

**SECTION 32 17 26 - TACTILE WARNING SURFACE
DETECTABLE WARNING SURFACE PANELS
SURFACE APPLIED**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION

- A This Section specifies furnishing and installing Surface Applied Detectable Warning Surface Panels where indicated. Not recommended for asphalt applications.

1.3 SUBMITTALS

- A Product Data: Submit manufacturer's literature describing products, installation procedures, and routine maintenance.
- B Samples for Verification Purposes: Submit two (2) samples minimum 12" x 12" (305 x 305 mm) of the kind proposed for use.
- C Shop drawings are required for products specified showing fabrication details, panel surface profile, fastener locations, plans of panel 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.
- E Maintenance Instructions: Submit copies of manufacturer's specified installation and maintenance practices for each type of detectable warning surface panel.

1.4 QUALITY ASSURANCE

- A Provide Surface Applied Detectable Warning Surface Panels and accessories as produced by a single manufacturer with a minimum of three (3) years experience in the manufacturing of tactile walking surface products.
- B Installer's Qualifications: Engage an experienced installer who has successfully completed installations similar in material, design, and extent to that indicated for Project.
- C Surface Applied Detectable Warning Surface Panels shall be compliant with the following guidelines and requirements (applicability may be dependent on project location):

1. APPLICABLE TO UNITED STATES

- a. American Barriers Act (ABA) Accessibility Standards

- b. ADA Accessibility Guidelines (ADAAG)
- c. Department of Transportation ADA Standards for Transportation Facilities (2006)
- d. Department of Justice ADA Standards (2010)
- e. Public Rights-of-Way Accessibility Guidelines (PROWAG)
- f. California Building Standards Code, Title 24, California Code of Regulations
- g. Texas Accessibility Standards (TAS) 2012
- h. AASHTO M 333 Standard Specification for Detectable Warning Surfaces
- i. International Code Council (ICC) A117.1 Accessible and Usable Buildings and Facilities

2. **APPLICABLE TO CANADA**

- a. ISO 23599:2012(E): Assistive Products for Blind & Vision Impaired Persons – Tactile Walking Surf. Indicators
- b. CSA B651-18: Accessible Design for the Built Environment Standard – Section 4.3.5
- c. Integrated Accessibility Standards Regulation 191/11 – Sections 80.25 to 80.29
- d. Ontario Building Code 3.8.3.18. Tactile Attention Indicators
- e. National Building Code of Canada: Section 3.3.1.19 Tactile Walking Surface Indicators

D Surface Applied Detectable Warning Surface Panels shall be manufactured from fiberglass reinforced polymer composite. Panels shall incorporate the following design elements:

- 1. In-line pattern of truncated domes oriented parallel to panel edges
- 2. Dome height of 0.20" (5 mm)
- 3. Dome base diameter of 0.9" (23 mm)
- 4. Dome top diameter of 0.45" (12 mm)
- 5. Dome spacing of 2.35" (59.7 mm) to 2.40" (61 mm) center to center
- 6. Traction elements on top of domes and in the field between dome bases shall consist of a micro texture of raised points 0.05" high (1.2 mm)

E Surface Applied Detectable Warning Surface Panels shall meet or exceed the following test criteria using the most current test methods:

Test Method	Test Description	Value
ASTM D 695	Compressive Strength	≥ 28,900 psi (199.2 Mpa)
ASTM D 790	Flexural Strength	≥ 21,000 psi (144.7 Mpa)
ASTM D 638	Tensile Strength	≥ 11,000 psi (75.8 Mpa)
ASTM D 570	Water Absorption	≤ 0.05%
ASTM C 1028	Slip Resistance	≥ 0.80 wet/dry
ASTM E 84	Flame Spread Index	≤ 25
ASTM B 117	Salt Spray	No Effect
ASTM 1308	Chemical Stain	No Effect
ASTM C 501	Abrasion Resistance (lw)	> 500
ASTM G 155	Accelerated Weathering (2000hrs)	ΔE < 5
AASHTO-H20	Load Bearing at 10,410 lbs.	No Effect
ASTM C 1026	Freeze/Thaw/Heat	No Effect
ASTM D 1037	Accelerated Aging	No Effect

1.5 DELIVERY, STORAGE AND HANDLING

A Surface Applied Detectable Warning Surface Panels shall be packaged to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings and products shall be identified by part number.

- B Surface Applied Detectable Warning Surface Panels shall be delivered to a location at the building site for storage before installation. Store panels in an area that is within an acceptable temperature range 40°F - 90°F (4°C - 32°C) and maintain the storage facility in a clean, dry condition to prevent contamination or damage to the panels.

1.6 SITE CONDITIONS

- A Environmental Conditions and Protection: Maintain minimum temperature of 40°F (4°C) in spaces to receive Surface Applied Detectable Warning Surface Panels for at least 24 hours prior to installation, during installation, and for not less than 24 hours after installation.

