

## CAST-IN-PLACE TACTILE PANELS

### SECTION 09310

#### **PART 1 GENERAL**

##### **1. related documents**

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

#### **B. DESCRIPTION**

- A. This Section specifies furnishing and installing cast-in-place tactile panel modules where indicated.

##### **3. SUBMITTALS**

- A. Product Data: Submit manufacturer's literature describing products, installation procedures and routine maintenance.
- B. Samples for Verification Purposes: Submit three (3) samples of full cast-in-place tactile panels of the kind proposed for use.
- C. Shop drawings are required for products specified showing fabrication details; composite structural system; plans of panel placement including joints, and material to be used as well as outlining installation materials and procedure.
  - 1. Panel pattern shall be designed and shown between existing expansion joints with panel rib dimension used for the cut size of panels.
- D. Material Test Reports: Submit test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties indicated. All test reports shall be conducted on a cast-in-place tactile panel system as certified by a qualified independent testing laboratory.
- A. Maintenance Instructions: Submit copies of manufacturer's specified maintenance practices for each type of tactile panel and accessory as required.

##### **4. QUALITY ASSURANCE**

- A. Provide cast-in-place tactile panels and accessories as produced by a single manufacturer.

- B. Installer's Qualifications: Engage an experienced Installer certified in writing by tactile manufacturer as qualified for installation, who has successfully completed tile installations similar in material, design, and extent to that indicated for Project. Manufacturer's supervisor shall be present at initial pour.
- A. Americans with Disabilities Act (ADA): Provide tactile warning surfaces which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title 49 CFR TRANSPORTATION, Part 37.9 STANDARDS FOR ACCESSIBLE TRANSPORTATION FACILITIES, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES) or through equivalent facilitation.
- B. Vitrified Polymer Composite (VPC) cast-in-place panels shall be an epoxy polymer composition with an ultra violet coating employing aluminum oxide particles in the truncated domes:
1. Water Absorption of Tile when tested by ASTM-D 570 not to exceed 0.35%.
  2. Slip Resistance of Tile when tested by ASTM-C 1028 the combined wet/dry static coefficient of friction not to be less than 0.80.
  3. Compressive Strength of tile when tested by ASTM-D 695-91 not to be less than 18,000 psi.
  4. Tensile Strength of Tile when tested by ASTM-D 638-91 not to be less than 10,000 psi.
  5. Flexural Strength of Tile when tested by ASTM - C293-94 not to be less than 24,000 psi.
  6. Chemical Stain Resistance of Tile when tested by ASTM-D 543-87 to withstand without discoloration or staining - 1% hydrochloric acid, urine, calcium chloride, stamp pad ink, gum and red aerosol paint.
  7. Abrasive Wear of Tile when tested by BYK - Gardner Tester ASTM-D 2486\* 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 to be 3.2 lb. Average wear depth shall not exceed 0.030 after 1000 abrasion cycles measured on the top surface of the dome representing the average of three measurement locations per sample.
  8. Fire Resistance: When tested to ASTM E84 flame spread be less than 25.
  9. Gardner Impact to geometry "GE" of the standard when tested by ASTM-D 5420-93 to have a mean failure energy expressed as a function of specimen thickness of not less than 450 in. 1bf/in. A failure is noted if a hairline fracture is visible in the specimen.
  10. Accelerated Weathering of Tile when tested by ASTM-G26-95 for 2000 hours shall exhibit the following result - no deterioration, fading or chalking of surface of tile.
- E. Vitrified Polymer Composite (VPC) Cast-In-Place Panels embedded in concrete shall meet or exceed the following test criteria:

1. Accelerated Aging and Freeze Thaw Test of Tile when tested to ASTM-D 1037 shall show no evidence of cracking, delamination, warpage, checking, blistering, color change, loosening of tiles or other defects.
2. Salt and Spray Performance of Tile and Adhesive System when tested to ASTM-B 117 not to show any deterioration or other defects after 100 hours of exposure.

## **5. DELIVERY, STORAGE AND HANDLING**

- A. Panels shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings, and panel type shall be identified by part number.
- B. Panels shall be delivered to location at building site for storage prior to installation.

## **6. SITE CONDITIONS**

- A. Environmental Conditions and Protection: Maintain minimum temperature of 40 degrees F in spaces to receive tactile panels for at least 48 hours prior to installations, during installation, and for not less than 48 hours after installation. Store tactile panel material in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 40 degrees F in areas where work is completed.
- 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 passengers or public. Provide barricades or screens to protect passengers or public.
- C. Disposal of any liquids or other materials of possible contamination shall be made in accordance with federal state and local laws and ordinances.
- D. Cleaning materials shall have code acceptable low VOC solvent content and low flammability if used on the site.
- E. Contractor shall coordinate phasing and flagging personnel operations as specified elsewhere.

