

STAGGERED DOME SURFACE APPLIED TACTILE / DETECTABLE WARNING SURFACE TILES
(For Transit Use)

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This Section includes Specifications for furnishing and installing Staggered Dome Surface Applied Tactile / Detectable Warning Surface Tiles (SDSA) with a staggered truncated dome pattern on all curb ramps, platform edges and walking surfaces at the locations and to the dimensions shown on the Contract Drawings as directed by the Engineer. (Surface Applied Tactile is also known as Retrofit Tactile Warning Tiles)

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specifications, apply to this Section.
- B. Americans with Disabilities Act (ADA) Title 49 CFR Transportation, Part 37.9 Standards for Accessible Transportation Facilities, Appendix A, Section 4.29.2 Detectable Warnings on Walking Surfaces. FHA Memo (5-06-02) titled Truncated Domes. Federal Register Volume 71, No. 209, 49 CFR Part 37 (10-30-06), ADA Standards for Transportation Facilities (11-29-06, DOT): Sections 406, 705, and 810. ADA Standards for Accessible Design – 2010 (9/05/11, DOJ), ADAAG: Sections 705 and 810. Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Rights of Way (7/23/11, Access Board), PROWAG: Sections R208, R304, R305, R308, and R309.
- C. American Society for Testing and Materials (ASTM) Test Methods B117, C501, C1028, D543, D570, D638, D695, D790, G151, G155, and E84.
- D. American Association of State Highway and Transportation Officials (AASHTO): Test Method AASHTO-H20.
- E. California Code of Regulations (CCR 2007) Title 24 Part 1 Articles 2, 3 and 4, and Part 2 Section 205 definition of “Detectable Warning”, Section 1127B.5 for “Curb Ramps”, and Section 1133B.8.5 for “Detectable Warnings at Hazardous Vehicle Areas”. California Department of Transportation Detectable Warning Surface Authorized Material List. Division of the State Architect IR 11B-3 (1/26/05) and IR 11B-4 (1/01/11). IR 11B-4 (1/01/11) removed the requirement for a “staggered” pattern and now calls for the “square grid” (in-line) pattern.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's literature describing products, installation procedures and maintenance instructions.
- B. Samples for Verification Purposes: Submit two (2) Tactile Warning Surface Samples minimum 8" x 8" of the kind proposed for use. Samples shall be properly labeled and shall contain the following information: Name of Project, Submitted by, Date of Submittal, Manufacturer's Name, and Catalog Number.
- C. Shop Drawings: Submit Standard Manufacturer Shop Drawings showing all pertinent characteristics of the Staggered Dome Surface Applied Tactile Warning Tile (SDSA) including profile, sound on cane contact amplification feature, fastener locations and installation methods.
- D. Material Test Reports: Submit current test reports from qualified, accredited independent testing laboratory in accordance with ASTM guidelines and indicating that materials proposed for use are in compliance with specification requirements and meet the properties indicated. All test reports submitted shall be representative of the Staggered Dome Surface Applied Tactile Warning Tile (SDSA) delivered to the Project.
- E. Maintenance Instructions: Submit copies of manufacturer's specified maintenance practices for each type of Tactile Warning Surface Tile and accessory.

1.04 QUALITY ASSURANCE

- A. Provide composite Staggered Dome Surface Applied Tactile Warning Tiles (SDSA) and accessories as produced by a single manufacturer with a minimum of five years experience in manufacturing Staggered Dome Surface Applied Tactile Warning Tiles (SDSA).
- B. Installer's Qualifications: Engage an experienced installer certified in writing by the Tactile Warning Surface manufacturer, who has successfully completed Tactile Warning Surface installations similar in material, design, and extent to that indicated for the Contract.
- C. Staggered Dome Surface Applied Tactile Warning Tiles (SDSA) must be compliant with ADAAG, PROWAG, and California Title 24 requirements. Division of the State Architect IR 11B-3 (1/26/05) and IR 11B-4 (1/01/11). IR 11B-4 (1/01/11) removed the requirement for a "staggered" pattern and now calls for the "square grid" (in-line) pattern.
- D. Staggered Dome Surface Applied Tactile Warning Tiles (SDSA) shall meet or exceed the following test criteria using the most current test methods:
 - 1. Compressive Strength: 28,000 psi minimum, when tested in accordance with ASTM D695.

