

SECTION 09 30 00
TILING

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American National Standards Institute (ANSI):
 - a. A108.1A, Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar.
 - b. A108.1B, Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar.
 - c. A108.1C, Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar.
 - d. A108.10, Installation of Grout in Tilework.
 - e. A108.11, Interior Installation of Cementitious Backer Units.
 - f. A118.1, Dry-Set Portland Cement Mortar.
 - g. A118.4, Latex-Portland Cement Mortar.
 - h. A118.6, Standard Cement Grouts for Tile Installation.
 - i. A118.10, Load Bearing, Bonded, Waterproof Membranes for Thin-set Ceramic Tile and Dimension Stone Installation.
 - j. A137.1, Ceramic Tile.
2. ASTM International (ASTM):
 - a. C144, Standard Specification for Aggregate for Masonry Mortar.
 - b. C150, Standard Specification for Portland Cement.
 - c. C206, Standard Specification for Finishing Hydrated Lime.
 - d. C207, Standard Specification for Hydrated Lime for Masonry Purposes.
 - e. C267, Standard Test Method for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes.
 - f. C847, Standard Specification for Metal Lath.
 - g. C920, Standard Specification for Elastomeric Joint Sealants.
 - h. D226, Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
3. South Coast Air Quality Management District: SCAQMD Rule 1168 – Adhesive and Sealant Applications.
4. Tile Council of North America (TCA): Handbook for Ceramic Tile Installation.

1.02 SUBMITTALS

A. Action Submittals:

1. Samples:
 - a. Two for each color, pattern, and type of tile specified.
 - b. Size: Approximately 12 inches square.
 - c. Mark Samples clearly to indicate color or shade, location in which to be used, and manufacturer's name.

B. Informational Submittals:

1. Certification of Compliance: For tile, mortar, grouts, and adhesives.
2. Manufacturer's Instructions: For storage, mixing, application, cleanup, and use of proposed mortars, grouts, and adhesives.
3. Tile Manufacturer's Maintenance Guidelines: For Contracting Officer's use in maintaining ceramic tilework specified herein.
4. Sustainable Design:
 - a. In accordance with Section 01 81 13, Sustainable Design Requirements for Non-LEED™ Projects: Requirements for sustainable design submittals.
5. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
 - a. Materials Resources Certificates:
 - 1) Certify recycled material content for recycled content products.
 - 2) Certify source for local and regional materials and distance from Project Site.
 - b. Indoor Air Quality Certificates: Certify volatile organic compound content for each interior adhesive, sealant, and related primer.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with TCA Handbook and ANSI A108 Series/A118 Series.

B. Mock-up and Layout:

1. Construct mock-up with vertical portion 4 feet long by 4 feet wide and horizontal portion 8 inches wide, with finish grout. Include all tile types, colors and shapes to simulate design. Mock-up shall include inside and outside wall corners as well as wall to floor joints. The accepted mock-up will serve as a standard of workmanship by which similar work will be evaluated.
2. Locate where directed by Contracting Officer and do not remove mock-up until directed by Contracting Officer.

3. Prior to commencing installation of tile, erect layout lines demonstrating proposed tile joint locations and cut tiles for approval by Contracting Officer.
- C. Perform Work in accordance with State of Arizona standard.
- D. Maintain one copy of each document on Site.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Set and grout tile in portland cement mortar when ambient temperature is at least 50 degrees F and rising. Follow ANSI A108.1A or ANSI A108.1B, as recommended by ANSI A108.1C.
- B. Comply with minimum temperature recommendations of manufacturers for bonding and grouting materials other than portland cement mortar.

1.05 EXTRA MATERIALS

- A. Tile: Furnish extra 2 percent of each tile used in clean, marked cartons for future use.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Daltile Corp.
- B. Or equal.

2.02 MATERIALS

- A. Physical Characteristics:
 1. Unglazed Paver Tile:
 - a. ANSI A137.1, Section 5.3, porcelain type, cushion edge, minimum thickness 3/8 inch, nominal face size 4 inches by 4 inches.
 - b. Color: As scheduled on the Drawings.
 2. Glazed Wall Tile:
 - a. ANSI A137.1, Section 6.1.
 - b. Cushion edges with spacer lugs, face finished with colored matte glaze, nominal face size 3 inches by 6 inches.
 - c. Color: As scheduled on the Drawings.
 3. Trim Shapes and Bases: Type, color, and finish to match wall tiles.
 4. Metal Lath and Accessories for Scratch Coat:
 - a. ASTM C847, diamond mesh, flat expanded, galvanized metal weighing not less than 2.5 pounds per square yard.