## **7. EXTRA STOCK**

A. Deliver extra stock to storage area designated by engineer. Furnish new materials from same manufactured lot as materials installed and enclose in protective packaging with appropriate identification for cast-in-place tactile panels. Furnish not less than two (2)% of the supplied materials for each type, color and pattern installed.

## **8. GUARANTEE**

- A. Cast-in-place tactile panels shall be guaranteed in writing for a period of five years from date of final completion. The guarantee includes defective work, breakage, deformation, fading and chalking of finishes, and loosening of panels.

## **Part 2 PRODUCTS**

### **1. MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
- B. The Vitrified Polymer Composite (VPC) Cast-In-Place Tactile Panel specified is based on Armor-Tile manufactured by Engineered Plastics Inc. (800-682-2525). Existing engineered and field tested products which are subject to compliance with requirements, may be considered by the engineer to be incorporated in the work and shall meet or exceed the specified test criteria and characteristics.
  - C. Color: Yellow conforming to Federal Color No. 33538. Color shall be homogeneous throughout the tile.

### **2. MATERIALS**

- A. Heavy duty elastomeric polyurethane sealant as manufactured by Boiardi, Mapei, Bostik or approved equal.

## **PART 3 EXECUTION**

### **1. INSTALLATION**

- A. During all concrete pouring and tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.
- B. The specifications of the concrete sealants and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers.
- C. The physical characteristics of the concrete shall be consistent with the contract specifications while maintaining a slump range of 4 - 7 to permit solid placement of the Cast-In-Place Tile

System. An overly wet mix will cause the Cast-In-Place System to float, therefore under all conditions suitable weights such as concrete blocks or sandbags (25 lb) shall be placed on each 2' x 2' tile module.

- D. Prior to placement of the Cast-In-Place System, the manufacturer's shop drawings shall be reviewed and a layout drawing prepared by the installation contractor to resolve the issues related to pattern repeat, tile cuts, expansion joints, control joints, platform curves, platform end returns and platform surface interferences.
- E. The concrete pouring and finishing operations require typical mason's tools, however, a mason's line, radius edge (1/8 x 3/16" return) tool, 4' long x 2" wide x 1/8" thick steel straight edge, 25 lb. weights, vibrator wand and small sledge hammer with 2" x 6" x 20" wood tamping plate are specific to the installation of the Cast-In Place System.
- F. The concrete shall be poured and finished level, true and smooth to the required dimensions prior to tile placement. Immediately after pouring concrete, a mason's line should be strung parallel to track to act as a reference line for placement of tile, then the tile assembly shall be placed true to the platform edge and to each other on the concrete. The Cast-In-Place tiles shall be tamped or vibrated into the fresh concrete to ensure that the field level of tile is flush to the adjacent concrete or platform edge surface. The shop 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. Immediately after tile placement, the tile elevation is to be checked to adjacent concrete or rubbing board heights with a steel straight edge. The tile elevation should be set consistent with shop drawings to permit water drainage to or away from track as the platform design dictates.
- H. While concrete is workable a steel edging trowel 1/8" radius x 3/16" return is to be used to edge the tile to adjacent concrete surfaces running parallel to track. While edging, ensure that a clean edge definition is created between tile and adjacent concrete and that tile to concrete elevations meet the shop drawing tolerances.
- I. The placement of Cast-In-Place Tile assemblies to each other and to the mason's line or form edge shall be true and parallel to develop a true line consistent with the platform edge. A tight tile to tile placement can best be achieved by raking out the concrete at the butting edge to avoid trapping concrete or aggregate between tiles and/or form edge.
- J. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external forces placed on the tile to rock the tile, causing a void between the underside of tile and concrete.
- K. Following tile placement, review installation tolerances to shop drawings and adjust tile before the concrete sets, suitable weights of 25 lb. shall be placed on each tile and additional weights at tile to tile assemblies as necessary to ensure solid contact of tile underside to concrete.
- L. Following the curing of the concrete, the protective plastic wrap is to be removed from the tile face by cutting the plastic with a sharp knife tight to the concrete/tile interface. If concrete bleeding occurs between tiles, a wire brush will clean the residue without damage to the tile surface.

- M. An elastomeric urethane sealant shall be applied to the tile edges running parallel to the track or curb. Proper surface preparation requires that the tile and adjacent surfaces are mechanically etched with sandpaper or a carbide burr and wiped clean and dry with acetone. Applications of the urethane sealant shall be level to the adjacent surface and a straight line formed to the tile edge. A quality installation of the sealant may require that the tile face be masked off with duct tape to ensure a clean definition of sealant to the adjacent surfaces.

## 2. **CLEANING AND PROTECTING**

- A. Protect panels against damage during construction period to comply with tactile panel manufacturer's specification.
- B. Protect panels against damage from rolling loads following installation by covering with plywood or hardwood.
- C. Clean tactile panels 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 panel by method specified by tactile panel manufacturer.

**--- End of Section ---**