

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. Types: 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