

SECTION 09310

CERAMIC TILE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ceramic tile for floors and walls; latex-portland cement mortar, and epoxy grout; thin-set applications.
2. Ceramic Base
3. Mortar, grout, and accessories.
4. Cementitious backer units for application of tile.

B. Related Sections:

1. Section 07920 - Joint Sealants: Sealing of tile expansion joints and where tile abuts plumbing fixtures, countertops, and items penetrating tile walls, wainscots, etc.
2. Division 15: Plumbing fixtures and floor drains.

1.2 REFERENCES

A. Industry Standards: The Industry Standards listed below refer to the latest date of issue or editions, unless otherwise indicated.

1. ANSI A108 Series (A108.1A, .1B, .1C, .4, .5, .6, .8, .9, .10, .11, .12, and .13-1999): Specifications for Installation of Ceramic Tile
2. ANSI A118.3 Specifications for Chemical Resistant Water Cleanable Tile-Setting and Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive.
3. ANSI A118.4: Specifications for Latex-Portland Cement Mortar.
4. ANSI A118.6: Specifications for Standard Cement Grouts for Tile Installation.
5. ANSI A118.7: Specifications for Polymer Modified Cement Grouts for Tile Installation
6. ANSI A137.1 Specifications for Ceramic Tile.
7. ASTM C144 Aggregate for Masonry Mortar.
8. ASTM C150 Portland Cement.
9. TCA (Tile Council of America) Handbook for Ceramic Tile Installation.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation recommendations for each type of product proposed.

B. Shop Drawings: Indicate tile patterns and locations and widths of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

1. Locate precisely each joint and crack in tile substrates by measuring, record measurements on shop drawings, and coordinate them with tile joint locations, in consultation with Architect.
- C. **Samples for Initial Selection:** Actual tile samples of tile showing full range of colors, textures, and patterns available for each type and composition of tile indicated. Include samples of grout and accessories involving color selection.
- D. **Samples for Verification:** Sets showing full range of color and texture variations, in sets showing full range of variations expected.
 1. Each type and composition of tile and for each color and texture required, at least 12 inches square, mounted on plywood or hardboard backing and grouted.
 2. Full-size units of each type of trim and accessory for each color required.
 3. Stone thresholds in 6 inch lengths.

1.4 QUALITY ASSURANCE

- A. **Single-Source Responsibility for Tile:** For ceramic tiles to be used for bathrooms throughout the project select a single source, which matches color, grade, finish, type, composition and variety of tile such as Dal Tile as called out on the Finish Schedule. For tiles to be used for bathrooms throughout the project, a single source will also be required. Select a source which matches color, grade, finish, type, composition, and variety of tile such as Northstar Ceramics as called out on the Finish Schedule.
- B. **Single-Source Responsibility for Setting and Grouting Materials:** Obtain ingredients of a uniform quality from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate. Grouting materials shall include coloring agents to match grout to tiles for all fountains included in the project.
- C. **Installer Qualifications:** Engage an experienced Installer who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.
- D. **Regulatory Requirements:** All specifications for ceramic tile installations must conform to local building codes, ordinances, trade practices and climatic conditions.
- E. **Mock-up:** Submit mock-up of each ceramic tile with corresponding colored mortar and grout for approval before installation.
 1. Ceramic tile mock-ups shall be submitted on 24" x 24" plywood or cement board backing.
 2. Acceptance: When accepted, mock-up will demonstrate minimum standard for the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. **Delivery and Storage:** Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.

- B. **Protection:** Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

1.6 PROJECT CONDITIONS

- A. **Environmental Conditions:** Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. **Ventilation:** Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.
- C. **Temperature:** 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.

