

SECTION 09310

TILE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Ceramic mosaic tile.
 - 2. Paver tile (porcelain tile).
 - 3. Glazed wall tile.
 - 4. Waterproof membrane for tile installations.
 - 5. Crack-suppression membrane for thin-set tile installations on slabs-on-grade.
 - 6. Metal edge strips installed as part of tile installations.
- B. Related Sections include the following:
 - 1. Division 2 Section "Selective Demolition and Alterations" for removing existing finishes.
 - 2. Division 3 Section "Cast-in-Place Concrete" for monolithic slab finishes specified for tile substrates.
 - 3. Division 7 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.

1.03 SUBMITTALS

- A. General: Submit in accordance with Section 01300.
- B. Product Data: For each type of product indicated.
- C. 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.
- D. Samples: Submit samples of grout consisting of strips of actual products showing full range of colors available.

1.04 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain all tile of same type from one source or producer.
 - 1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. 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.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
 - 1. Waterproofing.
 - 2. Crack-suppression membrane.
 - 3. Metal edge strips.

- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.05 DELIVERY, STORAGE, AND HANDLING

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

1.06 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient and substrate temperatures and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.
 - 1. Maintain temperatures at 50 deg F (10 deg C) or more in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.
- B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.

1.07 EXTRA MATERIALS

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

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 - 1. Products: Subject to compliance with requirements, provide one of the products specified.

2.02 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. As indicated by manufacturer's designations on Drawings.
- D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

2.03 TILE PRODUCTS

- A. Unglazed Ceramic Mosaic Tile, CT-1: Factory-mounted flat tile as follows:
1. Composition: Porcelain.
 2. Surface: Smooth, without abrasive admixture.
 3. Module Size: **2 by 2 inches**.
 4. Nominal Thickness: **1/4 inch**.
 5. Face: Plain with cushion edges.
 6. Trim Units: Cove base trim with manufactured inside and outside corners.
 7. Product: Keystones; Daltile, Div. of DaTile International Inc.
 - a. Color: As indicated on Materials Legend.
- B. Unglazed Paver Tile (Porcelain Tile), PT-1, 2 & 3: Flat tile as follows:
1. Composition: Porcelain.
 2. Facial Dimensions: **12- by 12-inches**.
 3. Thickness: 5/16 inch.
 4. Face: Textured with cushion edges.
 5. Finish: Unpolished.
 6. Trim Units: Base trim with surface bullnose top edge.
 7. Product: Rocky Mountain; Daltile; Div. of DaTile International Inc.
 - a. Colors: As indicated on Materials Legend.
- C. Glazed Wall Tile, CT-2 & 3: Flat tile as follows:
1. Module Size: **4-1/4 by 4-1/4 inches**.
 2. Thickness: **5/16 inch**.
 3. Face: Plain with cushion edges.
 4. Finish: Bright, opaque glaze.
 5. Mounting: Factory back-mounted.
 6. Trim Units: Cove base, surface bullnose top edge, with manufactured inside and outside corners.
 7. Product: Semi-Gloss; Daltile; Div. of DaTile International Corp.
 - a. Colors: As indicated on Materials Legend.

2.04 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANES FOR TILE INSTALLATIONS

- A. General: Manufacturer's standard product that complies with ANSI A118.10.
- B. Waterproofing for Thick-Set Installations: Trowelable, elastomeric, urethane waterproofing membrane; flat troweled to 30 mil cured thickness.
1. Product: Bostik Findley; Hydroment Ultra-Set.
 2. Location: Shower stalls and Shower Rooms.
- C. Waterproofing for Thin-Set Installations: Fabric-reinforced, fluid-applied system consisting of liquid-latex rubber and fabric reinforcement.
1. Products:
 - a. LATICRETE International Inc.; Laticrete 9235 Waterproof Membrane.
 - b. MAPEI Corporation; PRP M19.
 2. Location: Over all elevated slabs receiving ceramic tile flooring.
- D. Crack-Suppression Membrane: Consisting of a two-part, liquid rubber and fabric reinforcement applied over entire floor with Laticrete latex thin-set mortar.
1. Product: LATICRETE International Inc.; Laticrete Blue 92 Anti-Fracture Membrane.
 2. Location: Use under porcelain paver tile.

2.05 SETTING AND GROUTING MATERIALS

- A. Manufacturers:
1. Bostik.

