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SECTION 32 17 26 – TACTILE WARNING SURFACING

DETECTABLE WARNING SURFACE PANELS
CAST-IN-PLACE PAVER

SECTION 1 - GENERAL

1.1 DESCRIPTION

A This Section includes Specifications for furnishing and installing permanently embedded Cast-In-Place Detectable Warning Surface Panels (CIP) with an in-line truncated dome pattern embedded in concrete at pedestrian crossings, boarding platforms, and rail crossing locations to the dimensions shown on the Drawings, in accordance with the Contract Documents and as directed by the Engineer.

1.2 RELATED DOCUMENT

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

B Department of Justice ADA Standards (2010)

C Department of Transportation ADA Standards for Transportation Facilities (2006)

D Proposed Guidelines for Accessible Public Rights-of-Way (2011)

E California Title 24

F ISO 23599:2019-01 – Assistive products for blind and vision-impaired persons — Tactile walking surface indicators

G ISO 21542:2011 – Building Construction – Accessibility and Usability of the Built Environment

H ISO 9001 – Certificate No. 0502011, ISO 1409 and ISO/B 16949 Certified Manufacturing Facility located in Jefferson, OH

I Accessibility for Ontarians with Disabilities Act - (AODA)

J Canadian Standards Association – (CSA)

1.3 SUBMITTALS

A Product Data Sheet: Submit ADA Solutions literature describing products, installation procedures and routine maintenance.

B Samples for Verification Purposes: Submit two (2) detectable warning surface panel samples. Samples shall be properly labeled and shall contain the following information: Name of Project, Submitted By, Date of Submittal, and Manufacturer's Name.

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C Shop Drawings: Submit the Standard Manufacturer Shop Drawings showing all pertinent characteristics of the Cast-In-Place Detectable Warning Surface Panels (CIP) including profile, panel surface profile, plans of panel placement including joints, and material to be used as well as outlining installation materials and procedures.

D Material Test Reports: Submit all completed current test results from qualified, accredited independent testing laboratories by ASTM and UL/Canada guidelines and indicating that materials proposed for use follow specification requirements and meet or exceed the properties indicated on these specifications.

E Maintenance Instructions: Submit copies of the manufacturer's specified installation and maintenance practices for each type of Detectable Warning Surface panels and accessories as required.

1.4 QUALITY ASSURANCE

A Provide Cast-In-Place Detectable Warning Surface Panels (CIP) and accessories as produced by a single manufacturer with a minimum of five years of experience in manufacturing Cast-In-Place Composite Shell Detectable Warning Surface Panels.

B Installer's Qualifications: Engage an experienced installer certified in writing by Cast-In-Place Detectable Warning Surface Panel (CIP) manufacturer as qualified for installation, who has completed installations similar in material, design, and extent to that indicated for the Contract.

C Cast-In-Place Detectable Warning Surface Panels (CIP) must be compliant with the following guidelines and requirements (applicability may be dependent on project location):

1. American Barriers Act (ABA) Accessibility Standards
2. ADA Accessibility Guidelines (ADAAG)
3. Department of Transportation ADA Standards for Transportation Facilities (2006)
4. Department of Justice ADA Standards (2010)
5. Public Rights-of-Way Accessibility Guidelines (PROWAG)
6. California Building Standards Code, Title 24, California Code of Regulations
7. Texas Accessibility Standards (TAS) 2012
8. AASHTO M 333 Standard Specification for Detectable Warning Surfaces
9. International Code Council (ICC) A117.1 Accessible and Usable Buildings and Facilities

D Cast-In-Place Detectable Warning Surface Panels (CIP) shall meet or exceed the following test criteria using the most current test methods:

Standard	Standard Description	Value
ASTM D695	Compressive Strength	28,900 psi minimum
ASTM D790	Flexural Strength	29,300 psi minimum
ASTM D 638	Tensile Strength	11,600 psi minimum
ASTM C 1028	Standard Test Method for Determining the Static Coefficient of Friction (Slip Resistance)	1.18 Dry / 1.05 Wet
AS HB198:2014 (AS/NZS 4586)	Pendulum Sustainable Slip Resistance (SSR)	Pendulum Test Value (PTV), with Four S (96) hard rubber slider: 56 Dry / 44 Wet; After 500 cycles of abrasion: 34 Wet
ASTM C501	Abrasion Resistance	500 minimum
FM 5-594	Abrasion Resistance, Florida Method	Average Volume Loss: no more than 0.03 cm3