1.7 EXTRA MATERIALS

- A. **Deliver extra materials to Owner.** Furnish extra materials that match products installed as described below, packaged with protective covering for storage and identified with labels clearly 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Approved Products/Manufacturers:** Ceramic and porcelain tile products and manufacturers are listed in the "Interior Finish Legend" on the Drawings.
 - 1. **Unglazed Ceramic Mosaic Tile:** Factory-mounted flat tile as follows:
 - a. **Composition:** Porcelain.
 - b. **Surface:** Smooth, without abrasive admixture.
 - c. **Module Size:** 1 by 2 inches (25.4 by 50.8 mm).
 - d. **Nominal Thickness:** 1/4 inch (6.35 mm).
 - e. **Face:** Plain with cushion edges.
 - f. **Basis-of-Design Product:** As shown on Interior Finish Legend on the Drawings.
- B. **Approved Manufacturers for Tile Accessories:** Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
 - 1. **Acrylic Emulsion for Latex Portland Cement Mortars and Grouts:**
 - a. BOSTIK CONSTRUCTION PRODUCTS DIV.
 - b. C-CURE CHEMICAL CO.
 - c. LATICRETE INTERNATIONAL, INC.
 - d. MAPEI, INC.

2.2 PRODUCTS, GENERAL

- A. **ANSI Standard for Ceramic Tile:** Comply with ANSI A137.1 "American National Standard Specifications for Ceramic Tile" for types, compositions, and grades of tile indicated.
- B. **ANSI Standard for Tile Installation Materials:** Comply with ANSI standard referenced with products and materials indicated for setting and grouting.
- C. **Colors, Textures, and Patterns:** Provide selections as indicated in the "Ceramic Tile Schedule" at the end of this Section.
 - 1. Provide tile trim and accessories that match color and finish of adjoining flat tile unless otherwise indicated.
- D. **Factory Blending:** For tile exhibiting color variations within the ranges selected during sample submittals, blend tile in factory and package accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.
- E. **Mounting:** Where factory-mounted tile is required, provide back or edge-mounted tile assemblies as standard with manufacturer unless another mounting method is indicated.

2.3 TILE PRODUCTS

- A. **Tile Products:** Refer to the INTERIOR FINISH LEGEND on the Drawings for manufacturer, size, shape, color selections and additional information.
- B. **Trim Units:** Provide tile trim units to match characteristics of adjoining flat tile and to comply with 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. **Shapes:** As follows, selected from manufacturer's standard shapes:
 - b. **Wainscot Cap:** Surface Bullnose.
 - c. **External Corners:** Bullnose shape with a radius of at least ½ inch unless otherwise indicated.
 - d. **Internal Corners:** Coved (round-in) styled; use coved base and cap angle pieces designed to member with stretcher shapes.

2.4 MORTAR FOR CERAMIC TILE

- A. **Portland Cement Mortar Bed Method:** Mortar consisting of ASTM C150 Portland Cement with latex additive, ASTM C144 sand and potable water complying with quality established by ANSI A108.1.
- B. **Thin-Set Method:** ANSI A118.4, Latex Portland Cement Mortar.

2.5 SETTING BED MATERIALS FOR TILE

- A. **Thin-Set Latex-Portland Cement Mortar:** ANSI A118.4, composed as follows:
 - 1. Manufacturer: Mapei Corp.
 - a. Product: Kerabond Premium White Mortar Powder Dry Mortar with Keralastic Polymer Additive.
 - 2. Manufacturer: Laticrete International Inc.
 - a. Product: 211Crete Filler Powder, White, with 4237 Latex Mortar Additive.
- B. **Organic Adhesive:** ANSI A136.1, Type I for Tiles
 - 1. Manufacturer: Laticrete International, Inc.
 - a. Product: Superflex #333 with White Thin-set

2.6 EPOXY GROUT

- A. **Water-Cleanable, Tile-Setting and -Grouting Epoxy:** ANSI A118.3, grout color as selected by Architect from manufacturer's full range of colors.
 - 1. Manufacturer: Mapei Corp.
 - a. Product: Kerapoxy
 - 2. Manufacturer: Laticrete International Inc.
 - a. Product: SpectraLOCK

2.7 GROUT AND TILE SEALERS

- A. **Silicone Sealers:** Colorless, penetrating, highly polymerized resin for use on grout joints and unglazed tile.
 - 1. Approved Products/Manufacturers:
 - a. "Magic Seal"; BOSTIK HYDROMET.
 - b. "Silicone Grout Sealer"; L & M MANUFACTURING CO.
 - c. Approved equal.

