SECTION 093000 - TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Ceramic tile.
2. Tile backing panels.
3. Waterproof membrane.
4. Metal edge strips.

B. Related Sections:
1. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.

1.2 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

C. Samples for Verification:
1. Full-size units of each type and composition of tile and for each color and finish required.
2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 12 inches square, but not fewer than four tiles. Use grout of type and in color or colors approved for completed Work.
3. Full-size units of each type of trim and accessory for each color and finish required.
4. Thresholds in 6-inch lengths.
5. Metal edge strips in 6-inch lengths.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports:
1. Slip-resistance test reports from qualified independent testing agency.

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1.5 QUALITY ASSURANCE

A. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.7 WARRANTY

A. Special Waterproofing Warranty: Manufacturer agrees to replace waterproofing that does not comply with material requirements within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers for Setting and Grouting Materials:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. ARDEX Americas.
      b. Custom Building Products.
      c. H.B. Fuller Construction Products Inc. / TEC.
      d. Laticrete International, Inc.
      e. MAPEI Corporation.
      f. Parex USA, Inc.

B. Source Limitations for Setting and Grouting Materials: Obtain setting and grouting materials from single manufacturer and aggregate from single source or producer.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:
   1. Thresholds.
   2. Waterproof membrane.
   3. Crack isolation membrane.
   4. Backer units.
   5. Metal edge strips.

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2.2 PERFORMANCE REQUIREMENTS

A. Slip Resistance, Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products in accordance with the following:
   1. Level Surfaces, Dry and Wet: DCOF of not less than 0.42 in accordance with ANSI A326.3.

2.3 CERAMIC TILE PRODUCTS

A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

2.4 TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Board: ASTM C1178/C1178M, with manufacturer's standard edges.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. CertainTeed Corporation; GlasRoc Tile Backer.
      b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.
      c. National Gypsum Company; eXP Tile Backer.
      d. USG Corporation; Durock Glass-Mat Tile Backerboard.
   2. Core: 5/8 inch, Type X.
   3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.5 WATERPROOF MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.10 and ANSI A118.12 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Fabric-Reinforced, Modified-Bituminous Sheet: Self-adhering, SBS-modified-bituminous sheet with fabric reinforcement facing; 0.040-inch nominal thickness.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. National Applied Construction Products, Inc.; Strataflex.
      b. Protecto Wrap; AFM-WM.

2.6 SETTING MATERIALS

A. Modified Dry-Set Mortar (Thinset): ANSI A118.4.
   1. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive at Project site.
   2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

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B. Improved Modified Dry-Set Mortar for Large and Heavy Tile (Medium-Bed): Comply with requirements in ANSI A118.15. Provide product that is approved by manufacturer for application thickness of 5/8 inch.
   1. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive at Project site.
   2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

C. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3.
   1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 and 212 deg F, respectively, and certified by manufacturer for intended use.

2.7 GROUT MATERIALS

A. Grout Colors: As indicated on Drawings.

B. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less.
   1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 and 212 deg F, respectively, and certified by manufacturer for intended use.

2.8 MISCELLANEOUS MATERIALS

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

B. Metal Edge Strips: Profile as indicated, height to match tile and setting-bed thickness, designed specifically for tiling applications.
   1. Basis-of-Design Products:
      a. Wall tile top edge: provide Schluter Systems; Jolly Trim.
      b. Wall tile to floor tile: provide Schluter Systems; DILEX-AHK.
   2. Exposed Finish: Stainless steel.

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

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PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
   2. Verify that concrete substrates for tile floors installed with dry-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
      a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
      b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
   3. 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.
   4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

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

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with dry-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION OF TILE BACKING PANEL

A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

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3.4 INSTALLATION OF WATERPROOF MEMBRANE

A. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

B. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.

3.5 TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
   1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
      a. Tile floors in wet areas.
      b. Tile floors consisting of tiles 8 by 8 inches or larger.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. 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.

D. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

E. Joint Widths: Unless otherwise indicated, install tile with joint widths as recommended by tile manufacturer.

F. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
   1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
   2. Locate expansion joints as recommended by tile and tile installation material manufacturers, but not less than the following:
      a. Interior Locations: 20-25 feet in each direction.

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b. Interior Locations at Above Ground Concrete Slabs: 8-12 feet in each direction.
c. Interior Locations Exposed to Direct Sunlight or Moisture: 8-12 feet in each direction.

G. Metal Edge Strips: Install at locations indicated.

H. Grout Sealer: Apply grout sealer to[**cementitious**] grout joints[**in tile floors**] according to sealer manufacturer's written instructions. As soon as sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.6 FIELD QUALITY CONTROL

A. Flood Testing: Flood test each waterproofed area for leaks, in accordance with ASTM D5957 and manufacturer's recommendations, after completing and protecting waterproofing but before overlaying construction is placed.
1. Flood each area for 24 hours.
2. Repair leaks, repeat flood tests, and make further repairs until waterproofing installation is watertight.

3.7 CLEANING AND PROTECTION

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all tile surfaces so they are free of foreign matter.
1. Remove grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

C. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

D. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

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

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3.8 INTERIOR TILE INSTALLATION SCHEDULE

A. Interior Floor Installations:
   1. Ceramic Tile Over Concrete:
      a. TCNA F122, 122A: On-ground and above-ground concrete; Waterproof membrane.
         1) Membrane: Waterproof membrane.
         2) Mortar: Improved modified dry-set mortar.
            a) Provide thinset mortar unless medium-bed mortar is recommended by tile or mortar manufacturer.
         3) Grout: Water-cleanable epoxy grout.

B. Interior Wall Installations:
   1. Ceramic Tile Over Wood or Metal Studs:
      a. TCNA W245: Wood or metal studs; Coated glass-mat, water-resistant gypsum backer board.
         1) Mortar: Modified dry-set mortar.
            a) Provide thinset mortar unless medium-bed mortar is recommended by tile or mortar manufacturer.
         2) Grout: Water-cleanable epoxy grout.

END OF SECTION 093000

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