1.7 WARRANTY

- A Surface Applied Detectable Warning Surface Panels shall be warranted by the manufacturer in writing for a period of five (5) years from date of final completion. The guarantee includes manufacturing defects, breakage, and deformation.
- B Surface Applied Detectable Warning Surface Panel installation shall be warranted in writing for two (2) years by the installer. Products must be guaranteed from defective work and loosening of panels.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. **Armor-Tile** Surface Applied Detectable Warning Surface Panels as manufactured by **SureWerx**, 325 Corporate Drive, Elgin, Illinois 60123. Phone 844-697-2920, orders.ci.usa@surewerx.com, www.armor-tile.com/
 - 1. Panel Sizes (nominal):
 - a. 36" x 48" (915 x 1220 mm)
 - b. 36" x 60" (915 x 1524 mm)
 - 2. Color: Color shall be single, homogeneous color throughout panel and be close approximation of the following AMS-STD-595 color numbers:
 - a. Federal Yellow (YW), Color No. 33538

2.2 MATERIALS

- A. Panel Composition: Surface Applied Detectable Warning Surface Panels shall be manufactured using an exterior grade homogeneous (uniform color throughout thickness of product) fiberglass reinforced polyester based composite material. Truncated domes must contain fiberglass reinforcement within the truncated dome for superior structural integrity and impact resistance. Use of tactile warning surface products employing colored coatings is expressly prohibited.
- B. Fasteners: Nylon sleeve stainless-steel low-profile expansion anchors 1/4 inch diameter by minimum 1-1/2 inch long as supplied by SureWerx with panels.
- C. Adhesive: Heavy duty elastomeric polyurethane adhesive by the following:
 - 1. Bostik Ultra-Set Advanced
 - 2. ChemLink M-1 Structural Adhesive/Sealant

3. or approved equal

PART 3 - EXECUTION

3.1 PREPARATION

- A. The concrete shall be poured and finished, true and smooth to the required dimensions and slope prior to Surface Applied Detectable Warning Surface Panel placement.

3.2 EQUIPMENT

- A. Contractor shall provide all tools, equipment, and services required for satisfactory installation per manufacturer's instruction as Incidental Work. Equipment which may be required include typical mason's tools, a 4-foot level with electronic slope readout, 25 lb. (11.4 kg) weights, and tools for cutting the Detectable Warning Surface Panels.

3.3 INSTALLATION

- A. Contractor will not be allowed to install panels until all submittals have been reviewed and approved by the Engineer. Panels shall be installed per manufacturer's instructions.
- B. To the maximum extent possible, the panels shall be oriented such that the rows of in-line truncated domes are parallel with the direction of the ramp. When multiple panels regardless of size are used, the truncated domes shall be aligned between the panels and throughout the entire tactile warning surface installation.
- C. In accordance with the Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Rights of Way 2011, panels shall be located relative to the curb line as shown within Sections 304 and 305 of the Guidelines.
- D. Cutting of panels may be required to accommodate specific site conditions. All possible attempts shall be made to minimize cutting of the panels. Minimum acceptable width of the cut panel shall be 9".
- E. For proper curing of adhesive and sealant, air and substrate temperatures must maintain a minimum temperature of 40°F (4°C) for at least 8 hours after installation of panels.
- F. Verify that substrate is flat across application area of panel. Field grinding of concrete may be required to remove high spots and assure a flat substrate is achieved prior to panel installation.
- G. Prior to application of adhesive to concrete substrate, remove any residual contamination by mechanical abrasion, sand blasting, or power washing. On green concrete, remove all release agents, friable and loose concrete. Dry all visible and standing water prior to applying adhesive.
- H. Clean the bottom side of the panel with acetone on a clean rag. Wipe around the perimeter and along the internal cross pattern to remove any dirt or dust particles from the area to receive the adhesive.
- I. Apply minimum 3/8" (9.5 mm) bead of adhesive on the backside of panel continuous along both perimeter and interior flat frame surface.
- J. For superior adhesion and panel support in high traffic areas, a full coverage of adhesive may be desired
- K. Set the panel(s) true and square to the curb ramp areas as detailed in the Drawings. Allow 1/8" separation between successive panels for expansion/contraction.

- L. Drill ¼" (6.35 mm) holes to a depth of 2" (50.8 mm) at all fastener locations provided in top of panel. Additional attachment locations may be required at the perimeter of cut panels or as needed to properly secure panel to substrate. Locate new holes through center of truncated domes using a 5 point ½" (12.7 mm) x 82 degree countersink drill bit.
- M. Mechanically fasten panels to the concrete substrate using manufacturer supplied composite sleeve anchors with stainless steel drive pins. Ensure that the fastener has been set to full depth, straight and true. Care should be taken when setting the fastener to avoid striking the surface of the panel.
- N. Apply a continuous bead of sealant around the perimeter edge the installed panel.
- O. Do not allow foot traffic on installed panel until the perimeter edge sealant has fully cured.

3.4 CLEANING AND PROTECTING

- A. Protect panels against damage during construction period to comply with panel manufacturer's Specifications.
- B. Remove strippable protective film from panel within 24 hours of installation of the panel. Note that hot temperatures and excess exposure to sunlight can cause protective film to permanently adhere to panels surface.
- C. If requested by the Project Manager, clean panels not more than four (4) days prior to date scheduled for inspection intended to establish date of substantial completion in each area of project. Clean panel by method specified by Detectable Warning Surface panel manufacturer.

END OF SECTION