment clean.

F. Do not mix plaster over finished floors.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Do not apply plaster directly on painted surfaces, old plastered surfaces, bituminous-coated surfaces or surfaces covered with waterproofing agents. Before covering such surfaces, apply furring and lathing as specified in Section 09205.

B. Clean plaster bases and substrates for direct application of plaster, removing loose material and substances that may impair the Work.

C. Surface Conditioning: Immediately before plastering, dampen concrete and concrete unit masonry surfaces that are indicated for direct plaster application. Determine and apply amount of moisture and degree of saturation that will result in optimum suction for plastering.

3.02 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 the Engineer:
      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 in either direction or a length-to-width ratio of 2-1/2 to 1.
      c. Wall Areas: Not more than 144 sq. ft.
      d. Horizontal Surfaces: Not more than 100 sq. ft. in area.
      e. Where plaster panel sizes or dimensions change, extend joints full width or height of plaster membrane.

3.03 PLASTER APPLICATION:

A. All plaster work shall be performed under the direction of a competent superintendent or foreman.

B. Plaster Application Standard: Apply plaster materials, composition, and mixes to comply with ASTM C926.

C. Do not use materials that are frozen, caked, lumpy, dirty, or contaminated by foreign materials.

D. Do not use excessive water in mixing and applying plaster materials.

E. Flat Surface Tolerances: Do not deviate more than plus or minus 1/8 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed at any location on surface.

F. 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 at each jamb anchor.

G. Sequence plaster application with installation and protection of other work so that neither will be damaged by installation of other.

H. 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.

I. 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.

J. Provide three coat plastering, except as backing for tile work.

K. Apply portland cement plaster over metal lath to minimum overall thickness of 3/4-inch, measured from face of metal lath to finish plaster surface, unless otherwise shown or specified.

L. Provide portland cement plaster on metal lath for ceramic tile backing.
1. Apply base coat not less than 24 hours nor more than 60 hours before tile is to be set. Prior to final set, scratch or score base coat to produce suitable bond for leveling coat.
2. Protect base coat and keep moist during curing period.
3. Apply leveling coat to tolerance of 1/8-inch in 10 feet and bring base coat up to minimum thickness of 3/4-inch. Scratch leveling coat and cure for 24 hours. Leveling coat may be omitted if base coat meets tolerance and thickness requirements.

M. Moist-cure plaster base and finish coats to comply with ASTM C926, including written instructions for time between coats and curing in "Annex A2 Design Considerations."

3.04 CUTTING AND PATCHING:

A. When so directed and after other trades have finished their work, point-up and patch plastering where necessary.

B. 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.

C. Use same mixes for patching as used for original work.

D. For one year after acceptance, repair cracks that develop in accordance with the following:
1. Cut plaster back to the full depth perpendicular to surface for junction with repair work.
2. Remove entirely the plaster that has separated from its backing; back to soundly bonded plaster, to masonry, to furring or to lath undersurface, as necessary.
3. Clean substrate of loose particles and dust. Then coat with an approved bonding agent and replaster as specified.

3.05 CLEANING AND PROTECTING:

A. Protect finish work, particularly wood, aluminum and glass during plastering; repair damage or replace damaged materials.

B. 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.

C. When plastering work is completed, remove unused materials, containers, equipment, and plaster debris and leave premises in a broom-clean condition.

D. 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

SECTION 09320

TILE

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies providing ceramic tile, ceramic mosaic tile, quarry tile and marble thresholds, typically in restricted areas as shown.

B. Related Work Specified Elsewhere:
   1. Cast-in-Place Structural Concrete: Section 03300.
   2. Seals and Sealants: Section 07900.
   3. Paver Tile: Section 09340.

1.02 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 C1028:
   1. Level Surfaces: Minimum 0.6.
   2. Ramp Surfaces (slope grater than 1:20): Minimum 0.8.

1.03 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
   1. Product Data: For each type of tile, mortar, grout, and other products specified. Include recommendations for product application and use.
   2. Shop Drawings: For the following:
      a. Tile patterns and locations.
      b. Widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
   3. 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.
   4. 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.
   5. Samples for Verification: Of each item listed below, prepared on Samples of size and construction indicated. Where products involve normal color and texture variations, include Sample sets showing the full range of variations expected.
      a. Ceramic and Ceramic Mosaic Tile: Three panels of each type and composition of tile and for each color and texture required, 12 inches square, mounted on 16 inches square by 1/4-inch thick hardboard with grouted joints using product complying with specified requirements and approved for completed work in color or colors selected by the Engineer.
      b. Full-size units of each type of trim and accessory for each color required.
      c. Quarry Tile: Four standard size units mounted on 16 inches square by 1/4-inch thick hardboard with grouted joints using product complying with specified requirements and approved for completed work in color or colors selected by the Engineer.
      d. Marble Threshold: Three 12-inch lengths showing range of color, veining and finish.

6. Master Grade Certificates: For each shipment, type, and composition of tile, per ANSI A137.1, bearing TCA-Certification Mark, signed by tile manufacturer and Installer stating type and quality of material. Submit at time of shipment..
7. Product Certificates: Signed by manufacturers certifying that the products furnished comply with requirements.
8. Tile Test Reports: Certified test reports in accordance with ANSI A118.1 through A118.4.

1.04 QUALITY ASSURANCE:

A. Codes Regulations, Reference Standards and Specifications:
1. Comply with the codes and regulations of the jurisdictional authorities.
2. ADA: Americans with Disabilities Act.
3. ANSI: A108.1C, A108.5, A108.6, A108.10, A118.1, A118.2, A118.3, A118.4, A118.6, A137.1.
4. ASTM: A82, A185, C144, C150, C206, C207, C241, C503, C920, C1028, D4397.
5. FS: UU-B-790.
6. TCA: Handbook for Ceramic Tile Installation.

B. 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.

C. 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.

D. 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.

E. Mockups: Before installing floor and wall tile, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for completed Work.
1. Mockups shall be minimum four feet square and in the location as directed by the Engineer.
2. Notify the Engineer seven days in advance of the dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain the Engineer's approval of mockups before proceeding with final unit of Work.
5. Approved mockups may become part of the completed Work.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Deliver materials to the site in original unopened containers, clearly labeled with the manufacturer’s name, brand designation, type, grade and color. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.

B. Store materials so as to prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

C. Handle materials so as to prevent breakage of containers and damage to materials.

1.06 PROJECT CONDITIONS:

A. Environmental Limitations: Do not start tile work unless ambient temperature of area in which work occurs is at least 50 deg. F and rising and is maintained at not less than 50 deg. F without interruption while work is being done and for at least 72 hours after completion.

B. Substrate Conditions: Do not start tile work unless surfaces to receive tile are in satisfactory condition. Commencement of tile work constitutes Contractor's acceptance of the subfloor condition in accordance with ANSI A108-AN-2, General Requirements for Subsurfaces.

1.07 EXTRA MATERIALS:

A. Deliver extra materials to Owner. Furnish and store extra materials in locations as directed on pallets and in original containers with protective covering for storage, and are clearly identified with labels describing contents and area of placement.
   1. Tile and Trim Units: Furnish quantity of full-size units equal to 5 percent of amount installed, for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.01 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 and Grouting Materials" article.

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 Engineer's selections from manufacturer's full range of colors, textures, and patterns for products of type indicated.
   2. Provide tile trim and accessories that match color and finish of adjoining flat tile.

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.

2.02 TILE PRODUCTS:

A. Unglazed Ceramic Mosaic Floor Tile: Provide factory-mounted flat tile complying with the following requirements:
   1. Composition: Porcelain or porcelain with abrasive admixture, as indicated.
   2. Module Size: 2 by 2 inches (nominal).
   3. Nominal Thickness: 1/4 inch.
   4. Face: Plain with cushion edges.

B. Unglazed Quarry Tile: Provide square-edged flat tile complying with the following requirements:

1. Wearing Surface: Nonabrasive or abrasive aggregate embedded in surface, as indicated.
2. Facial Dimensions: 6 by 6 inches (nominal).
3. Thickness: 1/2 inch.
4. Face: Plain.

C. Glazed 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. Color: White.

D. 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 Thin-Set Mortar Installations: Straight.
b. External Corners for Thin-Set Mortar Installations: Surface bullnose.
c. Internal Corners: Field-butted square corners, except with coved base and cap angle pieces designed to member with stretcher shapes.

2.03 STONE THRESHOLDS:

A. General: Provide stone thresholds that are uniform in color and finish, fabricated to sizes and profiles indicated to provide transition between tile surfaces and adjoining finished floor surfaces.
1. Fabricate thresholds to heights indicated, but not more than ½-inch above adjoining finished floor surfaces, with transition edges beveled on a slope of no greater than 1:2.

B. Marble Thresholds: Provide marble thresholds complying with ASTM C503 requirements for exterior use and with a minimum abrasive-hardness value (Ha) of 10 per ASTM C241.
1. Provide white, honed marble complying with the Marble Institute of America's Group A requirements for soundness.

2.04 SETTING AND GROUTING MATERIALS:

A. Portland Cement: ASTMC150, Type I.

B. Sand: ASTM C144.

C. Hydrated Lime: ASTM C206 or ASTM C207, Type S.

D. Water: Potable.

E. Portland Cement Mortar Installation Materials: Provide materials complying with ANSI A108.1A and as specified below:
1. Cleavage Membrane: Polyethylene sheeting ASTM D4397, 4.0 mils thick.
2. Reinforcing Wire Fabric: Galvanized, welded wire fabric, 2 by 2 inches by 0.062-inch diameter; comply with ASTM A185 and ASTM A82, except for minimum wire size.

F. Dry-Set Portland Cement Mortar: ANSI A118.1.

G. 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.

H. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate as required to produce color indicated.

I. Dry-Set Grout: ANSI A118.6, color as indicated.

J. 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 and 212 deg F, respectively, as certified by mortar manufacturer for intended use.

2.05 ELASTOMERIC SEALANTS AND BACKUP JOINT FILLER:

A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements of Section 07900.

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 C920; 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. Multipart, Pourable Urethane Sealant for Use T: ASTM C920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.

E. Backup Material: As recommended by sealant manufacturer and as required in Section 07900.

F. Prime and Joint Cleaner: Use products as recommended by sealant manufacturer.

2.06 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. Concrete Leveling Bed: In accordance with Section 03300, Class 3500 concrete, pea gravel course aggregate 1/4-inch minimum to 3/8-inch maximum. Adjust slump with plasticizers to maintain proper water-cement ratio.

C. Building Paper: FS UU-B-790, red-rosin-sized building, Type I, Style 1B.

D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.07 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

3.01 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 the Engineer.

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

3.02 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. Provide leveling course for masonry or concrete-wall when variation exceeds 1/4-inch in eight feet. Leveling course shall consist of dry-set mortar to which an equal volume of a mixture of one-part portland cement and 1-1/2 parts sand has been added. Apply leveling course to maximum thickness of 1/4-inch.

D. 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.

3.03 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. Coordinate tile work with work of other trades.

D. 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.

E. 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.

F. 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, use plastic spacers to make joints between tile sheets the same width as joints within tile sheets so joints between sheets are not apparent in finished work.

3.04 FLOOR TILE INSTALLATION:

A. General: Install floor tile by the portland cement mortar method in accordance with ANSI A108.1C.

B. Tile Type: Unglazed ceramic mosaic tile and quarry tile.

C. Setting Bed and Grout: ANSI A108.1C with the following mortar and grout:
   1. Dry-set portland cement mortar.
   2. Dry-set grout.

D. Joint Widths: Install tile on floors joint widths as recommended by the tile manufacturer.

E. Grout: Dry-set grout in accordance with ANSI A108.10.

F. Where depression is not provided for mortar setting bed, install floor tile by the epoxy method in accordance with ANSI A108.6.

3.05 WALL TILE INSTALLATION:

A. General: Install wall tile by the dry-set mortar method in accordance with ANSI A108.5.

B. Tile Type: Glazed wall tile.

C. Setting Bed and Grout: ANSI A108.5 with the following mortar and grout:
   1. Dry-set portland cement mortar.
   2. Dry-set grout.