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NTPEP TP103 (2015)	High Temperature Thermal Cycling Exposure, (Sect 14) and Resistance to Impact from Falling Tup (Sect 10)	Min. 60 thermal cycles at 200°F (93.33°C) = maximum damage classification of 'C' at 20 ft-lb impact
ASTM G155	Accelerated Weathering	ΔE<5.0 at 2,000 hours min.
ASTM D570	Water Absorption	0.07%
ASTM C1026	Freeze/Thaw/Heat	No deterioration
ASTM D1037	Freeze/Thaw	No deterioration
ASTM D543	Chemical Stain Resistance	No reaction
ASTM D1308	Chemical Stain Resistance	No reaction
ASTM-B117	Salt and Spray	No change after 200 hours
ASTM E84	Flame Spread Index	20
AASHTO H20	Load Bearing Test	No Damage at 16,000 lbs.

E Stamped concrete, polymer concrete, concrete pavers/tile, or brick products are not acceptable for use on this project.

F Panels shall have four (4) side perimeter flanges a minimum length of 1.375" (34.9 mm); interior embedment flanges spaced a maximum of 3" (76.2 mm).

1.5 DELIVERY, STORAGE AND HANDLING

A Cast-In-Place Detectable Warning Surface Panels (CIP) shall be suitably packaged or crated to prevent damage in shipment and handling. Finished surfaces shall be protected by sturdy plastic wrappings to protect the panel from concrete residue during installation.

B Cast-In-Place Detectable Warning Surface Panels (CIP) 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 a minimum temperature of 40°F (4°C) in spaces to receive Cast-In-Place Detectable Warning Surface Panels (CIP) for at least 24 hours before 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 in to contact with the general public. Provide barricades or screens to protect pedestrians.

1.7 MANUFACTURER'S WARRANTY

A Cast-In-Place Detectable Warning Surface Panels (CIP) shall be guaranteed in writing for a period of seven (7) years from date of Contract's final completion. The guarantee includes manufacturing defects, breakage, and deformation.

1.8 INSTALLATION WARRANTY

A Cast-In-Place Detectable Warning Surface Panels (CIP) installation shall be warranted in writing for two (2) years by the installer. Products must be guaranteed from defective work and loosening of panels.

SECTION 2 – PRODUCTS

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2.1 MANUFACTURERS

A. Cast-In-Place Paver, Detectable Warning Surface Panels (CIP) by ADA Solutions, 323 Andover Street, Suite 3, Wilmington, MA 01887. Toll-Free: 800-372-0519, sales@adatile.com, www.adatile.com.

B. Panel Sizes

1. Dome Spacing of 2.35” (59.6 mm) to 2.40” (60.96 mm):

a. 24” x 36” (609.6 x 914.4 mm)
b. 24” x 48” (609.6 x 1219.2 mm)
c. 24” x 60” (609.6 x 1524.0 mm)
d. 36” x 48” (914.4 x 1219.2 mm)
e. 36” x 60” (914.4 x 1524.0 mm)

2. Dome Spacing of 1.67” (40.6 mm):

a. 24” x 36” (609.6 x 914.4 mm)
b. 24” x 48” (609.6 x 1219.2 mm)
c. 24” x 60” (609.6 x 1524.0 mm)
d. 36” x 48” (914.4 x 1219.2 mm)
e. 36” x 60” (914.4 x 1524.0 mm)

C. Existing engineered and field-tested products, which have been in successful service for five (5) years are subject to specification compliance, may be incorporated in the project and shall meet or exceed the specified test criteria and characteristics. Requests for Approved Equal status must be submitted and approved by the Owner before the Tender Phase of the project.

2.2 MATERIALS

A. Composition: Cast-In-Place Detectable Warning Surface Panels (CIP) shall be manufactured using a matte finish exterior grade homogeneous (uniform color throughout thickness of product) glass and carbon reinforced polyester based Sheet Molding Compound (SMC) composite material. Truncated domes must contain fiberglass reinforcement within the truncated dome for superior structural integrity and impact resistance. A matte finish will be required on the Tactile Warning Surface for superior slip resistance performance superior to that offered by a gloss finish. Use of Tactile Warning Surface Products employing coatings or featuring layers of material with differing composition, performance, or color properties is expressly prohibited under this Section.