- b. Nails: 1-1/2-inch galvanized barbed roofing nails with 7/16-inch head or galvanized self-furring nails at wood studs.
 - c. 18-gauge galvanized steel wire for lacing laps and securing metal lath to metal studs.
- 5. Portland Cement Mortar:
 - a. Portland Cement: ASTM C150, Type 1.
 - b. Sand: ASTM C144.
 - c. Hydrated Lime: ASTM C206 or ASTM C207, Type S.
 - d. Water: Clean and potable.
 - e. Mortar Bed Reinforcement:
 - 1) Either of the following:
 - a) Welded Wire Fabric: ASTM A497/497M, size 2-inch by 2-inch mesh, 16/16 wire.
 - b) Expanded Metal Reinforcement: ASTM C847, galvanized with minimum weight of 1.8 pounds per square yard.
- 6. Dry-Set Mortar: ANSI A118.1, TCA Formula 759, gray.
- 7. Latex-Portland Cement Mortar: ANSI A118.4.
- 8. Sand-Portland Cement Grout:
 - a. Portland Cement: ASTM C150.
 - b. Fine-Graded Sand: ASTM C144.
 - c. Hydrated Lime: ASTM C206 or ASTM C207, Type S.
 - d. Water: Clean and potable.
 - e. Mix:
 - 1) For Ceramic Mosaic Tile: 1 part portland cement to 1 part fine-graded sand.
 - 2) For Quarry Tile and Pavers: 1 part portland cement to 2 parts fine-graded sand, and up to 1/5 part hydrated lime by volume.
- 9. Latex-Portland Cement Grout: Portland cement grout with latex additive, commercial quality, ANSI A118.6.

B. Functional Characteristics: None.

C. Performance Characteristics:

- 1. Tile: Standard grade, ANSI A137.1.

2.03 ANCILLARY MATERIALS

A. Physical Characteristics:

- 1. Expansion Joints:
 - a. Sealant: Silicone rubber type, meeting ASTM C920, Type S, Grade P, Class 25, Use T, color to match grout, with Shore A

- hardness of minimum 25 for joints in horizontal surfaces and minimum 35 in traffic areas.
 - b. Backup Material: Flexible and compressible type, nonstaining and compatible with sealants used.
 - 2. Edge Strips:
 - a. Manufacturer:
 - 1) Schluter.
 - 2) Or equal.
 - b. Physical Characteristics:
 - 1) Prefabricated aluminum flat bar.
 - 2) 1/8 inch by depth of tile and mortar.
 - 3) Color: Pewter.
 - c. Function Characteristics: None.
 - d. Performance Characteristics: None.
 - 3. Sealer:
 - a. Manufacturer:
 - 1) Hillyard Chemical Co.
 - 2) Or equal.
 - b. Physical Characteristics:
 - 1) Water-based formula.
 - 2) Finish: Non-gloss translucent.
 - c. Functional Characteristics: None.
 - d. Performance Characteristics: None.
 - 4. Waterproof Membrane: ANSI A118.10.
 - 5. Cleavage Membrane: Either asphalt-saturated organic felt meeting ASTM D226, Type I, plain, or polyethylene sheeting with a minimum thickness of 4 mil.
 - 6. Cementitious Backer Board: As specified in Section 09 29 00, Gypsum Board.
 - 7. Tile Cleaner: Neutral tile cleaner solution acceptable to tile manufacturer.
 - 8. Construction Paper: Heavy-duty, nonstaining kraft paper.
- B. Functional Characteristics: None.
- C. Performance Characteristics: None.

PART 3 EXECUTION

3.01 PREPARATION

- A. Examine surfaces to receive ceramic tile, setting beds, or accessories prior to tile installation.
- B. Correct defects or adverse conditions affecting quality and execution of tile installation.