D. Joint Widths: Install tile on floors joint widths as recommended by the tile manufacturer.

E. Grout: Dry-set grout in accordance with ANSI A108.10.

F. Where inside corners are shown as flat tiles, make corner joint a sealant joint as specified for expansion joints below.

3.06 STONE THRESHOLD INSTALLATION:

A. Stone Thresholds: Install stone thresholds at locations indicated; set in same type of setting bed as abutting field tile, unless otherwise indicated.
   1. Set thresholds in latex-portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent nontile floor finish.

3.07 EXPANSION AND CONTROL JOINT INSTALLATION:

A. Provide expansion and control joints around floor perimeters, at interior corners of tiled walls, in tile surfaces directly above joints in concrete substrates and where recommended by the TCA Handbook for Ceramic Tile Installation.

B. Do not saw-cut joints after installing tiles.

C. Install removable divider strips of the same depth as the finished tile system, including setting bed, to keep sealant joints free of setting bed, mortar and grout. Remove strips after grouting and curing operations in order to install sealant.

D. Install and cure sealant in accordance with manufacturer's instructions. Use primer unless sealant manufacturer recommends against priming.

3.08 CLEANING AND PROTECTING:

A. Cleaning: On completion of placement and grouting, clean tile surfaces with warm water and washing compound in accordance with recommendations of tile manufacturer. Sponge and wash tile thoroughly and polish with clean dry cloths.
   1. The use of acid or acid cleaners on tile is prohibited.

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 building paper taped to tile to prevent staining, damage, and wear. Lay board walkways on floors to be used as passageways.
   2. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

SECTION 09340

PAVER TILE

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies providing paver tiles, typically in patron areas as shown. These tiles are noted on Drawings as:
   1. Paver tile.
   2. Truncated dome quarry tile.

B. Related Work Specified Elsewhere:
   1. Concrete overlay: Section 03300.
   2. Expansion joint assembly: Sections 05810 and 05811.
   3. Sealant backup material and sealant joint installation requirements: Section 07900.

1.02 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. ANSI: A108-AN-2, A108.1C, A108.4, A108.5, A108.6, A108.10, A118.3, A118.4, A118.6, A136.1, A137.1.
   3. AASHTO: M153.
   4. ASTM: A185, C171, C501, C373, C485, C499, C836, C920, C1028.
   5. TCA: TCA Handbook for Ceramic Tile Installation.
   6. Americans With Disabilities Act (ADA).

1.03 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
   1. Product Data: Manufacturer’s product data for each product required. Include recommendations for product application and use.
   2. Shop Drawings:
      a. Include layout of paver tile, locations and sizes of expansion joints and control joints, details of installation, materials manufacturers' catalogs, recommendations and applicable specifications.
      b. Indicate limits of ramps (surfaces with a slope greater than 1:20) and areas where tile with abrasive aggregate is required according to its coefficient of friction.
   3. Samples:
      a. Three 24-inch square panels showing paver tile, bonding method, joint materials, expansion-joint sealants, color and texture.
      b. Demonstration sample of platform edge paver installation where directed , minimum six feet wide by 16 feet long along platform edge granite. Approved sample may be used in work.
   4. Certification:
      a. Master Grade Certificate: ANSI A137.1.
      b. Mortar and grout manufacturer's certification that materials furnished are suitable for intended use and meet specified requirements.
      c. Certified test reports by approved independent testing facility for specified properties and tests.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Deliver materials to site in original unopened moisture proof containers clearly labeled indicating manufacturer's name, type, grade and color.

B. Provide mortar and grout materials with labels certifying compliance with specifications and that they are of the types recommended by manufacturer for this application.

C. Store materials on pallets so as to prevent damage and moisture penetration.

D. Handle materials so as to prevent breakage of containers and damage to materials.

1.05 JOB CONDITIONS:

A. Environmental Conditions:
   1. Do not start paver-tile work unless the ambient temperature of the area in which the work occurs is at least 50F and rising and is maintained at not less than 50F without interruption while the work is being done and for at least 72 hours after completion of the work.

B. Substrate Conditions:
   1. Do not start paver-tile work unless surfaces to receive tile are in satisfactory condition.
   2. Commencement of paver-tile work constitutes Contractor's acceptance of the subfloor condition in accordance with ANSI A108-AN-2, General Requirement for Subsurfaces.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Paver Tile:
   1. Standard Grade, ANSI A137.1, Section 5.3, Paver Tile.
   2. ypes: Natural clay paver tile as follows:
      a. Hexagonal: Either nominal eight inches or nominal six inches across flats by 3/4 inch thick; flat face, cushion (not square) edges.
      b. Base: 8-inch by 12-inch by 3/4 inch thick.
      c. Stair treads and risers: Bullnose tread, sizes as shown.
   3. Face of tile: Unglazed, slip-resistant wearing surface integral with body of tile. Furnish tiles with or without embedded abrasive aggregate, as required to provide the specific minimum slip resistance specified below for each area of work.
   4. Backs: Raised pattern.
   5. Compressive strength: 8,000-psi, minimum.
   6. Slip Resistance: Minimum static coefficients of friction as required by the ADA, tested in accordance with ASTM C1028, but not less than the following:
      a. Level surfaces: 0.60 wet and dry.
      b. Ramps (slope greater than 1:20): 0.80 wet and dry.
      c. Stair treads: 0.80 wet and dry.
   7. Color and flash: Deep red color with factory-applied flash, matching samples on file with the Engineer. Make flashing natural in appearance across each paver unit; not linear, paint-like, or streaked; and with coverage varying from 10-percent to 50-percent of unit face area.
   8. Abrasive hardness: 50 or greater, ASTM C501.
   9. Water absorption: 0.5 percent to 3.0 percent, ASTM C373
   10. Dimensional tolerances:
      a. Thickness: 0.040 inch maximum range of thickness, ASTM C499.

b. Facial dimensions: 3.0 percent maximum facial-dimension variation, maximum 1.5-percent range of facial dimension variation; ASTM C499.
c. Warpage: 1.0 percent maximum along any edge, 0.75-percent maximum on either diagonal; ASTM C485.

B. Truncated Dome Quarry Tile:
1. Standard Grade, ANSI A137.1, Section 5.3, Paver Tile (not quarry tile).
2. Types: Natural clay paver tile as follows:
a. Domed form: Re-pressed tile to produce ADA-compliant raised domes.
1) Nominal six-inch square by 1/2-inch thick at base of domes; square edges; actual measurement maximum 5-3/4 inch by 5-3/4 inch.
2) Produce two projecting dome patterns, Style A and Style B, which are required to make a consistent ADA-required pattern for the detectable warning surface as shown.
b. Flat form: Nominal six-inch square tile by 1/2-inch thick; flat face, square edges; actual measurement maximum 5-3/4 inch by 5-3/4 inch.
3. Face of tile: Unglazed, slip-resistant wearing surface integral with body of tile. Furnish tiles with or without embedded abrasive aggregate, as required to provide the specific minimum slip resistance specified below for each area of work.
4. Backs: Raised pattern.
5. Compressive strength: 8,000-psi, minimum.
6. Slip Resistance: Minimum static coefficients of friction as required by the ADA, tested in accordance with ASTM C1028, but not less than the following:
a. Level surfaces: 0.60 wet and dry.
7. Color and flash: Deep red color with factory-applied flash, matching samples on file with the Engineer. Make flashing natural in appearance across each paver unit; not linear, paint-like, or streaked; and with coverage varying from 10-percent to 50-percent of unit face area.
8. Abrasive hardness: 50 or greater, ASTM C501.
9. Water absorption: 0.5 percent to 3.0 percent, ASTM C373
10. Dimensional tolerances:
a. Thickness: 0.040 inch maximum range of thickness, ASTM C499.
b. Facial dimensions: 3.0 percent maximum facial-dimension variation, maximum 1.5-percent range of facial dimension variation; ASTM C499.
c. Warpage: 1.0 percent maximum along any edge, 0.75-percent maximum on either diagonal; ASTM C485.

C. Tile Mortar:
1. Type 1: Latex-portland cement mortar, ANSI A118.4.
2. Type 2 (polyurethane adhesive): One-part or two-part polyurethane adhesive for exterior use, complying with the requirements of ASTM C836 and ANSI A136.1, with the following additional minimum requirements:
a. Shear strength, conditioned, dry; ANSI A136.1: 80 psi, no bond breakage.
b. Shear strength, conditioned, after water immersion; ANSI A136.1: 90 psi, no bond breakage.
c. Shear strength after accelerated aging; ANSI A136.1: 150 psi, no bond breakage.
d. Tensile bond strength: 350 psi minimum, for adhesive and for cohesive bond failure.
e. Viscosity: Non-sag, trowelable. If necessary to maintain viscosity at higher ambient temperatures, provide thickening agent which will not reduce required properties below the requirements.
f. Flammability when cured: Noncombustible.
g. Pot life: 60 minutes.
h. Primer: As recommended by manufacturer.

i. Sources: Subject to compliance with requirements, use one of the following or equal:
   1) FX-552 Tile Adhesive by Fox Industries, Baltimore, MD, 301/243-8856.
   2) Hydroment Ultra-Set by Bostik Division of Emhart, Huntington Valley, PA, 800/523-6530.
   3) Planicrete-W by MAPEI U.S.A., Elk Grove Village, IL, 800/426-2734.

D. Epoxy Mortar and Grout: ANSI A118.3.

E. Tile Grout:
1. Latex-portland-cement grout, ANSI A118.6.
2. Commercial portland-cement grout, presanded and pigmented. For narrow joints, grade sand to maximum sieve size as required to ensure full joints.
3. Latex manufactured or recommended by mortar and grout manufacturer; included in factory dry-mix or field-mixed with gauging liquid.
4. Color matching color of paver tile.

F. Polyurethane Sealant:
1. ASTM C920, Type M, Grade P or Grade NS as required for slope, Class 25, Use T.
2. Color matching grout color when moist.
3. Primer and joint cleaner: Use products recommended by sealant manufacturer, unless sealant manufacturer recommends against using primer and joint cleaner.

G. Sealant Backup Material: As recommended by the sealant manufacturer, and as required in Section 07900.

H. Expansion Joint Assembly: Sections 05810 and 05811.

I. Premolded Expansion-Joint Filler: AASHTO M153, Type I.

J. Concrete Overlay: Section 03300, Class 5000 concrete, pea gravel course aggregate 1/4-inch minimum to 3/8-inch maximum.

K. Mortar Bed for Bases: ANSI A108.1C.

L. Welded Steel-Wire Fabric: ASTM A185, size as shown.

M. Bond Breaker: Polyethylene sheeting, ASTM C171, minimum 0.004-inch thick.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. General Requirements:
1. Saw-cut paver tiles; breaking is prohibited.
2. Cutting domed tiles:
   a. Plan layout of tiles to avoid cuts through domes of domed tiles to the greatest extent possible. If domes are cut grind the remaining area around the domes flush with the flat face of the tiles.
3. Install paver tile on level surfaces and ramps to meet specified static coefficients of friction.
4. Lay out work in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings and movement-type joints.

5. Set truncated dome tiles, both domed and flat forms, with plastic joint spacers, except where such tiles are factory premounted at correct pattern and uniform spacing. Use two spacers along each side of a tile when field-setting. Remove spacers after mortar has fully cured, immediately prior to grouting.
6. Use grout of moist but stiff consistency, not a slurry. At narrow joints 1/4-inch and less, fill joints in two or more layers from bottom to top, applied before each layer cures, tooling each layer to compact grout and eliminate voids. At wider joints, fill in layers where needed and tool thoroughly to compact grout and prevent voids.
7. At sealant joints, execute work in accordance with Section 07900.

B. Latex Portland-Cement Mortar Method:
1. Use for installation of paver-tile only in fully enclosed areas without exposure to weather, such as below-grade platforms and mezzanines except where epoxy mortar method is required.
2. TCA Handbook Method F102 and ANSI A108.5, using tile mortar Type 1.
3. Obtain 100-percent contact with raised pattern back of tile with mortar by applying not less than 1/32-inch thick layer of mortar on back of each tile prior to placement in freshly notched mortar.
4. Grout installation: Use tile grout, ANSI A108.10.

C. Epoxy Mortar Method, ANSI A108.6:
1. Use for installation on metal surfaces.
2. Follow mortar manufacturer's recommendations.

D. Polyurethane Adhesive Method:
1. Use for installation of paver tile work wholly or partly exposed to weather, except where epoxy mortar method is required.
2. TCA Handbook Method F102-98 and ANSI A108.4, using tile mortar Type 2 and as follows, except as otherwise necessary to comply with the printed instructions of the polyurethane-adhesive manufacturer.
    a. Prime substrate surface in accordance with manufacturer's instructions before applying polyurethane adhesive. Primer is required unless manufacturer provides written certification recommending against priming.
    b. Allow primer to dry for 12 hours before applying polyurethane adhesive, unless otherwise recommended in writing by manufacturer.
    c. Use the manufacturers recommended filler in the polyurethane adhesive so as to thicken adhesive sufficiently to accomplish the required application and also to accomplish filling the raised pattern back of tile with adhesive prior to placement. Adjust quantity of filler for the ambient temperature as instructed by manufacturer of adhesive.
    d. Obtain 100 percent coverage of substrate with the adhesive, which also functions as a membrane waterproofing, in accordance with ANSI A108.4.Use no more mortar than is necessary to obtain adhesion and coating of substrate. Remove excess mortar between tiles and from sides of joints to accommodate grouting for full depth of tile.
    e. Before allowing pedestrian traffic, allow set tiles to cure for 24 hours in temperatures between 60F and 90F. At temperatures between 50F and 60F, allow 72 hours.
3. Grout installation: Use tile grout; ANSI A108.10.

E. Portland Cement Mortar Bed Method:
1. Use for installation of paver tile base and wall finish.
2. TCA Handbook Method W221-98 and ANSI A108.1C and A108.10.
3. Back-butter tile with bond coat before setting.

3.02 MAINTENANCE MATERIALS:

A. Furnish one-percent extra paver tile of each type and style.

B. Store tile in original containers, clearly marked as to contents and area of placement, in location directed.

END OF SECTION

SECTION 09511

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies providing lay-in acoustical panels and exposed suspension systems.

B. Related Work Specified Elsewhere:
   1. Acoustical Snap-In Metal Pan Ceilings: Section 09513.

1.02 DEFINITIONS:

A. CAC: Ceiling Attenuation Class.

B. LR: Light Reflectance coefficient.

C. NRC: Noise Reduction Coefficient.

1.03 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
   1. Product Data: For each type of product specified provide manufacturer's printed product information including maintenance information.
   2. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
      a. Ceiling suspension system members.
      b. Method of attaching suspension system hangers to building structure.
      c. Ceiling-mounted items including light fixtures; air outlets and inlets; speakers; sprinklers; and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
      d. Minimum Drawing Scale: 1/8 inch = 1 foot.
   3. Samples for Initial Selection: Manufacturer's color charts consisting of actual acoustical panels or sections of acoustical panels, suspension systems, and moldings showing the full range of colors, textures, and patterns available for each type of ceiling assembly indicated.
   4. 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. Provide three of each type.
      a. Full-size samples of each acoustical panel type, pattern, and color.
      b. Set of 12-inch-long samples of exposed suspension system members, including moldings, for each color and system type required.
      c. Fasteners: Each type.
      d. Accessories.
   5. Product Test Reports: Indicate compliance of acoustical panel ceilings and components with requirements based on comprehensive testing of current products.

1.04 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Codes and regulations of the jurisdictional authorities.

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies providing rubber floor covering, vinyl composition floor tile, vinyl wall base, rubber stair treads and accessories.

1.02 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
   1. Product Data: For each type of product specified provide manufacturer's printed product information.
   2. 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.
   3. Samples for Verification: Four of each type, color and pattern of the following materials used in the Work, showing the full range of variations expected:
      a. Floor Tile: 12 inches square.
      b. Wall Base: 12 inches long.
      c. Edge Strips: 12 inches long.
      d. Adhesive: Pint container.
   4. Product Certificates: Signed by manufacturers of resilient products certifying that each product furnished complies with requirements.
   5. Maintenance Data: For each type of product specified.

1.03 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. ASTM: D2240, E648, E662, F710, F1066, F1344.
   3. FS: RR-T-650, SS-T-312, SS-W-40, UU-B-790.

B. 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.

C. 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.

D. Fire-Test-Response Characteristics: Provide products with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Critical Radiant Flux: 0.45 W/sq. cm or greater when tested per ASTM E648.
   2. Smoke Density: Maximum specific optical density of 450 or less when tested per ASTM E662.

1.04 DELIVERY, STORAGE, AND HANDLING:

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies providing rubber floor covering, vinyl composition floor tile, vinyl wall base, rubber stair treads and accessories.

1.02 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
   1. Product Data: For each type of product specified provide manufacturer's printed product information.
   2. 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.
   3. Samples for Verification: Four of each type, color and pattern of the following materials used in the Work, showing the full range of variations expected:
      a. Floor Tile: 12 inches square.
      b. Wall Base: 12 inches long.
      c. Edge Strips: 12 inches long.
      d. Adhesive: Pint container.
   4. Product Certificates: Signed by manufacturers of resilient products certifying that each product furnished complies with requirements.
   5. Maintenance Data: For each type of product specified.

1.03 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. ASTM: D2240, E648, E662, F710, F1066, F1344.
   3. FS: RR-T-650, SS-T-312, SS-W-40, UU-B-790.

B. 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.

C. 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.

D. Fire-Test-Response Characteristics: Provide products with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Critical Radiant Flux: 0.45 W/sq. cm or greater when tested per ASTM E648.
   2. Smoke Density: Maximum specific optical density of 450 or less when tested per ASTM E662.

1.04 DELIVERY, STORAGE, AND HANDLING:

SECTION 09920

FIELD PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section specifies furnishing and applying paint at the site.
   1. Specific surfaces and areas which require field painting and required paint systems are listed in the schedule of painting.
   2. Unless an item is shown not to be field painted or specified otherwise paint it in accordance with these specifications.

B. Definitions:
   1. Paint: Includes primers and undercoaters, sealers, stains, paint, varnish, enamel, epoxy and special coatings.

C. Items Not Included In Field Painting:
   1. Stainless steel, ornamental metals, glass, resilient tile, ceramic tile, paving, acoustical tile, plastic laminate and similar items which are prefinished.
   2. Mill-, factory- and shop-applied primers and finishes.
   3. Corrosion-resistant structural steel, ASTM A242.
   4. High-strength structural corrosion-resistant steel shapes, plates and bars, ASTM A588.
   5. Galvanized-metal surfaces..~~except fire stand pipes, unless exposed to public view.~~
   6. UL labels on fire-rated doors and frames.
   7. Precast or prestressed concrete with a sandblast finish, concrete sealer, or other special finish unless noted otherwise

D. Related Work Specified Elsewhere:
   1. Mill-, factory- and shop-applied prime and finish coats: Specified with the product.

1.02 SUBMITTALS:

A. Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:
   1. Samples:
      a. Three each of each color and texture, with identification of materials keyed to those specified and application methods.
      b. Samples of paint scheduled for application to smooth finishes applied to 12-inch square hardboard or metal panels.
      c. Samples of paint scheduled for application to concrete masonry units applied to 16-inch square by two-inch thick panel of concrete masonry units, including one tooled masonry joint. Subdivide panel to define prime or filler, intermediate and finish coats.

1.03 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. FS: TT-E-489, TT-E-490, TT-E-509, TT-F-336, TT-F-1098, TT-P-19, TT-P-29, TT-P-636, TT-P-641, TT-P-645, TT-P-650, TT-P-664, TT-P-1510, TT-P-001984, TT-S-71, TT-S-300, TT-V-86, TT-V-119.
   3. ASME: A13.1.

4. ANSI: Z535.1.
5. ASTM: A242, A588, B117, C476, C920.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Deliver products to the jobsite in their original unopened containers clearly labeled with the manufacturer's name and brand designation, referenced specification number and type, as applicable.

B. Store products in an approved ventilated dry area, protect from contact with soil and from exposure to the elements. Always keep products dry. Do not allow paint to freeze.

C. Handle products in a manner that will prevent breakage of containers and damage to products.

1.05 JOB CONDITIONS:

A. Environmental Requirements:
1. Do not apply paint to non-protected surfaces in wet weather or to surfaces on which ice, frost, water or dampness is visible.
2. Do not apply exterior paint when the temperature is below 40F or expected to fall below this temperature. Do not apply interior paint when the temperature is lower than 60F or expected to fall below this temperature.
3. Avoid painting steel which is at a temperature which can cause blistering, porosity, or otherwise be detrimental to the life of the paint. When paint is applied in hot weather or thinned in cold weather ensure that the specified thickness of paint coating is obtained.
4. Do not apply paint in rain, wind, snow, fog or mist or when the steel surface temperature is below the dew point, resulting in condensation of moisture.
5. Do not apply interior paint when, in the Engineer's opinion, satisfactory results cannot be obtained due to high humidity and excessive temperature; however, failure of the Engineer to notify the Contractor of the conditions will not relieve the Contractor of responsibility to produce satisfactory results.

PART 2 - PRODUCTS

2.01 GENERAL:

A. To the maximum extent practicable, use the materials of one manufacturer throughout the project. No claims as to the suitability of a material specified, or of inability to produce first-class work with these materials, will be considered unless such claims are made in writing and submitted with the Contractor’s Bid Proposal.

B. Provide a primer suitable for each substrate type and which is manufactured or recommended by the paint manufacturer as part of a complete painting system.

C. Previously Primed Surfaces:
1. If surfaces have been primed off-site at the mill, factory or shop, omit specified primer, but only if the off-site primer is acceptable to the paint system manufacturer for best performance of the specified paint system.
2. For touch-up of off-site primer, use primer of the same composition as the mill, factory or shop primer.

D. VOC Requirements: Provide products in compliance with local volatile organic compound regulations. If the listed product of a manufacturer does not comply, provide an accepted equivalent product which does comply.

E. Colors:
1. Prior to beginning work, the Contractor will be furnished sample color chips and a Color and Material Schedule for surfaces to be painted.
2. Match the colors of the chips and submit samples before proceeding. Label samples for surface finishes such as satin, flat or gloss as listed in the Color and Material Schedule.
3. Tint each coat of paint slightly lighter or darker than the preceding coat or the finish coat.
4. Final approval of colors will be made by the Engineer on samples applied on the job.
5. Safety Colors: Items specified to be safety colors, e.g. OSHA red (safety red) and ANSI orange, to be in compliance with ANSI Z535.1, Safety Color Code.

F. Listed materials are a guide to quality intended. Substitute materials and paint systems acceptable to the Engineer, as an equal or of superior quality for each intended use, may be used in the work at no additional cost to the Authority.

G. Accessory Materials:
1. General: Provide miscellaneous materials and accessories, whether listed or not, as necessary to complete the work in an approved manner.
2. Caulk: Single-component, chemically curing, synthetic rubber, non-sag, ASTM C920, Type S, NS, Class 25.
3. Spackling compound: Ready-mixed type, U.S. Gypsum Ready-Mixed Joint Compound - Topping, ASTM C476 or equal.
4. Thinner: As recommended by the paint manufacturer.

2.02 EXTERIOR PAINTING SYSTEMS:

A. Exterior Paint Schedule: Provide the paint systems scheduled below for the various substrates, as indicated. Provide a complete paint system by one manufacturer for each substrate. Unless otherwise indicated, provide the following:
1. Concrete and masonry (except concrete masonry units): Acrylic, flat.
2. Concrete masonry units: Acrylic, flat.
3. Portland cement plaster (soffits): Acrylic, flat.
4. Ferrous metal: Silicone-alkyd, semigloss.
5. Zinc-coated metal: Silicone-alkyd, semigloss.
6. Aluminum: Alkyd, semigloss.
7. Wood: Acrylic-enamel, semigloss.
8. Mechanical and electrical items (not finish painted): See substrate materials above.

B. Concrete, Masonry (except concrete masonry units), and portland cement plaster - Acrylic, Flat: Two coats with total dry film thickness not less than 2.5 mils.
1. Undercoat: Quick-drying, flat, acrylic paint for use on the exterior over concrete, masonry, and portland cement plaster (FS TT-P-19):
a. Con-Lux: Mason-Plex 800 Series.
b. Devoe: 15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
c. Moore: Moore's Flat Exterior Latex Masonry & House Paint #105.
2. S-W:A-100 Acrylic Latex Flat Exterior Finish, A-6 Series.Finish Coat: Quick-drying, flat, acrylic paint for use on the exterior over concrete, masonry, and portland cement plaster (FS TT-P-19)
a. Con-Lux: Mason-Plex 800 Series.

b. Devoe: 15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
c. Moore: Moore's Flat Exterior Latex Masonry & House Paint #105.
d. S-W: A-100 Acrylic Latex Flat Exterior Finish, A-6 Series.

C. Concrete Masonry Units - Acrylic, Flat: Two coats over block filler with total dry film thickness not less than 2.5 mils, excluding the block filler.
1. Block Filler: High performance latex block filler used for filling open textured concrete masonry block before application of top coats:
a. Con-Lux: Block-Plex 85 White.
b. Devoe: 52901 Bloxfil Acrylic Latex Block Filler.
c. Moore: Moorcraft Block Filler #145.
d. S-W: Heavy-Duty Block Filler B42W46.
2. Undercoat: Quick-drying, flat, acrylic paint for use on the exterior over concrete masonry block (FS TT-P-19):
a. Con-Lux: Mason-Plex 800 Series.
b. Devoe: 15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
c. Moore: Moore's Flat Exterior Latex Masonry & House Paint #105.
d. S-W: A-100 Acrylic Latex Flat Exterior Finish, A-6 Series.
3. Finish Coat: Quick-drying, flat, acrylic paint for use on the exterior over concrete masonry block (FS TT-P-19):
a. Con-Lux: Mason-Plex 800 Series.
b. Devoe: 15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
c. Moore: Moore's Flat Exterior Latex Masonry & House Paint #105.
d. S-W: A-100 Acrylic Latex Flat Exterior Finish, A-6 Series

D. Ferrous Metal - Silicone-Alkyd, Semigloss: Two coats over primer.(Apply a second coat of primer on steel which is at grade, at slab, or passing through floor slabs. Apply to a uniform line six inches above top of grade or slab.)
1. Primer: Lead and chromate-free high solids primer which chemically inhibits rusting and is recommended by the manufacturer for application to steel which has been prepared in accordance with SSPC SP2. Rated 10 (less than 0.01% surface rusting) when tested in accordance with ASTM B117 for 500 hours. Exceeds performance requirements of FS TT-P-636:
a. Con-Lux: Rust Arrestor 50.
b. S-W: Kem Kromik Universal Metal Primer B50NZ6.
c. Tnemec: Series P10.
2. Undercoat: Alkyd enamel recommended by manufacturer of finish coat as an intermediate coat over specified primer for application of silicone-alkyd finish coat:
a. Con-Lux: Ferrox Primer.
b. S-W: Silicone Alkyd Enamel B-56 Series.
c. Tnemec: Series 23 Enduratone.
3. Finish Coat: Silicone-alkyd enamel with a minimum of 30% silicone content meeting the qualitative requirements of FS TT-E-490:
a. Con-Lux: Steel-Master 9500 Series.
b. S-W: Silicone Alkyd Enamel B-56 Series.
c. Tnemec: Series 82 Silicone-Alkyd Enamel.

E. Ferrous Metal - Alkyd, Semigloss: Two coats over primer (primer is not required on shop-primed items):
1. Primer: Quick-drying, rust-inhibiting primer for priming ferrous metal under alkyd enamel (FS TT-P-664):
a. Con-Lux: Ferrox Primer, 25 Red.
b. Devoe: 41820 Bar-Ox Alkyd Shop/Field Primer.

c. Moore: Ironclad Retardo Rust-Inhibitive Paint #163.
d. S-W: Kem Kromik Metal Primer B50N2/B50W1.

2. Undercoat: Weather-resistant, air-drying, semigloss alkyd enamel for use on the exterior over prime-coated ferrous metal (FS TT-E-489, Class A):
a. Con-Lux: Enamelite Semi-Luster Series
b. Devoe: 70XX Mirrolac Interior/Exterior Alkyd Enamel.
c. Moore: Impervo Enamel #133.
d. S-W: Industrial Enamel, B-54Z Series.

3. Finish Coat: Weather-resistant, air-drying, semigloss alkyd enamel for use on the exterior over prime-coated ferrous metal (FS TT-E-489, Class A):
a. Con-Lux: Enamelite Semi-Luster Series.
b. Devoe: 70XX Mirrolac Interior/Exterior Alkyd Enamel.
c. Moore: Impervo Enamel #133.
d. S-W: Industrial Enamel, B-54Z Series.

~~F. Zinc-Coated Metal - Silicone-Alkyd, Semigloss: Two coats over factory-applied primer:~~
~~1. Primer: Galvanized metal primer used to prime zinc-coated (galvanized) metal surfaces (FS TT-P-641), or one of the following.~~
~~a. Con-Lux: Bond-Plex 46 Barrier Green.~~
~~b. Devoe: 13201 Mirrolac Galvanized Metal Primer.~~
~~c. Moore: Ironclad Galvanized Metal Latex Primer #155.~~
~~d. S-W: Industrial Water Based Acrylic Paint B42W110.~~
~~2. Undercoat: Alkyd enamel recommended by manufacturer of finish coat as an intermediate coat over factory-applied primer for application of silicone-alkyd finish coat:~~
~~a. Con-Lux: Ferrox Primer.~~
~~b. S-W: Silicone Alkyd Enamel B-56 Series.~~
~~c. Tnemec: Series 23 Enduratone.~~
~~3. Finish Coat: Silicone-alkyd enamel with a minimum of 30% silicone content meeting the qualitative requirements of FS TT-E-490:~~
~~a. Con-Lux: Steel-Master 9500 Series.~~
~~b. S-W: Silicone Alkyd Enamel B-56 Series.~~
~~c. Tnemec: Series 82 Silicone-Alkyd Enamel.~~

~~G. Zinc-Coated Metal - Alkyd, Semigloss: Two coats over primer:~~
~~1. Primer: Galvanized metal primer used to prime zinc-coated (galvanized) metal surfaces (FS TT-P-641), or one of the following:~~
~~a. Con-Lux: Bond-Plex 46 Barrier Green.~~
~~b. Devoe: 13201 Mirrolac Galvanized Metal Primer.~~
~~c. Moore: Ironclad Galvanized Metal Latex Primer #155.~~
~~d. S-W: Industrial Water Based Acrylic Paint B42W110.~~
~~2. Undercoat: Weather-resistant, air-drying, semigloss alkyd enamel for use on the exterior over prime-coated zinc-coated (galvanized) metal (FS TT-E-489, Class A):~~
~~a. Con-Lux: Enamelite Semi-Luster Series.~~
~~b. Devoe: 70XX Mirrolac Interior/Exterior Alkyd Enamel.~~
~~c. Moore: Impervo Enamel #133.~~
~~d. S-W: Industrial Enamel, B-54Z Series.~~
~~3. Finish Coat: Weather-resistant, air-drying, semigloss alkyd enamel for use on the exterior over prime-coated zinc-coated (galvanized) metal (FS TT-E-489, Class A):~~
~~a. Con-Lux: Enamelite Semi-Luster Series.~~
~~b. Devoe: 70XX Mirrolac Interior/Exterior Alkyd Enamel.~~
~~c. Moore: Impervo Enamel #133.~~
~~d. S-W: Industrial Enamel, B-54Z Series.~~

H. Aluminum - Alkyd, Semigloss: Two coats over primer:

1. Primer: Alkyd-type zinc chromate primer used for priming aluminum under alkyd enamels (FS TT-P-645), or one of the following.
   a. Con-Lux: Bond-Plex 46 Barrier Green.
   b. Devoe: 41839 Bar-Ox Zinc Chromate Primer.
   c. Moore: Ironclad Retardo Rust Inhibitive Paint #163.
   d. S-W: Zinc Chromate Primer B50Y1.
2. Undercoat: Weather-resistant, air-drying, semigloss alkyd enamel for use on the exterior over prime-coated aluminum (FS TT-E-489, Class A):
   a. Con-Lux: Enamelite Semi-Luster Series.
   b. Devoe: 70XX Mirrolac Interior/Exterior Alkyd Enamel.
   c. Moore: Impervo Enamel #133.
   d. S-W: Industrial Enamel, B-54Z Series.
3. Finish Coat: Weather-resistant, air-drying, semigloss alkyd enamel for use on the exterior over prime-coated aluminum (FS TT-E-489, Class A):
   a. Con-Lux: Enamelite Semi-Luster Series
   b. Devoe: 70XX Mirrolac Interior/Exterior Alkyd Enamel.
   c. Moore: Impervo Enamel #133.
   d. S-W: Industrial Enamel, B-54Z Series.

I. Wood - Acrylic Enamel, Semigloss: Two coats over primer with total dry film thickness not less than 2.5 mils:
1. Primer: Exterior alkyd or latex primer made for use on wood under an acrylic enamel (FS TT-P-001984):
   a. Con-Lux: Wood-Plex 700 Primer.
   b. Devoe: 1102 All-Weather Exterior Alkyd House Paint Primer.
   c. Moore: Moorwhite Primer #100.
   d. S-W: A-100 Exterior Latex Wood Primer
2. Undercoat: Semigloss, waterborne, exterior, acrylic enamel made for use as an undercoat over a primer on wood under an acrylic enamel (FS TT-P-1510):
   a. Con-Lux: Weather-Plex 700 Series
   b. Devoe: 17XX Wonder-Shield Semi-Gloss Exterior Acrylic latex House and Trim Paint.
   c. Moore: MoorGlo Latex House and Trim Paint #096.
   d. S-W: A-100 Exterior Latex Satin.
3. Finish Coat: Semigloss, waterborne, exterior, acrylic enamel made for use as a finish coat over an acrylic enamel (FS TT-P-1510):
   a. Con-Lux: Weather-Plex 700 Series.
   b. Devoe: 17XX Wonder-Shield Semi-Gloss Exterior Acrylic latex House and Trim Paint.
   c. Moore: MoorGlo Latex House and Trim Paint #096.
   d. S-W: A-100 Exterior Latex Satin.

J. Wood - Stained-Varnish: Two coats over sealer over stain plus filler on open-grain wood. Wipe filler before applying first varnish coat.
1. Stain Coat: Match interior stained-varnish finish.
2. Sealer: Phenolic varnish for use on exterior natural-finished woodwork (FS TT-V-119), thinned as recommended by manufacturer:
   a. Con-Lux: Imperial 71 Spar Varnish.
   b. Devoe: 87 Spar Varnish.
   c. Moore: Impervo 440 Spar Varnish.
   d. S-W: Exterior Varnish A67V4
3. Undercoat: Phenolic varnish for use on exterior natural-finished woodwork (FS TT-V-119):
   a. Con-Lux: Imperial 71 Spar Varnish.
   b. Devoe: 87 Spar Varnish.
   c. Moore: Impervo 440 Spar Varnish.

d. S-W: Exterior Varnish A67V4.

4. Finish Coat: Phenolic varnish for use on exterior natural-finished woodwork (FS TT-V-119):
   a. Con-Lux: Imperial 71 Spar Varnish.
   b. Devoe: 87 Spar Varnish.
   c. Moore: Impervo 440 Spar Varnish.
   d. S-W: Exterior Varnish A67V4.