2.8 CEMENTITIOUS BACKER UNITS

- A. **Approved Products/Manufacturers:** Subject to compliance with requirements provide one of the following:
 - 1. "DUROCK Interior Cement Board"; UNITED STATES GYPSUM CO.
 - 2. "DomCrete Cementitious Tile-Backer Board"; DOMTAR GYPSUM.
 - 3. "Util-A-Crete Concrete Backer Board"; FINPAN, INC.
 - 4. "Glas-crete Cementitious Backer Board"; GLASCRETE, INC.
 - 5. "Wonder-Board"; GLASCRETE, INC.
 - 6. Approved equal.
- B. **Description:** Provide cementitious backer units complying with ANSI A118.9, in maximum lengths available to minimize end-to-end butt joints, and as follows:

1. Manufacturer's standard thickness but not less than 7/16 inch, unless otherwise indicated.
 2. Manufacturer's standard width, but not less than 32 inches.
- C. **Joint Treatment Material:** Provide materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
1. For filling joints and treating fasteners of cementitious backer units for application of ceramic tile, use materials recommended by the board manufacturer.
- D. **Joint Tape for Cementitious Backer Units:** Polymer-coated, open glass-fiber mesh.
- E. **Joint Compound for Cementitious Backer Unit:** Material recommended by cementitious backer unit manufacturer.

2.9 MIXING MORTARS AND GROUT

- A. **Mixing:** Mix mortars and grouts to comply with requirements of referenced standards and manufacturers 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. Mortars and grout for tiles shall be pure white, grouts for ceramic tiles must be mixed to each separate ceramic tile color. Submit mock-up of each ceramic tile with corresponding colored grout for approval before installation

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Examination:** Examine substrates and areas 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, and free from oil or waxy films and curing compounds.
 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.
- B. **Acceptance:** Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. **Blending:** For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION, GENERAL

- A. **ANSI Tile Installation Standard:** Comply with parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile" that apply to type of setting and grouting materials and methods indicated.
- B. **TCA Installation Guidelines:** TCA "Handbook for Ceramic Tile Installation"; comply with TCA installation methods indicated.
- C. **Workmanship:** Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions except as otherwise shown. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
 - 1. 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 that plates, collars, or covers overlap tile.
- D. **Jointing Pattern:** Unless otherwise shown, lay tile in grid pattern. 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 shown.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.
- E. **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 installation of tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
 - 2. Prepare joints and apply sealants to comply with requirements of "Section 07920 - Joint Sealants."
- F. **Grouting:** Grout tile to comply with the requirements of ANSI A108.10 for latex portland cement grout.
- G. **Mildew-Resistant Sealant:** Use where tile abuts plumbing fixtures, countertops, and items penetrating tile walls, wainscots and bases, such as pipes and outlets. Refer to "Section 07920 - Joint Sealants".
- H. **Tile Backer Board:** At wall tile applications, install backer board over metal studs in accordance with manufacturer's instructions. Tape joints and corners; cover with skim coat of dry-set mortar to a featheredge.

3.4 CERAMIC TILE INSTALLATION METHODS

- A. **General:** Install mortar bed, tile, and grout in accordance with manufacturer's instructions and TCA Handbook for Ceramic Tile Installation.
 - 1. Floors - Thin-Set:..... TCA # F115.
 - 2. Walls (Cement Backer Board) - Thin-Set: TCA # W244

3.5 CLEANING AND PROTECTION

- A. **Cleaning:** Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove epoxy grout residue from tile as soon as possible.
- B. **Finished Tile Work:** Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.
 - 1. Joints shall be uniform in width; straight, level, plumb and aligned in both directions; neatly grouted without irregularities, holes and gaps.
 - 2. Tile, trim, and stone thresholds shall be the colors, patterns and textures indicated for each location, and shall match the approved samples.
 - 3. Exposed surfaces of tile and trim units shall be uniform and even in plane, without offsets over 1/32-inch in adjacent units.
 - 4. Cut edges of tile and trim units shall be concealed by joint grout, sealant, or overlapping escutcheons of penetrating items.
- C. **Grout and Tile Sealer:** After grout has fully cured, apply sealer to grout joints and unglazed tile surfaces in accordance with manufacturer's instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.
- D. **Protection:** Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensures that tile is without damage or deterioration.
 - 1. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
 - 2. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.
- E. **Before final inspection,** remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION