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SECTION 32 17 26 – TACTILE WARNING SURFACING

DETECTABLE WARNING SURFACE
IRON DOME® & IRON DOME® SECURE FLANGE CAST IRON PLATES

SECTION 1 – GENERAL

1.1 DESCRIPTION

A. This Section includes Specifications for furnishing and installing embedded Cast Iron Detectable Warning Surface Plates 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 DOCUMENTS

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, Ohio

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 plate samples. Samples shall be properly labeled and shall contain the following information: Name of Project, Submitted By, Date of Submittal, and Manufacturer's Name.

C. Shop Drawings: Submit the Standard Manufacturer Shop Drawings showing all pertinent characteristics of the Cast Iron Detectable Warning Surface Plates including profile, plate surface profile, plans of plate 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 plates and accessories as required.

1.4 QUALITY ASSURANCE

A. Provide Cast Iron Detectable Warning Surface Plates and accessories as produced by a single manufacturer with a minimum of five years of experience in manufacturing Cast-In-Place Detectable Warning Surface Products.

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

C. Cast Iron Detectable Warning Surface Plates 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 Iron Detectable Warning Surface Plates shall meet or exceed the following test criteria using the most current test methods:

Standard	**Standard Description**	**Value**
ASTM C 1028	Standard Test Method for Determining the Static Coefficient of Friction (Slip Resistance)	0.93 Dry, 0.91 Wet
ASTM A 48	Standard Specification for Gray Iron Castings	Complies Class 30B Gray Iron
ASTM A 159	Standard Specification for Automotive Gray Iron Castings	Complies
ASTM D 638	Tensile Strength	36,000 psi
AASHTO M105	Standard Specification for Gray Iron Castings	Complies Class 30B Gray Iron
ASTM D5420	Standard Test Method for Impact Resistance of by Means of a Striker Impacted by a Falling Weight (Gardner Impact)	600 in-lbs minimum
FM 5-594	Florida Method - Test for Wear Resistance of Surface Applied Detectable Warning Surfaces	0.00189 g/cm^3

E. Gray Iron Casting compliant with ASTM A 159 (G3000), ASTM A 48-03, and AASHTO M105-09 (Grade 30B).

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

G. Plate body must meet or exceed 0.20" (6.35 mm) thickness (not including truncated domes).

H. Dimensions: Cast Iron Detectable Warning Surface Plates shall be held within the following nominal dimensions:

Part Number	Part Size	Part Weight
CI1224	Rectangular Plate 12" x 24" (305 mm x 610 mm)	20.50 lbs. (9.3 kg)
CI2424 SF	Rectangular Plate 24" x 24" (610 mm x 610 mm)	36.00 lbs. (16.32 kg)
CI2430 SF	Rectangular Plate 24" x 30" (610 mm x 762 mm)	43.35 lbs. (19.66 kg)
CI_15	15' Radial Wedge Plate 24" x 5" (610 mm x 127 mm)	5.50 lbs. (2.49 kg)
CI_20	20' Radial Wedge Plate 24" x 4" (610 mm x 101 mm)	5.50 lbs. (2.49 kg)
CI_25	25' Radial Wedge Plate 24" x 4" (610 mm x 101 mm)	6.00 lbs. (2.72 kg)
CI_30	30' Radial Wedge Plate 24" x 4" (610 mm x 101 mm)	6.00 lbs. (2.72 kg)

I. Plates are installed in their natural patina state unless specified otherwise.

1.5 DELIVERY, STORAGE AND HANDLING

A. Cast Iron Detectable Warning Surface Plates 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 plate from concrete residue during installation.

B. Cast Iron Detectable Warning Surface Plates shall be delivered to a location at the building site for storage before installation. Store plates in an area so that the plates are maintained in a clean, dry condition to prevent contamination or damage to the plates.

1.6 SITE CONDITIONS

A. Environmental Conditions and Protection: Maintain a minimum temperature of 40°F (4°C) in spaces to receive Cast Iron Detectable Warning Surface Plates 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 Iron Detectable Warning Surface Plates shall be guaranteed in writing for a period of 15 (fifteen) years from date of Contract's final completion. The guarantee includes manufacturing defects, breakage, and deformation.

1.8 INSTALLATION WARRANTY

A. Cast Iron Detectable Warning Surface Plates installation shall be warranted in writing for two (2) years by the installer. Products must be guaranteed from defective work and loosening of plates.

SECTION 2 – PRODUCTS

2.1 MANUFACTURERS

A. Cast Iron Detectable Warning Surface Plates by ADA Solutions, 323 Andover Street, Suite 3, Wilmington, MA 01887. Toll-Free: 800-372-0519, sales@adatile.com, www.adatile.com.

1. Product: **IRON DOME®** and **IRON DOME® SF** Cast Iron Plates

B. Plate Sizes (nominal)

1. Standard Rectangular Plates

a. 12” x 24” (304.8 x 609.6 mm) with zinc alloy embedment anchors
b. 24” x 24” (609.6 x 609.6 mm) with **Secure Flange** embedment features
c. 24” x 30” (609.6 x 762 mm) with **Secure Flange** embedment features

2. Radius Wedge Plates (to be used in conjunction with rectangular plates). Various combinations of rectangular plates and radius wedges installed together to create installations with outer radius from 9 feet (2.74 m) minimum to 150 feet (45.7 m)

a. R15 Wedge 24” x 5” (609.6 x 127 mm) with zinc allow embedment anchors
b. R20 Wedge 24” x 4” (609.6 x 101.6) with zinc allow embedment anchors
c. R25 Wedge 24” x 4” (609.6 x 101.6) with zinc allow embedment anchors
d. R30 Wedge 24” x 4” (609.6 x 101.6) with zinc allow embedment anchors

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.