2.03 INTERIOR PAINTING SYSTEMS:

A. Interior Paint Schedule: Provide the paint systems scheduled below for the various substrates, as indicated. Provide a complete paint system by one manufacturer for each substrate. Unless otherwise indicated, provide the following:
   1. Concrete and masonry (except concrete masonry units and concrete floors): Latex, flat.
   2. Concrete masonry units (except ground-faced CMU, which is to be left unpainted): Latex, flat.
   3. Concrete floors: Epoxy, gloss, with anti-slip aggregate.
   4. Gypsum plaster, veneer plaster, and GFRG: Latex, eggshell.
   5. Acoustical plaster: Unpainted.
   6. Gypsum board: Latex, flat.
   7. Woodwork: Stained-varnish finish, except alkyd, semigloss where painted is indicated.
   8. Ferrous metal:
      a. Exposed steel structure: Silicone-alkyd, semigloss.
      b. Other interior ferrous metal: Alkyd, semigloss.
   9. Zinc-coated metal: Alkyd, semigloss; except silicone-alkyd where part of ferrous metal assemblies painted with silicone-alkyd.
   10. Non-ferrous metal: Alkyd, semigloss.
   11. Cotton and canvass covering over insulation: Latex, flat.
   12. Mechanical and electrical items (not finish painted): See substrate materials above.

B. Concrete and Masonry (Except concrete masonry units) - Latex, Flat: Two coats.
   1. Undercoat: Flat latex-based paint made for use as an undercoat over concrete and masonry under a flat latex paint (FS TT-P-29):
      a. Con-Lux: Jet-Plex 495 Primer.
      b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
      c. Moore: Moore's Latex Quick-Dry Prime Seal 201.
      d. S-W: Pro-Mar 200 Latex Flat B30W200.
   2. Finish Coat: Flat latex-based paint made for use as a flat finish over concrete and masonry (FS TT-P-29):
      a. Con-Lux: Wall-Plex 400 Series.
      b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
      c. Moore: Regal Wall Satin 215.
      d. S-W: Pro-Mar 200 Latex Flat Wall Paint B30W200 Series.

C. Concrete and Masonry (Except concrete masonry units) - Alkyd, Semigloss: Two coats over primer with total dry film thickness not less than 3.5 mils.
   1. Primer: Flat latex-based paint made for use as a primer over concrete and masonry under an odorless alkyd enamel (FS TT-P-29):
      a. Con-Lux: Wall-Plex 400 Series.
      b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
      c. Moore: Moore's Latex Quick-Dry Prime Seal 201.
      d. S-W: Pro-Mar 200 Latex Flat B30W200.

2. Undercoat: Enamel undercoat made for use on the interior as an undercoat over a primer on concrete or masonry under an odorless alkyd enamel:
   a. Con-Lux: Enamel Underbase 54 White.
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
   c. Moore: Moore's Alkyd Enamel Underbody 217.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.
3. Finish Coat: Semigloss odorless alkyd enamel made for use over a primer and undercoat on concrete and masonry (FS TT-E-509):
   a. Con-Lux: Satin-Lite 900 Series
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
   c. Moore: Moore's Satin Impervo Enamel 235.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.

D. Concrete and Masonry (Except concrete masonry units) - Epoxy, Semi-Gloss: Two coats over primed surface.
1. Primer: Sealer made for use as a primer over masonry wall surfaces and under an epoxy enamel:
   a. Con-Lux: Jet-Plex 495 Primer.
   b. Duron: Acrylic Enamel Undercoater.
   c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
   d. S-W: Kem Cati-Coat Epoxy Filler/Sealer.
2. Undercoat: Epoxy enamel undercoat made for use under a semi-gloss epoxy enamel:
   a. Con-Lux: Epolon Semi-Luster Series.
   b. Duron: Polyamide Epoxy.
   c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
   d. S-W: Heavy Duty Epoxy.
3. Finish Coat: Semi-gloss epoxy enamel finish coat made for use over an epoxy enamel undercoat:
   a. Con-Lux: Epolon Semi-Luster Series.
   b. Duron: Polyamide Epoxy.
   c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
   d. S-W: Heavy Duty Epoxy.

E. Concrete Masonry Units (Except ground-faced CMU, which is to be left unpainted) - Latex, Flat: Two coats over filled surface.
1. Block Filler: High-performance latex block filler made for use for filling open textured concrete masonry block before application of top coats (FS TT-F-1098):
   a. Con-Lux: Block-Plex 85 White.
   b. Devoe: 52901 Bloxfil Acrylic Latex Block Filler.
   c. Moore: Moorcraft Interior and Exterior Block Filler 173.
   d. S-W: Heavy-Duty Block Filler B42W46.
2. Undercoat: Flat latex-based paint made for use as an undercoat over filled concrete masonry block under a flat latex paint (FS TT-P-29):
   a. Con-Lux: Wall-Plex 400 Series.
   b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
   c. Moore: Moore's Latex Quick-Dry Prime Seal 201.
   d. S-W: Pro-Mar 200 Latex Flat B30W200.
3. Finish Coat: Flat latex-based Paint made for use as a flat finish over filled concrete masonry block (FS TT-P-29):
   a. Con-Lux: Wall-Plex 400 Series.
   b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
   c. Moore: Regal Wall Satin 215.
   d. S-W: Pro-Mar 200 Latex Flat Wall Paint B30W200 Series.

F. Concrete Masonry Units (Except ground-faced CMU, which is to have clear anti-graffiti coating over unfilled surface) - Alkyd, Semigloss: Two coats over filled surface with total dry film thickness not less than 3.5 mils, excluding filler coa

1. Block Filler: High-performance latex block filler made for use for filling open textured concrete masonry block before application of top coats (FS TT-F-1098):
   a. Con-Lux: Block-Plex 85 White.
   b. Devoe: 52901 Bloxfil Acrylic Latex Block Filler.
   c. Moore: Moorcraft Interior and Exterior Block Filler 173.
   d. S-W: Heavy-Duty Block Filler B42W46.
2. Undercoat: Enamel undercoat made for use on the interior as an undercoat over a block filler on concrete masonry block under an odorless alkyd enamel:
   a. Con-Lux: Enamel Underbase 54 White.
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
   c. Moore: Moore's Alkyd Enamel Underbody 217.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.
3. Finish Coat: Semigloss odorless alkyd enamel made for use over a block filler and undercoat on concrete masonry block (FS TT-E-509):
   a. Con-Lux: Satin-Lite 900 Series.
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
   c. Moore: Moore's Satin Impervo Enamel 235.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.

G. Concrete Masonry Units (Except ground-faced CMU, which is to have clear anti-graffiti coating over unfilled surface) - Epoxy, Semi-Gloss: Two coats over filled surface.

1. Filler:Filler made for use as a primer over masonry wall surfaces and under an epoxy enamel:
   a. Con-Lux: Jet-Plex 495 Primer; or Block-Plex Block Filler.
   b. Duron: Acrylic Enamel Undercoater; or Block Kote Latex Block Filler.
   c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel; or Moorcraft Interior and Exterior Block Filler.
   d. S-W: Kem Cati-Coat Epoxy Filler/Sealer; or Heavy Duty Block Filler.
2. Undercoat: Epoxy enamel undercoat made for use under a semi-gloss epoxy enamel:
   a. Con-Lux: Epolon Semi-Luster Series.
   b. Duron: Polyamide Epoxy.
   c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
   d. S-W: Heavy Duty Epoxy.
3. Finish Coat: Semi-gloss epoxy enamel finish coat made for use over an epoxy enamel undercoat:
   a. Con-Lux: Epolon Semi-Luster Series.
   b. Duron: Polyamide Epoxy
   c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
   d. S-W: Heavy Duty Epoxy.

H. Concrete Floor Surfaces - Epoxy, Gloss: Two coats over primer, with anti-slip aggregate in finish coat:

1. Primer: Epoxy sealer made for use as a primer over concrete floor surfaces and under an epoxy enamel:
   a. Con-Lux: None required.
   b. Duron: Acrylic Enamel Undercoater
   c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
   d. S-W: ArmorSeal 3300LV Epoxy Primer/Sealer.
2. Undercoat: Epoxy enamel undercoat made for use over an epoxy primer and under a gloss epoxy enamel:

a. Con-Lux: Epolon Series with Epolon 145 Reducer.
b. Duron: Polyamide Epoxy.
c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
d. S-W: ArmorSeal 1000HS.

3. Finish Coat: Epoxy enamel finish coat made for use over an epoxy enamel undercoat:
a. Con-Lux: Epolon Series with anti-slip aggregate.
b. Duron: Polyamide Epoxy with anti-slip aggregate.
c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel with anti-slip aggregate.
d. S-W: ArmorSeal 1000HS with anti-slip aggregate.

I. Gypsum Plaster, Veneer Plaster, and GFRG - Latex, Eggshell (Low-Gloss): Two coats over primer; plus sealer for GFRG.

1. Sealer for GFRG: Same as primer coat, to expose hot spots and facilitate sanding to remove "fiber bloom".
2. Primer: Flat latex-based paint made for use as a primer on plaster under an eggshell latex paint (FS TT-P-29):
a. Con-Lux: Jet-Plex 495 Primer.
b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
c. Moore: Moore's Latex Quick-Dry Prime Seal 201.
d. S-W: Wall and Wood Primer B99WZ2.
3. Undercoat: Eggshell latex paint made for use over a primer on plaster (Performance requirements of FS TT-P-29):
a. Con-Lux: Luster-Plex 2000 Series.
b. Devoe: 34XX Wonder-Tones Interior Latex Eggshell Enamel.
c. Moore: Regal AquaVelvet 319.
d. S-W: Pro-Mar 200 Latex Eggshell Enamel B20W200 Series.
4. Finish Coat: Eggshell latex paint made for use over a primer and undercoat on plaster (Performance requirements of FS TT-P-29):
a. Con-Lux: Luster-Plex 2000 Series.
b. Devoe: 34XX Wonder-Tones Interior Latex Eggshell Enamel.
c. Moore: Regal AquaVelvet 319.
d. S-W: Pro-Mar 200 Latex Eggshell Enamel B20W200 Series.

J. Gypsum Plaster, Veneer Plaster, and GFRG - Alkyd, Semigloss: Two coats over primer with total dry film thickness not less than 2.5 mils; plus sealer for GFRG.

1. Sealer for GFRG: Same as primer coat, to expose hot spots and facilitate sanding to remove "fiber bloom".
2. Primer: Flat latex-based paint made for use as a primer on plaster under an odorless alkyd enamel (FS TT-P-29):
a. Con-Lux: Jet-Plex 495 Primer.
b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
c. Moore: Moore's Latex Quick-Dry Prime Seal 201.
d. S-W: Wall and Wood Primer B99WZ2.
3. Undercoat: Enamel undercoat made for use as an undercoat over a primer on plaster under an odorless alkyd enamel:
a. Con-Lux: Enamel Underbase 54 White.
b. Devoe: 26XX Velour Alkyd Semigloss Enamel
c. Moore: Moore's Alkyd Enamel Underbody 217.
d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series
4. Finish Coat: Semigloss odorless alkyd enamel made for use over a primer and undercoat on plaster (FS TT-E-509):
a. Con-Lux: Satin-Lite 900 Series.
b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
c. Moore: Moore's Satin Impervo Enamel 235.

d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.

K. Gypsum Board - Latex, Flat: 1 coat over primer.
1. Primer: Latex-based white primer made for use on interior gypsum board under a flat latex paint (FS TT-P-650):
a. Con-Lux: Jet-Plex 495 Primer.
b. Devoe: 50801 Wonder-Tones Latex Primer and Sealer.
c. Moore: Moore's Latex Quick-Dry Prime Seal 201.
d. S-W: Pro-Mar 200 Latex Wall Primer B28W200.
2. Finish Coat: Flat latex-based paint made for use as a flat finish over prime-coated gypsum board (FS TT-P-29):
a. Con-Lux: Wall-Plex 400 Series.
b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
c. Moore: Regal Wall Satin 215.
d. S-W: Pro-Mar 200 Latex Flat Wall Paint B30W200 Series.

L. Gypsum Board - Alkyd, Semigloss: Two coats over primer with total dry film thickness not less than 2.5 mils.
1. Primer: Latex-based white primer made for use on interior gypsum board under an odorless alkyd enamel (FS TT-P-650):
a. Con-Lux: Jet-Plex 495 Primer.
b. Devoe: 50801 Wonder-Tones Latex Primer and Sealer.
c. Moore: Moore's Latex Quick-Dry Prime Seal 201.
d. S-W: Pro-Mar 200 Latex Wall Primer B28W200.
2. Undercoat: Enamel undercoat made for use on the interior as an undercoat over a primer on interior gypsum board under an odorless alkyd enamel:
a. Con-Lux: Enamel Underbase 54 White.
b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
c. Moore: Moore's Alkyd Enamel Underbody 217.
d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.
3. Finish Coat: Semigloss odorless alkyd enamel made for use over a primer and undercoat on interior gypsum board (FS TT-E-509):
a. Con-Lux: Satin-Lite 900 Series.
b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
c. Moore: Moore's Satin Impervo Enamel 235.
d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.