2. C-Cure.
3. LATICRETE International Inc.
4. MAPEI Corporation.
5. TEC Specialty Products Inc.

- B. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.1A and as specified below:
1. Portland Cement: ASTM C-150, Type 1.
 2. Hydrated Lime: ASTM C-206 or C-207, Type S.
 3. Sand: ASTM C-144, clean, washed, sharp, durable, uncoated aggregate free from all deleterious substances, uniformly graded from coarse to fine with 100 percent passing through a No. 4 mesh screen, and not more than 5 percent passing through a No. 100 mesh screen.
 4. Reinforcing Wire Fabric: Galvanized, welded wire fabric, 2 by 2 inches by 0.062-inch diameter, 16 gage, minimum, comply with ASTM A 185 and ASTM A 82 except for minimum wire size.
- C. Latex-Portland Cement Mortar (Thin Set) and Grout: ANSI A118.4, consisting of the following:
1. Prepackaged dry-mortar mix combined with acrylic resin liquid-latex additive.
 - a. For wall applications, provide nonsagging mortar that complies with Paragraph F-4.6.1 in addition to the other requirements in ANSI A118.4.
 2. Grout Colors: As selected by Architect.
- D. Organic Adhesive: Emulsion based adhesive conforming with ANSI A136.1, Type I.

2.06 ELASTOMERIC SEALANTS

- A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 7 Section "Joint Sealants."
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.

2.07 MISCELLANEOUS MATERIALS

- A. Trowe lable 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: Zinc alloy or stainless steel terrazzo strips, 1/8-inch wide at top edge with integral provision for anchorage to mortar bed or substrate unless otherwise indicated.
- C. Control Joints (CJ): Control joints for porcelain tile, thermoplastic movement joint with opposing metal profiles.
 1. Product: Schluter DILEX-KS.
- 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.

2.08 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions, including those for accurate proportioning of materials, water, or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality with optimum performance characteristics for application indicated.
- B. 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. Check flatness of substrate. Level floor to provide a base for thin set that allows for a smooth, flat floor without irregularities. Verify proper drainage to drains. Grinding high spots until substrate is acceptable to the flooring Installer is specified in Section 03300.
 - 2. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
 - 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 before installing tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Lay tile in patterns indicated. When field conditions conflict with indicated pattern, notify Architect in writing prior to installation for review and approval of revisions.

3.02 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile -setting materials.
- B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
 - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Preparation of Existing Substrates Receiving Tile: Lightly shot blast concrete floor surfaces to thin-set tile installation.
- D. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, 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.

3.03 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile. Top setting of coved base is not permitted.

- E. Tile shall lay flat and each edge flush with adjacent tile, free of tilting and skewed tile. Provide additional setting material to shim accent tiles that are thinner than field tiles so face is in same plane.
- F. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
- G. Lay out tile wainscots to next full tile beyond dimensions indicated.
- H. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete substrates. Locate expansion joints in accordance with approved Shop Drawings.
 - 2. Space joints no greater than 36 feet apart, 16 feet apart at areas exposed to direct sunlight.
 - 3. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."
- I. Grout tile to comply with requirements of the following tile installation standards:
 - 1. For ceramic tile grouts (latex-portland cement grouts), comply with ANSI A108.10.

3.04 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANE INSTALLATION

- A. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
 - 1. Turn membrane up walls as follows to keep water from traveling under partitions:
 - a. Toilet Rooms with Tile Floors on Elevated Slabs: 2 inches minimum at perimeter walls of rooms.
 - b. Shower Rooms: 4 inches minimum at perimeter walls of Shower Rooms.
- B. Install crack-suppression membrane to comply with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.
- C. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.05 FLOOR TILE INSTALLATION

- A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCA installation methods and ANSI A108 Series of tile installation standards.
 - 1. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.
 - a. Tile floors in wet areas.
 - b. Tile floors composed of tiles **8 by 8 inches** or larger.
- B. Joint Widths: Install tile on floors with the following joint widths:
 - 1. Ceramic Mosaic Tile: **1/16 inch**.
 - 2. Paver Tile (Porcelain Tile): **1/4 inch**.
- C. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

3.06 WALL TILE INSTALLATION

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

3.07 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove latex-portland cement grout residue from tile as soon as possible.
 - 2. 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.
- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. 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.

3.08 TILE INSTALLATION SCHEDULE

- A. Ceramic Tile over Concrete Floors on Grade, General Areas: Thin-set latex portland cement mortar, TCA F113.
- B. Ceramic Tile over Concrete Floors, Thick Set in Shower Areas: Reinforced cement mortar, waterproof membrane, TCA B414.
 - 1. Seal perimeter of shower room by running waterproof membrane up wall 4 inches minimum.
- C. Ceramic Tile over Concrete Floors with Occupied Rooms Below: Latex portland cement mortar, waterproof membrane, TCA F122.
 - 1. At toilets rooms, seal perimeter of room by running waterproof membrane up wall 2 inches minimum.
- D. Paver Tile (Porcelain Tile) Floor Tile over Concrete Floor: Thin-set latex portland cement mortar tile setting bed over anti-fracture membrane, TCA F113 modified.
 - 1. Anti-fracture membrane over all saw joints and random cracks only.
- E. Ceramic Wall Tile on CMU, Thin-Set: Latex portland cement mortar over leveling coat, TCA W202.
 - 1. Provide waterproof membrane on CMU shower walls only where wall is painted on opposite side.

END OF SECTION