

MODULAR PAVER DETECTABLE/TACTILE WARNING SURFACES

SECTION 09614 DETECTABLE/TACTILE WARNING SURFACES

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For more relevant information, please visit the Armor Tile website. This website is an excellent resource on ADA solutions, ADA regulations and requirements, truncated domes, detectable warning surface tiles and more.

You will find extensive content in the form of PDF files, Videos, Images, Word Documents, Power Point Presentations, Flash Presentations and AutoCAD Drawings on the Armor Tile website, by clicking the link below. Be sure to bookmark the Armor Tile site as a favorite.

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SECTION 09614

DETECTABLE/TACTILE WARNING SURFACES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 Specifications Section, apply to this Section.

1.02 DESCRIPTION

- A. This Section specifies furnishing and installing Modular Paver Detectable/Tactile Warning Surface Tiles pre-cast with a 1 3/8" thick reinforced epoxy polymer concrete core where indicated.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's literature describing products, installation procedures and routine maintenance.
- B. Samples for Verification Purposes: Submit two (2) tile samples minimum 6"x6" of the kind proposed for use.
- C. Shop drawings are required for products specified showing fabrication details, composite structural system, plans of tile placement including joints and material to be used as well as outlining installation materials and procedure.
- D. Material Test Reports: Submit complete test reports from qualified accredited independent testing laboratory's to qualify that materials proposed for use are in compliance with requirements and meet or exceed the properties indicated in the specifications. All tests shall be conducted on a Modular Paver Detectable/Tactile Warning Surface Tile system as certified by a qualified independent testing laboratory and be current within a 24 month period.
- E. Maintenance Instructions: Submit copies of manufacturer's specified maintenance practices for each type of Detectable Warning Surface Tile and accessory as required.

1.04 QUALITY ASSURANCE

- A. Provide Modular Paver Detectable/Tactile Warning Surface Tiles and accessories as produced by a single manufacturer with a minimum of three (3) years experience in the manufacturing of Modular Paver Detectable/Tactile Warning Surface Tiles.
- B. Installer's Qualifications: Engage an experienced Installer certified in writing by Modular Paver Detectable/Tactile Warning Surface Tile manufacturer as qualified for installation, who has successfully completed installations similar in material, design, and extent to that indicated for Project.
- C. Americans with Disabilities Act (ADA): Provide Modular Paver Detectable/Tactile Warning Surface Tiles which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title III Regulations, 28 CFR Part 36 ADA STANDARDS FOR ACCESSIBLE DESIGN, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).
- D. California Code of Regulations (CCR): Provide only approved DSAAC detectable warning products as provided in the California Code of Regulations (CCR) Title 24, Part 2, Section 205 definition of "Detectable Warning". Section 1117A.4 and 1127B.5 for "Curb Ramps" and Section 1133B.8.5 for "Detectable Warnings at Hazardous Vehicular Areas".
- E. Vitrified Polymer Composite (VPC) Modular Paver Detectable/Tactile Warning Surface Tiles shall be an epoxy polymer composition with an ultra violet stabilized coating employing aluminum oxide particles in the truncated domes. The tile shall incorporate an in-line pattern of truncated domes measuring nominal 0.2" height, 0.9" base diameter, and 0.45" top diameter, spaced center-to-center 2.35" as measured on a diagonal and 1.70" as measured side by side. For wheelchair safety the field area shall consist of a non-slip surface with a minimum of 40 - 90° raised points 0.045" high, per square inch; "Armor-Tile" as manufactured by Engineered Plastics Inc., Tel: 800-682-2525, or approved equal.

1. Dimensions: Modular Paver Detectable/Tactile Warning Surface Tiles shall be held within the following dimensions and tolerances:

Specifiers Note: Edit section below by selecting desired length and width. Delete non-relevant dimensions.

Length and Width: [12x12] [24x24] nominal
Depth: 1.375 (1-3/8") (+/-) 5% max.
Face Thickness: 0.1875 (1-3/8") (+/-) 5% max.
Warpage of Edge: 0.5% max.

2. Water Absorption of Tile when tested by ASTM D 570-98 not to exceed 0.05%.
3. Slip Resistance of Tile when tested by ASTM C 1028-96 Wet/Dry Static Co-efficient of Friction values are not to be less than 0.80 on top of domes and field area.
4. Compressive Strength of Tile when tested by ASTM D 695-02 not to be less than 28,000 psi.
5. Tensile Strength of Tile when tested by ASTM D 638-03 not to be less than 19,000 psi.
6. Flexural Strength of Tile when tested by ASTM D 790-03 not to be less than 25,000 psi.
7. Chemical Stain Resistance of Tile when tested by ASTM D 543-95 (re approved 2001) to withstand without discoloration or staining - 10% hydrochloric acid, urine, saturated calcium chloride, black stamp pad ink, chewing gum, red aerosol paint, 10% ammonium hydroxide, 1% soap solution, turpentine, Urea 5%, diesel fuel and motor oil.
8. Abrasive Wear of Tile when tested by BYK - Gardner Tester ASTM D 2486-00* (*ATX-G-U Standard) with reciprocating linear motion of $37 \pm$ cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sand paper, to be fixed and leveled to a holder. The combined mass of the sled, weight and wood block is to be 3.2 lb. Average wear depth shall not exceed 0.06 after 1000 abrasion cycles measured on the top surface of the dome representing the average of six measurement locations per sample.
9. Resistance to wear of unglazed ceramic tile by Taber Abrasion per ASTM C501-84 (re approved 2002) shall not be less than 500.
10. Fire Resistance of Tile when tested to ASTM E 84-05 flame spread be less than 15.
11. Gardner Impact to Geometry "GE" of the standard when tested by ASTM D 5420-04 to have a mean failure energy expressed as a function of specimen thickness of not less than 550 in. lbf/in. A failure is noted when a crack is visible on either surface or when any brittle splitting is observed on the bottom plaque in the specimen.
12. Accelerated Weathering of Tile when tested by ASTM G 155-05a for 3000 hours shall exhibit the following result – $\Delta E < 4.5$, as well as no deterioration, fading or chalking of surface of tile color No 33538.
13. Accelerated Aging and Freeze Thaw Test of Tile and Structural Embedment Flange System when tested to ASTM D 1037-99 shall show no evidence of cracking, delamination, warpage, checking, blistering, color change, loosening of tiles or other detrimental defects.
14. Salt and Spray Performance of Tile and Structural Embedment Flange System when tested to ASTM B 117-03 not to show any deterioration or other defects after 200 hours of exposure.
15. Polymer Concrete and/or Epoxy Resin properties shall meet or exceed the following criteria:
 1. Tensile Strength of Resin: greater than 7,000psi; ASTM D 638
 2. Modulus of Elasticity of Resin: greater than 4,000psi; ASTM D 638
 3. Bond Strength of Polymeric Concrete: greater than 8,000psi; ASTM C 551