M. Woodwork, Stained-Varnish: Two coats over sealer over stain plus filler on open-grain wood. Wipe filler before applying first varnish coat.
1. Stain Coat: Slow-penetrating oil-type wood stain made for general use on interior wood surfaces under a varnish finish (FS TT-S-71):
a. Devoe: 96XX Wonder Woodstain Alkyd Stain.
b. Moore: Moore's Interior Wood Finishes Penetrating Stain 241.
c. S-W: Oil Stain A-48 Series.
2. Sealer: Quick-drying, rosin-free, clear, general-purpose shellac varnish made for use on the interior over stained-finished woodwork under a varnish finish (FS TT-S-300, Grade A):
a. Devoe: 4900 Wonder Woodsealer Quick-Dry Sealer.
b. Moore: Moore's Interior Wood Finishes, Quick-Dry Sanding Sealer 413.
c. S-W: Pro-Mar Varnish Sanding Sealer B26V3.
3. Filler: Solvent-based, air-drying, paste-type wood filler made for use on open-grain wood on interior wood surfaces (FS TT-F-336):
a. Devoe: 4800 Wonder Woodstain Interior Paste Wood Filler.
b. Moore: Benwood Paste Wood Filler.
c. S-W: Sher-Wood Fast-Dry Filler.

4. Undercoat: Clear varnish made for use on interior stained-finished woodwork (FS TT-V-86):
   a. Devoe: 4600 Wonder Wood Satin Alkyd Satin Varnish.
   b. Moore: Benwood Satin Finish Varnish 404.
   c. S-W: Oil Base Varnish, A66V91/A66F90.
5. Finish Coat: Clear varnish made for use on interior stained-finished woodwork (FS TT-V-86):
   a. Devoe: 4600 Wonder Wood Satin Alkyd Satin Varnish.
   b. Moore: Benwood Satin Finish Varnish 404.
   c. S-W: Oil Base Varnish, A66V91/A66F90.

N. Woodwork, Painted - Alkyd, Semigloss: Two coats over primer.
1. Primer: Enamel undercoat made for use as a primer over wood under an odorless alkyd enamel:
   a. Con-Lux: Enamel Underbase 54 White.
   b. Devoe: 50501 Interior Alkyd Primer and Vapor Barrier
   c. Moore: Moore's Alkyd Enamel Underbody 217.
   d. S-W: Wall and Wood Primer B49WZ2.
2. Undercoat: Semigloss odorless alkyd enamel made for use over a primer on wood (FS TT-E-509):
   a. Con-Lux: Satin-Lite 900 Series.
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
   c. Moore: Moore's Satin Impervo Enamel 235.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.
3. Finish Coat: Semigloss odorless alkyd enamel made for use over a primer and undercoat on wood (FS TT-E-509):
   a. Con-Lux: Satin-Lite 900 Series.
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
   c. Moore: Moore's Satin Impervo Enamel 235.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.

O. Ferrous Metal - Silicone-Alkyd, Semigloss: Two coats over primer:
1. Primer: Lead and chromate-free high solids primer which chemically inhibits rusting and is recommended by the manufacturer for application to steel which has been prepared in accordance with SSPC SP2. Rated 10 (less than 0.01% surface rusting) when tested in accordance with ASTM B117 for 500 hours. Exceeds performance requirements of FS TT-P-636:
   a. Con-Lux: Rust Arrestor 50.
   b. S-W: Kem Kromik Universal Metal Primer B50NZ6.
   c. Tnemec: Series P10.
2. Undercoat: Alkyd enamel recommended by manufacturer of finish coat as an intermediate coat over specified primer for application of silicone-alkyd finish coat:
   a. Con-Lux: Ferrox Primer.
   b. S-W: Silicone Alkyd Enamel B-56 Series.
   c. Tnemec: Series 23 Enduratone.
3. Finish Coat: Silicone-alkyd enamel with a minimum of 30% silicone content meeting the qualitative requirements of FS TT-E-490:
   a. Con-Lux: Steel-Master 9500 Series.
   b. S-W: Silicone Alkyd Enamel B-56 Series.
   c. Tnemec: Series 82 Silicone-Alkyd Enamel.

P. Ferrous Metal - Alkyd, Semigloss: Two coats over primer with total dry film thickness not less than 2.5 mils.
1. Primer: Quick-drying, rust-inhibiting primer made for priming ferrous metal under an odorless alkyd enamel (FS TT-P-664):
   a. Con-Lux: Ferrox Primer.

b. Devoe: 41820 Bar-Ox Alkyd Shop/Field Primer.
c. Moore: Ironclad Retardo Rust-Inhibitive Paint 163
d. S-W: Kem Kromik Metal Primer B50N2/B50W1.

2. Undercoat: Enamel undercoat made for use as an undercoat over a primer on ferrous metal under an odorless alkyd enamel:
   a. Con-Lux: Satin-Lite 900 Series.
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
   c. Moore: Moore's Alkyd Enamel Underbody 217.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.
3. Finish Coat: Semigloss odorless alkyd enamel made for use over a primer and undercoat on ferrous metal surfaces (FS TT-E-509):
   a. Con-Lux: Satin-Lite 900 Series.
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel
   c. Moore: Moore's Satin Impervo Enamel 235.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.

Q. Ferrous Metal - Epoxy, Gloss: Two coats over primer:
1. Primer: Corrosion-inhibitive primer recommended by manufacturer for priming ferrous metal under an epoxy undercoat:
   a. Con-Lux: Epolon Mastic 36 White.
   b. Duron: Dura Clad Universal Phenolic Alkyd Fast Dry Metal Primer.
   c. Moore: IronClad Epoxy Rust Inhibitive Primer
   d. S-W: Recoatable Epoxy Primer.
2. Undercoat: Epoxy undercoat made for use as an undercoat over a primer on metal under a gloss epoxy enamel:
   a. Con-Lux: Epolon Series.
   b. Duron: Dura Clad Polyamide Epoxy.
   c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
   d. S-W: ArmorSeal 100HS Series.
3. Finish Coat:
   a. Gloss epoxy enamel made for use over a primer and epoxy undercoat on metal surfaces.
      1) When the finish coat is applied to a floor surface, add anti-slip aggregate.
   b. Con-Lux: Epolon Series.
   c. Duron: Dura Clad Polyamide Epoxy.
   d. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
   e. S-W: ArmorSeal 100HS Series.

~~R. Zinc-coated Metal - Alkyd, Semigloss: Two coats over primer, with total dry film thickness not less than 2.5 mils.~~
~~1. Primer: Galvanized metal primer made for use on zinc-coated (galvanized) metal surfaces (FS TT-P-641), or one of the following:~~
   ~~a. Con-Lux: Bond-Plex 46 Barrier Green.~~
   ~~b. Devoe: 13201 Mirrolac Galvanized Metal Primer.~~
   ~~c. Moore: Ironclad Galvanized Metal Latex Primer 155.~~
   ~~d. S-W: Industrial Water Based Acrylic Paint B42W110.~~
~~2. Undercoat: Enamel undercoat made for use as an undercoat over a primer on zinc-coated metal under an odorless alkyd enamel:~~
   ~~a. Con-Lux: Satin-Lite 900 Series.~~
   ~~b. Devoe: 26XX Velour Alkyd Semigloss Enamel.~~
   ~~c. Moore: Moore's Alkyd Enamel Underbody 217.~~
   ~~d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.~~
~~3. Finish Coat: Semigloss odorless alkyd enamel made for use over a primer and undercoat on zinc-coated (galvanized) metal surfaces (FS TT-E-509):~~
   ~~a. Con-Lux: Satin-Lite 900 Series.~~

b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
c. Moore: Moore's Satin Impervo Enamel 235.
d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.

S. Zinc-Coated Metal - Silicone-Alkyd, Semigloss: Two coats over factory-applied primer:
1. Primer: Galvanized metal primer used to prime zinc-coated (galvanized) metal surfaces (FS TT-P-641), or one of the following.
a. Con-Lux: Bond-Plex 46 Barrier Green.
b. Devoe: 13201 Mirrolac Galvanized Metal Primer.
c. Moore: Ironclad Galvanized Metal Latex Primer #155.
d. S-W: Industrial Water Based Acrylic Paint B42W110.
2. Undercoat: Alkyd enamel recommended by manufacturer of finish coat as an intermediate coat over factory-applied primer for application of silicone-alkyd finish coat:
a. Con-Lux: Ferrox Primer.
b. S-W: Silicone Alkyd Enamel B-56 Series.
c. Tnemec: Series 23 Enduratone.
3. Finish Coat: Silicone-alkyd enamel with a minimum of 30% silicone content meeting the qualitative requirements of FS TT-E-490:
a. Con-Lux: Steel-Master 9500 Series.
b. S-W: Silicone Alkyd Enamel B-56 Series.
c. Tnemec: Series 82 Silicone-Alkyd Enamel.

T. Zinc-Coated Metal - Epoxy, Gloss: Two coats over primer:
1. Primer: Primer recommended by manufacturer for priming galvanized metal under an epoxy undercoat:
a. Con-Lux: Metal Bond 47 Primer.
b. Duron:
1) Vinyl Wash Primer for surfaces subject to abrasion;
2) Dura Clad Acrylic Galvanized Metal Primer for surfaces not subject to abrasion.
c. Moore: IronClad Galvanized Metal latex Primer.
d. S-W: ArmorSeal 100HS Series.
2. Undercoat: Epoxy undercoat made for use as an undercoat over a primer on metal under a gloss epoxy enamel:
a. Con-Lux: Epolon Series.
b. Duron: Dura Clad Polyamide Epoxy.
c. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
d. S-W: ArmorSeal 100HS Series.
3. Finish Coat;
a. Gloss epoxy enamel made for use over a primer and epoxy undercoat on metal surfaces.
1) When the finish coat is applied to a floor surface, add anti-slip aggregate.
b. Con-Lux: Epolon Series.
c. Duron: Dura Clad Polyamide Epoxy.
d. Moore: IronClad Chemical and Water Resistant Epoxy Enamel.
e. S-W: ArmorSeal 100HS Series.

U. Non-Ferrous Metal - Alkyd, Semigloss: Two coats over primer with total dry film thickness not less than 2.5 mils.
1. Primer: Corrosion inhibitive primer recommended by manufacturer for priming non-ferrous metal under an odorless alkyd enamel:
a. Con-Lux: Bond-Plex 46 Barrier Green.
b. Devoe: 13201 Mirrolac Galvanized Metal Primer.
c. Moore: Ironclad Retardo Rust-Inhibitive Paint 163.

d. S-W: Kem Kromik Metal Primer B50N2/B50W1.

2. Undercoat: Enamel undercoat made for use as an undercoat over a primer on non-ferrous metal under an odorless alkyd enamel:
   a. Con-Lux: Satin-Lite 900 Series.
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
   c. Moore: Moore's Alkyd Enamel Underbody 217.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100 Series.
3. Finish Coat: Semigloss odorless alkyd enamel made for use over a primer and undercoat on non-ferrous metal surfaces (FS TT-E-509):
   a. Con-Lux: Satin-Lite 900 Series.
   b. Devoe: 26XX Velour Alkyd Semigloss Enamel.
   c. Moore: Moore's Satin Impervo Enamel 235.
   d. S-W: Pro-Mar Alkyd Semi-Gloss Enamel B34WZ1100

V. Cotton or Canvas Covering over Insulation - Latex, Flat: 2 coats.
1. Undercoat: Flat latex-based paint with fungicidal agent added (to render fabric mildew-proof) made for use as a sealing coat (size) on cotton or canvas covering over insulation:
   a. Con-Lux: Wall-Plex 400 Series.
   b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
   c. Moore: Regal Wall Satin 215.
   d. S-W: Pro-Mar 200 Latex Flat Wall Paint B30W200 Series.
2. Finish Coat: Flat latex-based paint with fungicidal agent added (to render fabric mildew-proof) made for use as a sealing coat (size) on cotton or canvas covering over insulation:
   a. Con-Lux: Wall-Plex 400 Series.
   b. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
   c. Moore: Regal Wall Satin 215.
   d. S-W: Pro-Mar 200 Latex Flat Wall Paint B30W200 Series.

PART 3 - EXECUTION

3.01 PREPARATORY WORK:

A. Inspect surfaces for their suitability to receive a finish. In the event that imperfections due to materials or workmanship appear on surfaces, make the appropriate corrections at no additional cost to the Authority. Correct damage to painted or decorated finishes due to carelessness or negligence of other trades.

B. Protect hardware, hardware accessories, plates, lighting fixtures and similar items installed prior to painting; remove protection upon completion of each space. Where necessary to remove installed products to ensure their protection, arrange for removal and reinstallation by mechanics of the trade involved. Disconnect equipment adjacent to walls; where necessary, move to permit painting of wall surfaces, and following completion of painting, replace and reconnect.

C. Clean surfaces to be painted as necessary to remove dust and dirt. Sand as necessary to properly prepare surfaces to receive paint or varnish.

D. Wash metal surfaces with benzine or mineral spirits to remove dirt, oil or grease before applying paint. Where rust or scale is present, wire brush or sandpaper clean before painting. ~~Apply galvanized metal primer to degreased galvanized metal before applying additional coats.~~

E. Prepare masonry surfaces to be painted by removing dirt, dust, oil and grease stains and efflorescence. The method of surface preparation is at the discretion of the Contractor provided that the results are approved. Clean masonry and plaster surfaces to be painted until they are free from alkali and thoroughly dry before applying paint. Test masonry and plaster surfaces for alkali, using red litmus paper, prior to painting.

F. Clean concrete surfaces free from dirt, or film left from form oil or concrete curing compounds, or loose or excess mortar. Steam clean or wash the surfaces with water. Use cleaning additive with discretion, in accordance with paint manufacturer's recommendation and to the satisfaction of Engineer.

G. Cut out cracks, scratches and other imperfections in plaster surfaces as required, fill with spackling compound and sand flush with adjacent surface. Fill voids in concrete with cement grout before painting.

H. Fill nail holes and cracks after first coat with non-shrinking putty of a color to match that of the finish.

I. Sand, dust and touch up scratches, abrasions or other disfigurements and remove foreign matter from prime coats before proceeding with the following coat. Featheredge spotpriming or spot coating into adjacent coatings to produce a smooth and level surface.

J. Test concrete and plaster surfaces for moisture, using moisture meter, prior to painting. Do not apply paint to surfaces having meter reading above 15.

K. Caulk joints between door and window frames and walls, and other joints as necessary.

L. Coordinate the work of this section with the work of other trades.

3.02 APPLICATION:

A. Touch-up painting of structural steel, miscellaneous metal, hollow-metal doors and frames, and other materials which have been prime coated as may be required where the shop coat has been damaged by welding or abrasion during the handling and erection operations; also rivets, bolts and welds which are unpainted after assembly and erection.

B. Apply paint by spray in accordance with the manufacturer's directions to achieve required dry film thickness (DFT). Where specifically approved by the Engineer, use rollers or brushes as best suited for material being applied. For covers on rollers use carpet with velvet back and high-pile sheep's wool or use short-hair covers, as best suited for material and texture specified. Except where otherwise noted, apply paint to a minimum dry-film thickness (DFT) of five mils, excluding filler coats, using no less than the number of coats specified in Part 2 – Products.

C. Apply material evenly and smoothly without runs, sags or other defects with edges of paint adjoining other materials or color sharp and clean, without overlapping.

D. Do not paint and finish while surfaces are damp. Allow sufficient time between coats, in accordance with manufacturer's directions to produce an evenly smooth finish.

E. Do not apply final coats until after other trades, whose operations would be detrimental to finish painting, have finished their work in the areas to be painted and the areas have been approved for painting.

3.03 PROTECTION:

A. Dispose of soiled cleaning rags and waste at the close of each day's work or store such soiled rags and waste in metal containers with tight-fitting covers. Provide buckets of sand during painting operations for use in the event of fire. Post NO SMOKING signs as necessary and as directed.

B. Protect the work of other trades against damage or injury by use of suitable covering during the progress of the painting and finishing work. Repair damage to the satisfaction of the Engineer.

3.04 CLEANING:

A. Upon completion of work, remove staging, scaffolding and containers from the site. Remove paint spots, oil or stains from glass, floors and other surfaces not to be painted, and leave job clean and acceptable to the Engineer.

3.05 COLOR CODING OF PIPING AND EQUIPMENT:

A. General Requirements:
1. Color coding is required for accessible piping systems and related equipment, except associated supports, brackets, hangers and similar accessories.
2. Identify piping systems and related equipment which are to be color coded as follows:
   a. Apply color to entire length of piping.
   b. Apply lettered legends indicating the name of the contents of the system as specified.

B. Location of Legends and Bands:
1. Stencil lettered legends on the piping at the horizontal or vertical centerline. Where pipe lines are too close together and where located above the operator's normal line of vision, place the lettering below the horizontal centerline at a point which will be easily visible.
2. Locate lettered legends and bands at points where pipes enter and leave rooms or spaces, at junction points and points of distribution, close to valves and equipment, at changes in direction, and at intervals along piping where necessary for identification.
3. Stencil piping in accordance with ASME A13.1 and as follows to show service and direction of flow, space within sight of each other and not more than 40 feet apart on long runs.

C. Size of Stencil Letters for Piping Identification:

Outside Diameter of Pipe Covering in Inches	Size of Letter in Inches	Width of Color Band in Inches
3/4 to 1-1/4	1/2	4
1-1/2 to 2-1/2	3/4	6
3 to 6	1-1/4	8
7 to 10	2-1/2	12
Over 10	3-1/2	12

D. Schedule of Colors and Legends:

Line	Pipe Color	Black Stenciled Legend
Hot water lines	Yellow	HW, HWR
Potable cold water lines	Blue	CW
Chilled water lines	Blue with yellow band	CHWS, CHWR
Fire lines	Red	F (use White Stencil instead of black)
Condensate lines	White	C
Condenser water lines	White with blue band	CWS, CWR
Soil and waste lines	White	S
Vent lines	Grey with white band	V
Storm Water lines	White	ST-W
Air and control air lines	Green	A

END OF SECTION

A. Deliver products to Project site in manufacturer's original, unopened cartons and containers, clearly labeled with manufacturer's name and brand designation, referenced specification number, type and color, 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.

D. Handle products to prevent breakage of containers and damage to products.

E. Move products into spaces where they will be installed at least 48 hours before installation, unless longer conditioning period is recommended in writing by manufacturer.

1.05 PROJECT CONDITIONS:

A. Maintain a temperature of not less than 70 deg F or more than 90 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 post-installation 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

C. Do not install base until plaster or other backing material has thoroughly dried.

D. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by manufacturer.

E. Install tiles and accessories after other finishing operations, including painting, have been completed. Where demountable partitions and other items are indicated for installation on top of resilient tile flooring, install tile before these items are installed.

F. 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.

1.06 EXTRA MATERIALS:

A. Furnish and store where directed 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 percent of the total quantity of each type, color, pattern, class, wearing surface, and size of resilient tile flooring installed, but not less than one full unopened container.
   2. Furnish not less than one percent of the total quantity of each type, color, and size of base material installed, but not less than one full unopened container.

PART 2 - PRODUCTS

2.01 RESILIENT FLOORING:

A. Rubber Floor Covering: Products complying with ASTM F1344 and with requirements specified.
   1. Manufacturers: including but not limited to:

a. R.C.A. Rubber Company.
b. Or equal.

2. Color and Pattern: Terra Cotta.
3. Class: I-A.
4. Hardness: Durometer hardness not less than 85 Shore, Type A per ASTM D2240 as required according to ASTM F1344.
5. Wearing Surface: Textured.
6. Thickness: 3/16 inch.
7. Fabrication: Fabricate heavy duty rubber mat with interlocking joints in five pieces to fit area shown, with edges square and true, without overlap.

B. Vinyl Composition Floor Tile: Products complying with ASTM F1066 and with requirements specified:

1. Manufacturers: including but not limited to
   a. Armstrong.
   b. Azrock.
   c. GAF.
   d. Kentile.
   e. Or equal.
2. Color and Pattern: As selected by the Engineer 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 unless otherwise indicated.
5. Thickness: 1/8 inch.
6. Size: 12 by 12 inches.

2.02 RESILIENT ACCESSORIES:

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

1. Color and Pattern: As selected by the Engineer from manufacturer's full range of colors and patterns produced for vinyl wall base complying with requirements indicated
2. Style: Cove with top-set toe unless otherwise indicated.
3. Minimum Thickness: 1/8 inch.
4. Height: 4 inches.
5. Lengths: Cut lengths longest practicable or coils in lengths standard with manufacturer, but not less than 96 feet.
6. Outside Corners: Job formed.
7. Inside Corners: Job formed.
8. Surface: Smooth.

B. Rubber Stair Treads: Products of style suitable for use indicated and complying with FS RR-T-650, Composition A and with requirements specified:

1. Manufacturers: including but not limited to:
   a. R.C.A. Rubber Company.
   b. Or equal.
2. Color and Pattern: Terra Cotta.
3. Design: Type 1 (smooth).
4. Abrasive Strips: Provide abrasive strips as specified by the product designation indicated above in color selected by the Engineer from manufacturer’s full range of colors.
5. Nosing Style: Round.
6. Nosing Height: ½ inch light color.
7. Thickness: 5/16-inch tapering to 3/16-inch at back edge.

8. Size: Lengths and depths to fit each stair tread in one piece.
9. Fabrication: Fabricate nosing of stair tread to wrap around curved ends of step, to provide a uniform elevation appearance on three sides of step. Abrade at least 80 percent of the back of tread and nosing to assure adhesion to substrate. Fabricate nosing so that it will not delaminate or otherwise separate from the stair tread material.

2.03 INSTALLATION ACCESSORIES:

A. Tile Reducer Edge Strip: Products complying with FS SS-T-312, beveled, one-inch wide, 1/8-inch thick. Color to match vinyl wall base.

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

C. Tile Adhesive: Waterproof asphalt cut-back cement recommended by manufacturer to suit resilient products and substrate conditions indicated.

D. Stair Tread Adhesive: Permanent, as recommended by tread manufacturer for adhesion to galvanized steel substrate.

E. Stair Tread Nose Filler: Two-part epoxy compound recommended by tread manufacturer to fill nosing substrates that do not conform to tread contours.

F. Primer: As recommended by adhesive manufacturer.

G. Base Cement: Water-resistant, type recommended by manufacturer of vinyl wall base.

H. Building Paper: FS UU-B-790.

PART 3 - EXECUTION

3.01 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 Sub-floors: Verify that concrete slabs comply with ASTM F710 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.

C. Kiosk Equipment: Verify configuration of equipment in kiosk to ensure fit of flooring within 1/16-inch tolerance.

3.02 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.

3.03 RESILIENT FLOORING INSTALLATION:

A. General: Comply with flooring manufacturer's written installation instructions.

B. Leveling Floor: Level floor by grinding high spots and filling low spots with leveling and patching compound following manufacturer's recommendations to ensure plane surface free of imperfections.

C. 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.

D. Uniformity of Color: Use tiles alternately from at least two cartons so that pattern will be uniform and not spotty due to variation that may be found in different cartons. 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.

E. Application of Primer: Unless adhesive manufacturer recommends against priming, apply primer at rate and by method recommended.

F. Application of Adhesive: 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.

G. Laying of Tile:
   1. 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.
   2. Extend tiles into toe spaces, door reveals, closets, and similar openings.
   3. Provide joints cut straight and true. Seal tile joints at pipes with waterproof cement.
   4. Embed tiles level, flush with surface and with tightly butted joints against adjoining tiles.
   5. Hand roll tiles according to tile manufacturer's written instructions.

H. 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.

3.04 RESILIENT ACCESSORY INSTALLATION:

A. General: Install resilient accessories according to manufacturer's written installation instructions.

B. Vinyl Wall Base: 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. Extend wall base into closets and offsets adjoining areas to receive wall base.
   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. Form outside corners on job 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.
   6. Form inside corners on job, from straight pieces of maximum lengths possible, by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

C. Rubber Stair Tread: Adhere nosing so that it will not delaminate or otherwise separate from the stair tread material.

D. Tile Reducer Edge Strip: Install edge strips at edges of flooring that would otherwise be exposed.
   1. Where tile stops at doorways without saddles or thresholds, set edge strips directly under doors.

E. Place resilient accessories so they are butted to adjacent materials and bond to substrates with adhesive.

3.05 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.

B. After flooring is laid and adhesive thoroughly cured, clean and finish resilient floors as recommended by the resilient product manufacturer with approved compatible products.

C. Keep traffic off finished floors during the reminder of construction period.

D. 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 reinforced kraft building paper and tape joints. Maintain such cover and otherwise protect floor until final acceptance.
   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.

3.06 MAINTENANCE MATERIALS:

A. After completion of the work, furnish and store where directed at least one percent of the total quantity of tile and one percent of base material, but not less than one full unopened container of each, for future maintenance.

B. Include proportional quantities of each type and color in original containers clearly marked to show contents and area of placement of each type and color.

END OF SECTION

A. Deliver products to Project site in manufacturer's original, unopened cartons and containers, clearly labeled with manufacturer's name and brand designation, referenced specification number, type and color, 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.

D. Handle products to prevent breakage of containers and damage to products.

E. Move products into spaces where they will be installed at least 48 hours before installation, unless longer conditioning period is recommended in writing by manufacturer.

1.05 PROJECT CONDITIONS:

A. Maintain a temperature of not less than 70 deg F or more than 90 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 post-installation 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

C. Do not install base until plaster or other backing material has thoroughly dried.

D. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by manufacturer.

E. Install tiles and accessories after other finishing operations, including painting, have been completed. Where demountable partitions and other items are indicated for installation on top of resilient tile flooring, install tile before these items are installed.

F. 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.

1.06 EXTRA MATERIALS:

A. Furnish and store where directed 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 percent of the total quantity of each type, color, pattern, class, wearing surface, and size of resilient tile flooring installed, but not less than one full unopened container.
   2. Furnish not less than one percent of the total quantity of each type, color, and size of base material installed, but not less than one full unopened container.

PART 2 - PRODUCTS

2.01 RESILIENT FLOORING:

A. Rubber Floor Covering: Products complying with ASTM F1344 and with requirements specified.
   1. Manufacturers: including but not limited to:

a. R.C.A. Rubber Company.
b. Or equal.

2. Color and Pattern: Terra Cotta.
3. Class: I-A.
4. Hardness: Durometer hardness not less than 85 Shore, Type A per ASTM D2240 as required according to ASTM F1344.
5. Wearing Surface: Textured.
6. Thickness: 3/16 inch.
7. Fabrication: Fabricate heavy duty rubber mat with interlocking joints in five pieces to fit area shown, with edges square and true, without overlap.

B. Vinyl Composition Floor Tile: Products complying with ASTM F1066 and with requirements specified:

1. Manufacturers: including but not limited to
   a. Armstrong.
   b. Azrock.
   c. GAF.
   d. Kentile.
   e. Or equal.
2. Color and Pattern: As selected by the Engineer 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 unless otherwise indicated.
5. Thickness: 1/8 inch.
6. Size: 12 by 12 inches.

2.02 RESILIENT ACCESSORIES:

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

1. Color and Pattern: As selected by the Engineer from manufacturer's full range of colors and patterns produced for vinyl wall base complying with requirements indicated
2. Style: Cove with top-set toe unless otherwise indicated.
3. Minimum Thickness: 1/8 inch.
4. Height: 4 inches.
5. Lengths: Cut lengths longest practicable or coils in lengths standard with manufacturer, but not less than 96 feet.
6. Outside Corners: Job formed.
7. Inside Corners: Job formed.
8. Surface: Smooth.

B. Rubber Stair Treads: Products of style suitable for use indicated and complying with FS RR-T-650, Composition A and with requirements specified:

1. Manufacturers: including but not limited to:
   a. R.C.A. Rubber Company.
   b. Or equal.
2. Color and Pattern: Terra Cotta.
3. Design: Type 1 (smooth).
4. Abrasive Strips: Provide abrasive strips as specified by the product designation indicated above in color selected by the Engineer from manufacturer’s full range of colors.
5. Nosing Style: Round.
6. Nosing Height: ½ inch light color.
7. Thickness: 5/16-inch tapering to 3/16-inch at back edge.

8. Size: Lengths and depths to fit each stair tread in one piece.
9. Fabrication: Fabricate nosing of stair tread to wrap around curved ends of step, to provide a uniform elevation appearance on three sides of step. Abrade at least 80 percent of the back of tread and nosing to assure adhesion to substrate. Fabricate nosing so that it will not delaminate or otherwise separate from the stair tread material.

2.03 INSTALLATION ACCESSORIES:

A. Tile Reducer Edge Strip: Products complying with FS SS-T-312, beveled, one-inch wide, 1/8-inch thick. Color to match vinyl wall base.

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

C. Tile Adhesive: Waterproof asphalt cut-back cement recommended by manufacturer to suit resilient products and substrate conditions indicated.

D. Stair Tread Adhesive: Permanent, as recommended by tread manufacturer for adhesion to galvanized steel substrate.

E. Stair Tread Nose Filler: Two-part epoxy compound recommended by tread manufacturer to fill nosing substrates that do not conform to tread contours.

F. Primer: As recommended by adhesive manufacturer.

G. Base Cement: Water-resistant, type recommended by manufacturer of vinyl wall base.

H. Building Paper: FS UU-B-790.

PART 3 - EXECUTION

3.01 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 Sub-floors: Verify that concrete slabs comply with ASTM F710 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.

C. Kiosk Equipment: Verify configuration of equipment in kiosk to ensure fit of flooring within 1/16-inch tolerance.

3.02 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.

3.03 RESILIENT FLOORING INSTALLATION:

A. General: Comply with flooring manufacturer's written installation instructions.

B. Leveling Floor: Level floor by grinding high spots and filling low spots with leveling and patching compound following manufacturer's recommendations to ensure plane surface free of imperfections.

C. 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.

D. Uniformity of Color: Use tiles alternately from at least two cartons so that pattern will be uniform and not spotty due to variation that may be found in different cartons. 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.

E. Application of Primer: Unless adhesive manufacturer recommends against priming, apply primer at rate and by method recommended.

F. Application of Adhesive: 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.

G. Laying of Tile:
   1. 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.
   2. Extend tiles into toe spaces, door reveals, closets, and similar openings.
   3. Provide joints cut straight and true. Seal tile joints at pipes with waterproof cement.
   4. Embed tiles level, flush with surface and with tightly butted joints against adjoining tiles.
   5. Hand roll tiles according to tile manufacturer's written instructions.

H. 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.

3.04 RESILIENT ACCESSORY INSTALLATION:

A. General: Install resilient accessories according to manufacturer's written installation instructions.

B. Vinyl Wall Base: 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. Extend wall base into closets and offsets adjoining areas to receive wall base.
   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. Form outside corners on job 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.
   6. Form inside corners on job, from straight pieces of maximum lengths possible, by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

C. Rubber Stair Tread: Adhere nosing so that it will not delaminate or otherwise separate from the stair tread material.

D. Tile Reducer Edge Strip: Install edge strips at edges of flooring that would otherwise be exposed.
   1. Where tile stops at doorways without saddles or thresholds, set edge strips directly under doors.

E. Place resilient accessories so they are butted to adjacent materials and bond to substrates with adhesive.

3.05 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.

B. After flooring is laid and adhesive thoroughly cured, clean and finish resilient floors as recommended by the resilient product manufacturer with approved compatible products.

C. Keep traffic off finished floors during the reminder of construction period.

D. 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 reinforced kraft building paper and tape joints. Maintain such cover and otherwise protect floor until final acceptance.
   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.

3.06 MAINTENANCE MATERIALS:

A. After completion of the work, furnish and store where directed at least one percent of the total quantity of tile and one percent of base material, but not less than one full unopened container of each, for future maintenance.

B. Include proportional quantities of each type and color in original containers clearly marked to show contents and area of placement of each type and color.

END OF SECTION

2. ASTM: A635, A641, B633, C635, CC636, 834, E84, E90, E488, E795, E1190, E1264.
3. CISCA: Ceiling Systems Handbook.
4. NAAMM: Metal Finishes Manual for Architectural and Metal Products.

B. 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.

C. 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.

D. 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.

E. 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 E1264 for Class A materials as determined by testing identical products per ASTM E84.
3. Products are identified with appropriate markings of applicable testing and inspecting agency.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Deliver acoustical panels and suspension system components to Project site in original, unopened packages, clearly labeled with the manufacturer's name, brand designation, specification number, type, class and ratings as applicable.

B. Store acoustical panels and suspensions system components in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

C. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

D. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.06 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, and work above ceilings is complete. Maintain temperature of 70 deg F minimum and relative humidity of 55-percent maximum in spaces in which acoustical panel work is being done.

1.07 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.

1.08 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 equal to 5.0 percent of amount installed.
   2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS:

2.01 ACOUSTICAL PANELS, GENERAL:

A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E1264 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 E795.

2.02 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 C635 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.

C. Attachment Devices: Size for five times design load indicated in ASTM C635, Table 1, Direct Hung, unless otherwise indicated.
   1. Cast-in-Place and Post-installed Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E488, conducted by a qualified testing and inspecting agency.
      a. Type: Cast-in-place anchors.
      b. Type: Post-installed expansion anchors.
      c. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B633, Class Fe/Zn 5 (0.005 mm) for Class SC service condition (mild).
   2. Post-installed Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E1190, conducted by a qualified testing and inspecting agency.

D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
   1. Zinc-Coated Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
   2. Size: Select wire diameter so its stress at five times hanger design load (ASTM C635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 12 gauge.

E. Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material and finish as that used for exposed flanges of suspension system runners. Provide moldings with exposed flange of the same width as exposed runner.

F. Metal Finish: Baked-Enamel Finish. Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat, with not less than 1.0-mil dry film thickness for topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2.0 mils.
   1. Color and Gloss: Matte white or as selected by the Engineer from manufacturer's full range of colors and glosses.

2.03 ACOUSTICAL SEALANT:

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C834 and the following requirements:
   1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

PART 3 - EXECUTION

3.01 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.

3.02 PREPARATION:

A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.
   1. If indicated, furnish cast-in-place anchors and similar devices to other trades for installation well in advance of time needed for coordinating other work.

B. 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.

3.03 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 C636.

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 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 support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, powder-actuated fasteners, or drilled-in anchors that extend through forms into concrete.
6. Do not attach hangers to steel deck tabs.
7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
8. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 6 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. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. 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 inside and outside corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

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 authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated or required.

3.04 FIELD QUALITY CONTROL OF POWER-ACTUATED FASTENERS AND POST-INSTALLED ANCHORS:

A. Testing Agency: Contractor will engage a qualified independent testing agency to perform field quality-control testing.

B. Extent and Testing Frequency: Testing will take place in successive stages in areas described below. Proceed with installation of acoustical panel ceilings only after test results for previously installed hangers comply with requirements.
1. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed.

2. Within each test area, testing agency will select one of every 10 powder-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test them for 200 lbf of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf of tension.
3. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 consecutively pass and then will resume initial testing frequency.

C. Testing agency will report test results promptly and in writing to Contractor and Engineer.

D. Remove and replace those fasteners and anchors that test results indicate do not comply with specified requirements

E. Additional Testing: Where fasteners and anchors are removed and replaced, additional testing will be performed to determine compliance with specified requirements.

3.05 CLEANING:

A. Replace damaged and broken acoustical panels.

B. 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.

C. Clean up rubbish and debris and remove from site.

D. Leave work areas in a broom clean condition.

END OF SECTION