D. Color: standard finish shall be natural rust patina. Painted finish available in the following colors:

Color	Color Standard	Color Description
Federal Yellow (Y)	Federal Standard 595B Table IV	Color No. 33538
Brick Red (R)	Federal Standard 595B Table IV	Color No. 20109
Clay Red (CR)	Federal Standard 595B Table IV	Color No. 22144
Black (B)	Federal Standard 595B Table IV	Color No. 37038

E. Domes: Raised truncated domes of 0.2” (5.0 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.]

F. Dome Spacing:

1. Standard Rectangular Plates: 2.4” (60.9 mm) dome spacing in square grid pattern
2. Radius Wedge Plates: 1.67” to 2.4” (40.6-60.9 mm) dome spacing in radial pattern

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 detectable warning plate installation procedures, ensure adequate safety guidelines are in place and that they comply with the applicable industry and government standards.

B. Before installation, Contractor to ensure all submittals have been reviewed and approved by the contract Engineer/Architect. Detectable warning plates shall be installed as per manufacturer’s instructions.

C. Before placement of the detectable warning plates, review manufacturer’s instructions and contract drawings with the Contractor before the construction and refer all discrepancies to Project Engineer/Manager.

D. The physical characteristics of the concrete shall be consistent with the Contract Specifications while maintaining a slump range of 4” to 7” (102 mm to 178 mm) to permit solid placement of the detectable warning plates. An overly wet concrete mix may cause the plates to float. Under these conditions, suitable weights such as two (2) concrete blocks or sandbags 25 lb. (11.4 kg) shall be placed on each cast iron plate until the concrete sets.

E. The concrete shall be poured and finished, true and smooth using typical mason’s tools to the required dimensions and slope before detectable warning plate placement. Immediately after finishing, use a 4 ft (1.2 m) long level with electronic slope readout to level to the required specified slope is achieved. The plates shall be placed true and square to the curb edge, or by the contract drawings/specifications.

3.2 INSTALLATION

A. Maintain a 4” to 7” slump range, pour, and float the concrete and prepare for detectable warning plate installation.

B. Without removing any concrete, place plates on the curb ramp 6" to 8" from the curb line.

C. Tamp the plates in grid pattern across the top face, embedding the plates into the concrete using a rubber mallet or vibrate into place using a vibrating mechanism fixed with a soft base such as wood.

D. Create an edge around the perimeter of the detectable warning plates using a 3/8" radius edging tool then float the concrete around plate perimeter using a steel trowel.

E. Using a smart level, make sure ramp and plates maintain compliance with ADA requirements and in accordance with contract documents.

F. Apply a broom-finish to the curb ramp and ensure face of tile is clean and free of any concrete debris.

G. When preparing to set the detectable warning plates, it is important that no concrete be removed from the area to accept the plates. It is recommended that the installation technique eliminate any air voids under the plates. Air holes at anchor locations allow air to escape during the installation process.

H. Detectable warning plates shall be tamped, vibrated, and cast into place to provide an adequate bond between the back side of the plate and the wet concrete; this will ensure that the plate is flush to the adjacent concrete surface or as the drawings indicate to permit proper water drainage and eliminate tripping hazards between adjacent finishes. Care should be taken to avoid stepping on the plate while it is being set. Doing so will result in the possible unevenness of the plates, creating an air void(s) under the surface.

I. Radius wedge plates are recommended to accommodate most radius conditions. Radius wedge plates are to be installed between rectangular plates.

J. Immediately after placement, the detectable warning plate elevation is to be checked to adjacent concrete. The elevation and slope should be set consistent with contract drawings to permit water drainage to curb as the design dictates. Ensure that the field surface of the plate is flush with the surrounding concrete and back of curb so that no ponding is possible on the plate at the back side of the curb.

K. While concrete is workable, create a 0.25" (6.35 mm) concrete-free recess around the perimeter of the plates. Use a 0.75" (9.5 mm) radius edging tool to create a finished edge of the concrete. Then a steel trowel shall be used to finish the concrete around the perimeter of the plate flush to the field level.

L. During and after the detectable warning plate installation and the concrete curing stage, it is imperative that there is no walking, leaning, or external force placed on the plate that may rock the plate causing a void between the underside of plate and the concrete. Use proper safety barriers or cones to keep the pedestrians away.

M. Following detectable warning plate placement, review installation tolerances to contract drawings and adjust plate before the concrete sets. Suitable weights of 25 lb. (11 kg) each may be required to be placed on each plate as necessary to ensure solid contact with the underside of the plate to concrete.

3.3 CLEANING AND PROTECTING

A. Protect detectable warning plates against damage during the construction period to comply with manufacturer's specifications.

B. Protect plates against damage from rolling loads following installation by covering with plywood or hardwood.

C. Replace plates by the method specified by ADA Solutions.

D. If requested by the Project Manager, clean detectable warning plates not more than four (4) days before the date scheduled for inspection intended to establish the date of substantial completion in each area of the project. Clean the plates by the method specified by ADA Solutions.

E. Comply with ADA Solutions maintenance manual for cleaning and maintaining plate surface. It is recommended to perform annual inspections for safety and plate integrity.

END OF SECTION (Updated 02/01/2024)