B. Color: Color shall be single, homogeneous color throughout panel

1. Federal Yellow (Y), Federal Standard Color No. 33538
2. Brick Red (R), Federal Standard Color No. 20109
3. Clay Red (CR) Federal Standard Color No. 22144
4. Safety Red (SR) Federal Standard No. 31350
5. Black (B) Federal Standard Color No. 37038
6. Dark Gray (G) Federal Standard Color No. 36118
7. Safety Blue (B) Federal Standard Color No. 15187
8. White (W) Federal Standard Color No 27925
9. Seattle Yellow (SY) Federal Standard Color No. 23594

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C. Domes: Square grid pattern of raised truncated domes of 0.2" (5 mm) nominal height, base diameter of 0.9" (22.8 mm) and top diameter of 0.45" (11.4 mm). ADA Standards and Public Rights-of-Way Accessibility Guidelines require truncated dome spacing range of 1.6"-2.4" (40.6-60.9 mm).
[Designer Note: For superior wheelchair, walker and shopping cart mobility, the preferred truncated dome spacing shall have a center-to-center (horizontally and vertically) spacing of nominal 2.35" (59.6 mm), measured between the most adjacent domes on square grid.]

D. Configuration: CIP panels sizes shall be as indicated on the Contract Drawings. For superior load bearing capacity, CIP panels shall feature internal embedment ribs at 3" (76.2 mm) on center maximum. The field area shall consist of a non-slip textured surface.

E. Truncated Dome Surface of CIP panels shall be protected with factory installed plastic sheeting for cleanliness during the installation process. Basic Installation Guidelines shall be printed on the plastic sheeting in both English and Spanish for customer convenience.

F. Cleaning materials used on site shall have code acceptable low VOC solvent content and low flammability.

G. The Specifications of the concrete, sealants and related materials shall be in accordance with the Contract Documents and the guidelines set by their respective manufacturers.

SECTION 3 - EXECUTION

3.1 PREPARATION

A. During all concrete pouring and panel installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.

B. 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 panel. An overly wet mix will cause the panel to float. Under these conditions, suitable weights such as 2 concrete blocks or sandbags (25 pounds) shall be placed on each panel.

C. The concrete shall be poured and finished, true and smooth to the required dimensions and slope prior to 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, vibrator, rubber mallet with 2" x 4" x 10" (51 mm x 102 mm x 254 mm) wood tamping plate, and a device for cutting the Detectable Warning Surface Panels.

3.3 INSTALLATION

A. Contractor will not be allowed to install CIP 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.

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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. CIP panels shall be tamped or vibrated into the fresh concrete to ensure that there are no voids or air pockets, and the field level of the panel is flush to the adjacent concrete surface or as the Drawings indicate to permit proper water drainage and eliminate tripping hazards between adjacent finishes.

E. Cutting and Setting of CIP panels shall be cut into size and configuration indicated on the Drawings using a 60 tooth carbide blade on a table saw or equivalent cutting device. Minimize any cantilever effect (to the maximum extent practicable) when cutting between successive embedment ribs as concrete will tend to flow up and over the panels.
F. The top of the body of the panel shall be fully seated and flush with the adjacent concrete substrate. For specific instructions for cutting and setting refer to Detectable Warning Surface manufacturer's written instructions.

3.4 CLEANING AND PROTECTING

A. Protect CIP panels against damage during construction period to comply with panel manufacturer's Specifications.

B. During and after the CIP panel installation and the concrete curing stage, it is imperative that there are no walking, leaning or external forces placed on the panel to rock the panel, causing a void between the underside of the panel and the concrete.

C. Remove Protective Plastic Sheeting from CIP panel within 24 hours of installation of the panel. Particularly under hot weather conditions (80 degrees or higher), plastic sheeting will adhere strongly (resulting in difficult removal of same) to Detectable Warning Surface panel when not removed quickly.

D. If requested by the Project Manager, clean CIP 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 (Updated 07/25/2022)

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