2. Flexural Strength: 29,000 psi minimum, when tested in accordance with ASTM D790.
3. Water Absorption: Not to exceed 0.10%, when tested in accordance with ASTM-D570.
4. Slip Resistance: 1.00 minimum wet/dry static coefficient of friction when tested in accordance with ASTM C1028.
5. Flame Spread: 25 maximum, when tested in accordance with ASTM E84.
6. Salt and Spray Performance of Tactile Warning Surface: No deterioration or other defects after 200 hours of exposure, when tested in accordance with ASTM-B117.
7. Chemical Stain Resistance: No reaction to 1% hydrochloric acid, motor oil, calcium chloride, gum, soap solution, bleach, and antifreeze, when tested in accordance with ASTM D543.
8. Abrasion Resistance: 500 minimum, when tested in accordance with ASTM C501.
9. Accelerated Weathering of Tactile Warning Surface when tested by ASTM-G155 or ASTM G151 shall exhibit the following result: $\Delta E < 5.0$ at 2,000 hours minimum exposure.
10. Tensile Strength: 11,000 psi minimum, when tested in accordance with ASTM D638.
11. AASHTO-H20 Load Bearing Test: No Damage at 16,000# loading.
12. Freeze/Thaw/Heat: No deterioration when tested in accordance with ASTM C 1026.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Staggered Dome Surface Applied Tactile Warning Tiles (SDSA) shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings.
- B. Storage Facility
 1. Store SDSA Tiles in an area that is within an acceptable temperature range (40-90 degrees). In particular, protect sealants from freezing.
 2. Maintain Storage Facility in a clean dry condition to prevent contamination or damage to SDSA Tiles and incidentals.

1.06 GUARANTEE

- A. SDSA Tiles shall be guaranteed in writing for a period of five (5) years from date of Contract's final completion. The guarantee includes manufacturing defects, breakage, and deformation.

PART 2 – PRODUCTS

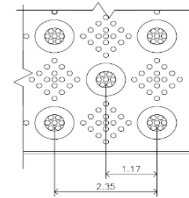
2.01 MATERIALS

A. Composition: SDSA Tiles 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 homogeneous throughout SDSA Tile.

1. Federal Yellow (Y) per Federal Standard 595B Table IV, Color No. 33538.
2. Brick Red (R) per Federal Standard 595B Table IV, Color No. 20109.
3. Clay Red (CR) per Federal Standard 595B Table IV, Color No. 22144.
4. Safety Red (SR) per Federal Standard 595B, Table IV, Color No. 31350.
5. Black (B) per Federal Standard 595B Table IV, Color No. 37038.
6. Dark Gray (G) per Federal Standard 595B Table IV, Color No. 36118.
7. Safety Blue (B) per Federal Standard 595B Table IV, Color No. 15187.
8. White (W) per Federal Standard 595B Table IV, Color No 37925.
9. Seattle Yellow (SY) per Federal Standard 595B Table IV, Color No. 23594.
10. Houston Beige (Pantone #7529C).

C. Staggered Dome Pattern: The truncated dome shall measure a nominal 0.45" diameter at the top of the truncated dome, 0.90" diameter at the base of the truncated dome, 0.20" high, and 2.35" on center, staggered pattern. (see drawing)



D. Configuration: SDSA Tile sizes shall be as indicated on the Contract Drawings. The field area shall consist of a non-slip textured surface with a minimum static coefficient of friction of 0.80, wet and dry. At a minimum, the thickness of the body of SDSA Tile shall measure 0.1875" (nominal).

E. Available Configurations of the SDSA Tiles:

1. SDSA - Butt Joint, Staggered Truncated Domes:
 - i. Size: 2' x 4' x 3/16" thick (nominal) with a half inch deep flange along both 4 foot sides.
 - ii. The Perimeter of the Standard Panel features a chamfer (no 90 degree return).

- iii. Dome Spacing: staggered dome pattern (see above drawing)
 - iv. The Standard Panel includes a minimum of 14 integrally molded holes for the fasteners.
 - v. As a custom order, Tactile Warning Surface Panel may be manufactured in a ¼" and 3/8" thickness.

- F. Follow Tactile Warning Surface Manufacturer's installation procedures.
 - 1. Transit ChemLink M1 Data Sheet: <http://www.adatile.com/transit.php>

- G. Fasteners: The Tactile Warning Surface Tile shall have 14 countersunk fastening holes. Color matched, stainless steel 304, flat head drive anchor: ¼" diameter x 1 1/2" long.

- H. Adhesive:
 - 1. Polyether Structural Adhesive/Sealant by Chem Link (M-1)
 - 2. Urethane Elastomeric Adhesive by Bostik (Hydroment Ultra-Set Advanced or Durabond D-818)
 - 3. Approved equal.

- I. Sealants:
 - 1. Single Component Urethane Sealant:
 - i. Sources: BASF NP1 by BASF Building Systems or Sikaflex 1A by Sika Corp.
 - ii. Colors: Black, Limestone, Redwood Tan
 - 2. Polyether Structural Adhesive/Sealant by Chem Link (M-1)
 - i. Colors: Black, Gray, Limestone, White
 - 3. Approved Equal

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

- K. 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.

