

**CITY OF COLUMBUS
PUBLIC SERVICE DEPARTMENT
TRANSPORTATION DIVISION**

**SUPPLEMENTAL SPECIFICATION 1551
DETECTABLE WARNINGS**

March 1, 2004

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1551.01 Description.

This work shall consist of furnishing all material, equipment, and labor necessary for the placement of detectable warning devices at curb ramps or other walking surfaces, complete and ready for service at locations shown on the plans. All work shall be in accordance with City of Columbus Standard Drawing 2319 Dr. A and with Section 1108 of the Architectural and Transportation Barriers Compliance Board's "Draft Guidelines For Accessible Public Rights-of-Way", dated June 17, 2002 as amended, supplemented and adopted.

1551.02 Materials.

All products shall receive prior approval by the City Engineer and be included in the City of Columbus, Transportation Division current listing of approved Producers and Products for detectable warning surfaces. New Products shall be submitted for review and approval in accordance with the City's General Policy and Procedures for New Products, Materials, and Construction Procedures.

Detectable warning surfaces shall be textured to provide slip resistance and shall contrast visually with adjacent walking surfaces – either light-on-dark, or dark-on-light. The preferred color for a light background shall be brick red. The preferred color for a dark background shall be safety yellow or light granite. Other colors may be specified or approved by the City Engineer provided that samples are submitted to and approved by the City Engineer at least three (3) working days prior to installation. Color submittals shall include manufacturer's statement of percentage of visual contrast provided according to ADAAG A4.29.2. Color shall be

integral with the detectable warning device and shall not be surface applied. Paints or other surface coatings shall not be used.

Detectable warning surfaces shall be classified by type of material and/or application method:

Type "A" – Pre-Cast, Manufactured Clay and Concrete Pavers - ***Approved for new construction, only.***

Type "B" – Surface-Applied or Surface-Formed Domes – Generally includes truncated domes bonded to the surface of existing curb ramps - ***Approved for retrofit, only.***

Type "C" – Stamped, Color Dyed Concrete - ***Approved for new construction, only.***

Type "D" – Surface-Mounted, Thin Tile and Thin Molded Sheet Goods – Generally includes tiles or mats (rigid & flexible, with pre-formed truncated domes), bonded and/or anchored to the surface of existing curb ramps - ***Approved for retrofit, only.***

Type "E" – Pre-Manufactured, Wet-Set Products – Generally includes rigid products pressed into freshly formed concrete - ***Approved for new construction, only.***

1551.03 Dimensions.

Truncated domes in a detectable warning surface shall have a base diameter of 0.9 inches (23 mm) minimum to 1.4 inches (36 mm) maximum, a top diameter of 50% of the base diameter minimum to 65% of the base diameter maximum, and a height of 0.2 inches (5 mm).

Truncated domes in a detectable warning surface shall have a center-to-center spacing of 1.6 inches (41 mm) minimum and 2.4 inches (61 mm) maximum, and a base-to-base spacing of 0.65 inches (16 mm) minimum, measured between the most adjacent domes on a square grid.

Detectable warning surfaces shall extend 24 inches (610 mm) minimum in the direction of travel and the full width of the curb ramp, landing, or blended transition.

Pavers shall be laid so that the centers of domes align with a straightedge placed both perpendicular and parallel with the

direction of travel. Dome Alignment may not differ by more than 1/4-inch.

The detectable warning surface shall be located so that the edge nearest the curb line is 6 inches (150 mm) minimum and 8 inches (205 mm) maximum from the face of the curb line.

Domes shall be aligned on a square grid, aligned in rows parallel and perpendicular to the predominant direction of travel. Domes must not be skewed diagonally to the direction of travel.

1551.04 Application.

Detectable warning devices shall be installed in accordance with manufacturer's specifications, except as modified by this specification or as otherwise specified on the plans. The finished surface shall be uniformly profiled to match the adjoining surfaces without lips, obstructions and shall drain completely.

The contractor shall warrant the installed surface to last no less than five years without losing more than two percent of the truncated domes due to delaminating as a result of product failure, and shall further warrant the surface for a minimum of five years against fading, chipping, peeling, cracking, or loss of original shade due to sunlight, salt or exposure to weathering.

Special Application Notes: Type "A" – Pre-Cast, Manufactured Clay and Concrete Pavers:

- Pavers shall be laid on an unreinforced concrete base. Thickness of the base shall be the greater of 4-inches or the specified, nominal thickness of the curb ramp.
- Pavers shall be set into a 1/2-inch thick bed of freshly poured latex or epoxy -modified cement mortar.
- Pavers (exclusive of domes) shall be flush with the surrounding concrete. The surface shall not differ by more than 1/8-inch in height.
- Pavers shall be laid so that the centers of domes align with a straightedge placed both perpendicular and parallel with the direction of travel. Dome Alignment may not differ by more than 1/4-inch.
- Joints between pavers and surrounding concrete surface shall be mortared and shall not exceed 1/4-inch in width.

Mortared joints shall be flush with top surface and struck so as to give a smooth surface.

- Joint spacing between pavers shall be no greater than 5/32-inch and not less than 1/16-inch. Pavers shall not be directly touching each other unless they have spacing bars
- Joints between pavers shall be sand-filled. Sand shall be washed, non-plastic, well-graded angular material free from deleterious or foreign matter, with maximum particle size not larger than the specified joint spacing. Gradation shall conform to Item 703.02 fine aggregate for concrete. Sweep this material to fill the joints and water with a fine mist. Repeat as necessary to achieve a sand-filled joint. When requested by the Engineer, the Contractor shall submit gradation analysis of the proposed joint material performed in accordance with ASTM C-136.
- Pavers shall consist of full, completely formed domes and shall be crack-free.
- The face of all pavers shall be clean of cement and protected so as to avoid chipping during construction.
- A minimum of 6-inch horizontal edge restraint shall be provided around the full perimeter of the detectable warning pavers. The restraints shall consist of Class "C" cast in place concrete, (City of Columbus CMS item 499).

1551.05 Method of Measurement.

The number of detectable warning devices shall be the actual number individual surfaces furnished and in place, complete and accepted. This item shall be complete and include all work necessary to provide a complete and useable detectable warning device. This shall include but not be limited to: layout, saw-cutting, removals, concrete and cement base materials, bedding, surface preparation, surface sealant, and repair of adjoining areas disturbed by the installation of the detectable warning surface.

1551.06 Basis of Payment.

Unless specifically included under other items on the plans, payment for accepted quantities will be made at the contract unit price for:

| <u>Item</u> | <u>Unit</u> | <u>Description</u> |
|-------------|-------------|------------------------------|
| 1551 | Each | Detectable Warning, Type "A" |
| 1551 | Each | Detectable Warning, Type "B" |
| 1551 | Each | Detectable Warning, Type "C" |
| 1551 | Each | Detectable Warning, Type "D" |
| 1551 | Each | Detectable Warning, Type "E" |

Note:

Payment for Item 1551 shall include all costs of furnishing material, equipment, and labor necessary for the placement of detectable warning devices, and shall be in addition to any overlapping payments for square foot of sidewalk, and the "per-each" payment for forming and finishing the curb ramp.