**PART 1 - GENERAL**

* 1. **SUMMARY**
     1. Work Includes: Exterior tile warning surfaces at traffic walks; also denoted on drawings as truncated dome pavers, tiles or other industry standard nomenclature.
     2. Related Work:
        1. Requirements in Addenda, Alternates, Conditions, and Division 1 collectively apply to this work.
        2. Portland Cement Concrete Paving: Section 32 13 14.
  2. **SUBSTITUTIONS**

Only written approval of the Architect, by Addenda or Change Order, will permit substitutions for materials specified; in accordance with Article, Title 24, Part 2, CBSC, Section 01 25 13 Product Options and Substitutions.

* 1. **QUALITY ASSURANCE**
     1. Standards: In general, Work shall conform to latest edition of the following standards as applicable, and as modified herein.
        1. Installation: Tile Council of America, Handbook for Ceramic Tile Installation.
     2. Product shall comply with current California Building Standards Commission, Title 24, Part 12 CBSC, Chapters 12-11A and 12-11B, "Building and Facility Access Specifications".
     3. Warranty: Five (5) year warranty from the manufacturer stating that detectable warning products and directional surfaces shall ensure consistency and uniformity of the following:
        1. Shape
        2. Color Fastness
        3. Conformation
        4. Sound-on-cane acoustic equality
        5. Resilience
        6. Attachment will not degrade significantly for at least 5 years. Significant degradation shall mean that the product maintains at least 90% of its approved design characteristics.
     4. Detectable warning surfaces shall comply with CBC Section 11B-705.1.
     5. Detectable warning surfaces at transit boarding platform edges, bus stop, hazardous vehicular areas, reflecting pools and track crossings shall be yellow and approximate FS 33538 of Federal Standard 595C. Detectable surfaces at other locations shall be either the aforementioned yellow or a color providing a 70 percent minimum visual contrast with that of adjacent walking surfaces.

The material used to provide visual contrast shall be an integral part of the surface. CBC Section 11B-705.1.1.3.

* + 1. Detectable warning surfaces shall differ from adjoining surfaces in saliency or sound-on-cane contact. Such constraint shall not be required for detectable warning surfaces at curb ramps, islands or cut-through medians. CBC Section 11B-7051.1.4.
  1. **SUBMITTALS**
     1. Samples in duplicate: Manufacturer's standard color range.
     2. Warranties: Manufacturer's standard warranty (5 year warranty). See requirements under 1.03, Quality Assurance of this Section.
     3. Manufacturers: Recommended installation instructions.
     4. Shop Drawings: Showing plans of tile placement including joints for each installation location, type used.
     5. Material: Test reports.
     6. Maintenance Instructions.
  2. **DELIVERY, STORAGE AND HANDLING**

Deliver tile to Site in sealed containers with grade seals intact. Store materials in a dry location.

* 1. **PROJECT CONDITIONS**
     1. Coordinate this work with work and backing furnished under other Specifications Sections.
     2. Placement of tactile surfaces shall coincide with concrete curb ramps and concrete paving leading to a vehicular traffic lane pedestrian crossing.

**PART 2 - PRODUCTS**

* 1. **MATERIALS**
     1. Tile: Conform to Americans with Disabilities Act and CBC Section 11B-705 (Part 2, Title 24), latest edition. Tile to be standard grade; manufactured by Wausau Tile, Inc., Wausau, WI; 800-388-8728, or approved equivalent.
        1. Other Acceptable Manufacturers:
           1. ADA Solutions Inc.; 800-372-0519.
     2. Materials:
        1. Tile Size:
           1. Nominal: 12" square. b. Actual: 11-13/16"
        2. Thickness: 2-3/4"
        3. Weight: 24 to 32-1/2 lbs./sq. ft.
        4. Dimensional Tolerance: +/- 1/16" (length, width, height, convex, and concave).
        5. Color: As selected by Architect from manufacturer's full range of colors and patterns.
        6. Pattern: ADA-2 Truncated Dome, 5 domes each side of tile.
           1. Spacing: 2.3" to 2.4" nominal center of domes in both directions.
           2. Dome diameter to be 0.9" to 0.92" at base and 0.45" to 0.47" at top of dome.
           3. Height of dome: 0.18" to 0.22"
        7. Minimum physical properties of the detectable/tactile surfaces:
           1. Compressive Strength - ASTM C140/C140M-13 equal to or greater than 8,000 psi.
           2. Flexural Strength - ASTM C293/C293M-10 equal to or greater than 800 psi average.
           3. Water Absorption - ASTM C140/C140M-13a less than 6%.
           4. Freeze/Thaw: ASTM C67-13 equal or less than 1% loss of dry weight (50 cycles)
           5. Center Load: WTCL99 = 1,850 pounds
           6. Warranty: See 1.03 B and C of this section.
     3. Setting Bed (for thick mortar method):
        1. 8" to 12" compacted road grade gravel (#6), sub-base.
        2. 6" to 8" concrete base.
        3. 1-1/4" thick latex mortar bed with 2" x 2" - 16/16 welded galvanized wire mesh reinforcing per manufacturer's requirements.
        4. Portland cement mortar mix: ASTM C150/C150M-12, Laticrete 226, thick bed mortar with #3701 Admix, or manufacturer approved equivalent.
        5. Slurry Bond Coats: Laticrete International 4237 bond coat or approved equivalent per manufacturer's approved recommendations. Provide slurry bond coat beneath and above mortar bed. A 100% bond between tile and setting bed is required. To achieve this, the "back butter" method and a 3/8" x 1/2" notched trowel shall be used per manufacturer's instructions.
        6. Grout: All joints shall be grouted using a latex or acrylic admixture for waterproofing. The use recommendations of the admixture manufacturer must be followed.
        7. Cementitious Materials:
           1. Portland cement conforming to ASTM C150/C150M-12 for Portland cement.
           2. Aggregates conforming to ASTM C33/C33M-13 for normal weight concrete aggregate.

**PART 3 - EXECUTION**

* 1. **EXAMINATION**
     1. Examine newly poured concrete surfaces scheduled to receive tactile tile work. Report any unsatisfactory conditions.
     2. Do not start work until unsatisfactory conditions are corrected. Starting work constitutes acceptance of surfaces. Refer to manufacturer's recommendations.
  2. **INSTALLATION** - GENERAL
     1. Tile Placement: By skilled mechanics and in accordance with the applicable provisions of the manufacturer's installation recommendations for cast-in- place tiles.
     2. Install Portland Cement paving in accordance with Section 32 13 14 Portland Cement Concrete Paving.
     3. Place tiles and set per manufacturer's recommendations in a single plane, 1:12 maximum slope, flush with surrounding paved surfaces. The tile shall have a 2' minimum dimension in the direction of travel perpendicular to the traffic lane being crossed. Arrange tile pattern to allow in-line approach by wheelchairs.
     4. Tiles shall be placed after poured concrete ramp/walk mix is placed and screeded to the desired slope.
     5. Work tiles into concrete mix to the desired level flush with adjacent surfaces before finishing adjacent surfaces. Place 2 each 25 lb weights on each tile to ensure solid contact with concrete on the underside of the tile.
  3. **CLEANING**
     1. Protection: Protect finish and surface of tile and adjacent materials with Vaseline to prevent staining.
     2. Cleaning: Upon completion of any portion of tile work, remove rubbish and unused materials incidental to the installation, and give the finished surfaces a thorough cleaning in a manufacturer-approved manner. Remove traces of cement and dust accumulations. Do not use acid solutions on tactile tile work.

END OF SECTION