2.02 MANUFACTURERS

- A. Available manufacturers, subject to compliance with these Specifications include, but are not limited to, the following:
 - 1. ADA Solutions Inc. of Chelmsford, MA (Phone: 800-372-0519, Fax: 978-262-9125, Web Site: www.adatile.com , E: info@adatile.com), or approved equal.
 - 2. Requests for Approved Equal Status must be submitted and approved by the Owner during the Bid Phase of the Project.

2.03 EQUIPMENT

- A. Contractor shall provide all tools, equipment and services required for satisfactory installation per the Tactile Warning Surface Product manufacturer's instruction.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Transmit submittals and deliverables required by this Section.
- B. Furnish products as indicated.
- C. Substrate Condition: Ensure substrate is in suitable condition, and in compliance with the Tactile Warning Surface manufacturer recommendations, to receive work of this Section. Prior to construction, refer any and all discrepancies to the Engineer for further action.
- D. See Transit Surface Applied Installation Guidelines to properly prepare area for installation: <http://www.adatale.com/transit.php>.

3.02 INSTALLATION

- A. Contractor will not be allowed to install SDSA until all submittals have been reviewed and approved by the Engineer.
- B. SDSA Tile shall be installed per manufacturer's instructions.
<http://www.adatale.com/transit.php>
- C. To the maximum extent possible, the SDSA Tiles shall be oriented such that the rows of staggered truncated domes are parallel with the direction of the ramp. When multiple SDSA Tiles regardless of size are used, the truncated domes shall be aligned between the tactile warning surface Tiles and throughout the entire tactile warning surface installation.
- D. Cutting of SDSA Tiles may be required to accommodate specific site conditions. All possible attempts shall be made to minimize cutting of the SDSA Tiles. Minimum acceptable width of the cut SDSA Tile shall be 9".
- E. Environmental Conditions: Air and substrate temperatures must exceed 40 degrees for at least 8 daytime hours for a sound and proper installation. A "weed torch" may be used to boost the substrate temperature to expedite cure of adhesives and sealants.
- F. Immediately prior to installing the SDSA Tiles, the concrete surfaces must be inspected to ensure that they are clean, dry, free of voids, curing compounds, projections, loose material, dust, oil, grease, sealers and determined to be structurally sound with a minimum four (4) day concrete cure period (unless otherwise directed by the SDSA Tile manufacturer) and that the surface is flat. As necessary, substrate may be mechanically cleaned with a diamond cup grinder or shot blaster to remove any dirt or foreign material although a broom or leaf blower is usually adequate for cleaning of the substrate.

- G. Apply adhesive in accordance to adhesive manufacturer instructions or as shown on the ADA Solutions Chemlink M1 Data Sheet. <http://www.adatile.com/transit.php>
- H. On Continuous Runs:
Set the SDSA Tile(s) true and square to the curb ramp areas as detailed in the Drawings. Allow 1/8" separation between successive SDSA Tiles for expansion/contraction.
- I. Drill holes true and straight to a depth of 2 1/2" by 1/4" using the recommended bit. As necessary, additional countersunk holes may be added to the SDSA Tile by using a 5 point 1/2" (82 degree) countersink to create the necessary holes.
- J. Mechanically fasten SDSA Tile to the concrete substrate using a 32oz. to 48oz. hammer to set the composite sleeve anchors. Ensure that the fastener has been set to full depth, straight and true. Care should be taken when setting the fastener to avoid any advertent blows with the hammer to the SDSA Tile.
- K. Following the installation of the SDSA Tile, the sealant system should be applied to the perimeter edge. Follow the Tactile Warning Surface manufacturer's recommendations when applying the sealant in a cove type profile to blend and seal the SDSA Tile edge to the adjoining surfaces.
- L. Do not allow foot traffic on installed SDSA Tile until the perimeter edge sealant has cured sufficiently to avoid tracking. If the SDSA Tile must be placed into immediate pedestrian service, apply baby powder to the sealant to minimize the possibility of tracking while the sealant cures. Foot imprints may appear in the fully cured sealant application

3.03 CLEANING AND PROTECTING

- A. Protect SDSA Tiles against damage during construction period to comply with SDSA Tiles manufacturer's Specifications.
- B. As necessary, while the Project remains under construction, protect SDSA Tiles against damage from rolling loads following installation by covering with plywood or hardwood.
- C. If requested by the Project Manager, clean SDSA Tiles 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 SDSA Tile by method specified by Tactile Warning Surface Products manufacturer.

END OF SECTION
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