



## **MODULAR PAVING DETECTABLE/TACTILE WARNING SURFACE TILE**

### **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 Paving Detectable/Tactile Warning Surface Tiles 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 one (1) 12" x 12" full size tile sample.
- C. Shop drawings are required for products specified showing fabrication details, composite structural system, tile surface profile, fastener locations, 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 laboratories to qualify that materials proposed for use are in compliance with requirements and meet or exceed the properties indicated on the specifications. All tests shall be conducted on a Modular Paving Warning tile (or approved equal) as certified by a qualified independent testing laboratory.
- E. Maintenance Instructions: Submit copies of manufacturer's specified installation and maintenance practices for each type of Warning tile and accessory as required.

#### **1.04 QUALITY ASSURANCE**

- A. Provide Modular Paving Warning tiles and accessories as produced by a single manufacturer with a minimum of three (3) years' experience in the manufacturing of Modular Paving Warning tiles.
- B. Installer's Qualifications: Engage an experienced installer certified in writing by Modular Paving Warning tile manufacturer as qualified for installation, who has successfully completed installations similar in material, design, and extent to that indicated for the project.
- C. Provide Modular Paving Warning tiles which are in compliance with the following standards (or most recent):
  - a. 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).
  - b. 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

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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".

- D. Vitrified Polymer Composite (VPC) Modular Paving Warning tiles shall be an epoxy polymer composition with a ultra-violet coating employing aluminum oxide particles in the truncated domes; "Armor Tile" as distributed under license by Engineered Plastics (1-800-682-2525), or approved equal.
- E. Dimensions: The tile shall incorporate an in-line pattern of truncated domes measuring nominal 0.2" height, 0.9" base diameter, 0.45" top diameter spaced center-to-center 2.35" as measured on a diagonal and 1.67" as measured side by side in-line. 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. Modular Paving Warning tiles shall be held within the following dimensions and tolerances:

Part No.	Size [in x in]
ADA-P-1212	12 x 12
ADA-P-2424	24 x 24
<i>Note: Dimensional tolerances ± 5%</i>	

- F. Product Data: Vitrified Polymer Composite (VPC) Modular Paving Warning tiles shall meet or exceed the following test criteria:

Test Reference	Test Description	Value
AASHTO-HS 20	Wheel Load Tests	No Failure
ASTM D 695	Compressive Strength	≥ 28,000 psi
ASTM D 790	Flexural Strength	≥ 25,000 psi
ASTM D 638	Tensile Strength	≥ 19,000 psi
ASTM D 5420	Impact Resistance	≥ 550 in-lbf/in
ASTM D 696	Coefficient of Thermal Expansion	2.78 x 10 <sup>-6</sup> /°F
ASTM C 1028	Static Coefficient of Friction	≥ 0.80
ASTM E 84	Flame Spread Index	≤ 25
ASTM D 570	Water Absorption	≤ 0.05%
ASTM C 501	Abrasive Wear Index Iw	≥ 500
ASTM D 2486	Abrasive Scrub Test	≤ 0.06

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ASTM B 117	Salt Spray (300 hrs)	No Failure
ASTM D 1037	Accelerated Aging Cycle Testing	No Failure
ASTM D 543	Chemical Resistance	No Failure
ASTM G 155	Accelerated Weathering	$\Delta E < 4.5$
ASTM C 551	Bond Strength (Polymeric Concrete)	> 8,000 psi

### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Modular Paving Warning tiles shall be suitably packaged or crated to prevent damage in shipment and handling. Finished surfaces shall be protected by sturdy plastic wrappings to protect tile from concrete residue during installation and tile type shall be identified by part number.
- B. Modular Paving Warning 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 Paving Warning 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 MANUFACTURER'S WARRANTY**

- A. Modular Paving Warning tiles shall be warranted in writing for a period of five (5) years from date of substantial completion. The guarantee includes factory defects, breakage, and deformation.

### **1.08 INSTALLATION WARRANTY**

- A. Modular Paving Warning tile installation shall be warranted in writing for a period of two (2) years. Alternate products approved during the tendering process must be guaranteed for an additional three (3) years. Product must be guaranteed from defective work.

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### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. The Vitrified Polymer Composite (VPC) Modular Paving Detectable/Tactile Warning Surface Tile specified is based on Armor Tile as distributed under license by Engineered Plastics (1-800-682-2525). 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: Color shall be homogeneous throughout the tile.

Color	Federal Color No.
Federal Yellow	33538
Light Gray	26280
Dark Gray	36118
Onyx Black	17038
Pearl White	37835
Brick Red	22144
Ocean Blue	15817
Ochre Yellow	23594
Colonial Red (Brown)	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.

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- 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 Warning tile manufacturer's specification.
- B. Protect tiles against damage from rolling loads following installation by covering with plywood or hardwood.
- C. Clean 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 tile by method specified by tile manufacturer.
- D. Comply with manufacturer's maintenance manual for cleaning and maintaining tile surface and it is recommended to perform annual inspections for safety and integrity.

### **END OF SECTION**