- C. Surfaces to receive tile shall be plumb, level, and true with square corners.
- D. Tolerances for Surfaces to Receive Tile:
 - 1. Portland Cement and Dry-Set Mortar Methods:
 - a. Maximum Variation in Subfloor Surface: 1/4 inch in 10 feet.
 - b. Maximum Variation in Vertical Surfaces: 1/4 inch in 8 feet.
 - 2. Organic Adhesive Method:
 - a. Maximum Variation in Subfloor Surface: 1/16 inch in 3 feet.
 - b. Maximum Height of Abrupt Irregularities: 1/32 inch.
 - c. Maximum Variation in Vertical and Ceiling Surfaces: 1/8 inch in 8 feet.
- E. Grounds, anchors, plugs, hangers, bucks, electrical and mechanical work, in or behind tile, to be installed prior to proceeding with tilework.
- F. Protection: Protect adjoining work surfaces before tilework begins.
- G. Make substrate firm, dry, clean, and free of oily or waxy films.

3.02 INSTALLATION

- A. Prepare surfaces, fit, set, or bond tile, grout and clean tile in accordance with applicable requirements of ANSI Standards for setting method specified, except as otherwise noted.
- B. Workmanship, Cutting, Fitting, and Grout Joint Size:
 - 1. Center and balance areas of tile.
 - 2. Generally start full size tiles at outside corners and leave cut tiles for inside corners.
 - 3. Tile Cutting:
 - a. Minimize number of cuts.
 - b. No cuts smaller than half size without approval of Contracting Officer.
 - c. Make all cuts on the outer edges of the field.
 - d. Smooth cut edges. Install tile without jagged or flaked edges.
 - e. Do not split tile unless no other alternative is possible.
 - 4. Fit tile closely where edges will be covered by trim, escutcheons, or other similar devices.
 - 5. Maintain heights of tile work in full courses to nearest obtainable dimension where heights are given in feet and inches and are not required to fill vertical spaces exactly.
 - 6. Allowable Lippage: 1/32 inch.
 - 7. Grout Joint Size: 3/16 inch.

8. Install accessories in tile work to be evenly spaced, properly centered with tile joints, and level, plumb, and true to the correct projection. Install accessories at locations and heights shown or designated.
- C. Trim: Provide bases, caps, stops, returns, trimmers, and other shapes to finish installation.
- D. Setting Wall Tile (Thin-Set Application):
1. On Gypsum Board Over Metal Studs: Meet TCA Method W242.
 2. On Cementitious Backer Board Over Wood or Metal Studs at Shower Compartment Walls: Meet TCA Method W244C.
 3. Use latex-portland cement grout.
- E. Setting Floor Tile (Thin-Set Application):
1. On Concrete: Meet TCA Method F113 with latex-portland cement grout.
- F. Setting Floor Tile (Conventional Application):
1. On Shower Compartment Floor: Meet TCA Method B415.
- G. Edge Strips:
1. At openings without thresholds and similar discontinuous edges of thin-set tile floors.
 2. Where ceramic tile floors are adjacent to other flooring material at same level.
 3. Where ceramic tile cove base is combined with other types of flooring.

3.03 CLEANING AND SEALING

- A. Clean tile surfaces thoroughly on completion of grouting.
- B. Remove grout haze, observing tile manufacturer's recommendations as to use of acid and chemical cleaners.
- C. Rinse tilework thoroughly with clean water before and after using chemical cleaners.
- D. Polish surface of glazed tilework with soft cloth.
- E. After grout has cured for 10 days, clean and seal nonglazed tiles following sealer manufacturer's instructions and recommendations.

3.04 PROTECTION

A. From Construction Dirt:

1. Apply protective coat of neutral cleaner solution, one part cleaner to one part water, to clean completed tile walls and floors.
2. Cover tile floors with heavy-duty, nonstaining construction paper, masked in-place.
3. Just before substantial completion, remove paper and rinse protective coat of neutral cleaner from tile surfaces.

B. From Traffic:

1. Prohibit foot and wheel traffic from using newly tiled floors for at least 7 days.
2. Place large, flat boards in walkways and wheelways for 7 days where use of newly tiled floor with cement type grout is unavoidable.

END OF SECTION