1.05 DELIVERY, STORAGE AND HANDLING

- A. Modular Paver Detectable/Tactile Warning Surface Tiles shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings and tile type shall be identified by part number.
- B. Modular Paver Detectable/Tactile Warning Surface Tiles shall be delivered to location at building site for storage prior to installation.

1.06 SITE CONDITIONS

- A. Environmental Conditions and Protection: Maintain minimum temperature of 40°F in spaces to receive Modular Paver Detectable/Tactile Warning Surface Tiles for at least 24 hours prior to installation, during installation, and for not less than 24 hours after installation.
- B. The use of water for work, cleaning or dust control, etc. shall be contained and controlled and shall not be allowed to come into contact with the general public. Provide barricades or screens to protect the general public.

1.07 GUARANTEE

- A. Modular Paver Detectable/Tactile Warning Surface Tiles shall be guaranteed in writing for a period of five (5) years from date of final completion. The guarantee includes defective work, breakage, deformation, fading and loosening of tiles.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The Vitrified Polymer Composite (VPC) Modular Paver Detectable/Tactile Warning Surface Tile specified is based on Armor-Tile manufactured by Engineered Plastics Inc. (800-682-2525). Existing engineered and field tested products, which have been in successful service for a period of three (3) years are subject to compliance with requirements, may be incorporated in the work and shall meet or exceed the specified test criteria and characteristics.
- B. Color: Yellow conforming to Federal Color No. 33538. Color shall be homogeneous throughout the tile. Tiles are also available in Light Grey (Federal Color No. 26280), Dark Grey (Federal Color No. 36118), Onyx Black (Federal Color No. 17038), Pearl White (Federal Color No. 37875), Brick Red (Federal Color No. 22144), Ocean Blue (Federal Color No. 15187), Ochre Yellow (Federal Color No. 23594), and Colonial Red (Federal Color No. 20109).

PART 3 EXECUTION

3.01 INSTALLATION

- A. During all Modular Paver Detectable/Tactile Warning Surface Tile installation procedures ensure adequate safety guidelines are in place in accordance with the applicable industry and government standards.
- B. The specifications of the urethane sealants and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers.
- C. Modular Paver Detectable/Tactile Warning Surface Tiles shall have a structural epoxy polymer concrete core installed by the manufacturer.
- D. Prior to placement of the Modular Paver Detectable/Tactile Warning Surface Tiles, review manufacturer and contract drawings with Contractor prior to the construction and refer any and all discrepancies to the Engineer
- E. Layout Modular Paver Detectable/Tactile Warning Surface Tiles and joints to fit existing spacing as detailed on the project drawings.
- F. Immediately setting the Modular Paver Detectable/Tactile Warning Surface Tiles, electronic level should be used to check that the required slope is achieved. The tiles shall be placed true and square to the curb edge in accordance with the contract drawings. The Modular Paver Detectable/Tactile Warning Surface Tiles shall be tamped or vibrated onto the engineered crushed gravel substrate to ensure that the field level of tile is flush to the adjacent surfaces. The contract drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes. The tolerance for elevation differences between tile and adjacent surface is 1/16".
- G. Vacuum clean, mechanically abrade and solvent wipe the joints between Modular Paver Detectable/Tactile Warning Surface Tiles.
- H. Place 3/8" diameter foam rope at bottom of all joints.
- I. Tape off each side of leading edge groove in preparation for the self leveling urethane sealant.
- J. Apply urethane sealant in joints filling flush to top of Modular Paver Detectable/Tactile Warning Surface Tiles then remove tape prior to curing.

3.02 CLEANING, PROTECTING AND MAINTENANCE

- A. Protect tiles against damage during construction period to comply with Tactile Tile manufacturer's specification.
- B. Protect tiles against damage from rolling loads following installation by covering with plywood or hardwood.
- C. Clean Tactile Tiles not more than four days prior to date scheduled for inspection intended to establish date of substantial completion in each area of project. Clean Tactile Tile by method specified by Tactile Tile manufacturer.
- D. Comply with manufacturers maintenance manual for cleaning and maintaining tile surface and it is recommended to perform annual inspections for safety and tile integrity.

END OF SECTION