



## ADA Detectable Warning Bulletin (02.17.06)

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### **SECTION I - INTRODUCTION**

The Department of Justice (DOJ) is the lead agency that oversees the Americans with Disabilities Act (ADA)(1990). The U.S. Access Board develops the minimum design standards for complying with the ADA. The Department of Transportation is a designated agency responsible for enforcing the standards and implementing regulations of the ADA's Title II (State and Local Government Services). The Federal Highway Administration (FHWA) is the enforcement authority for overseeing pedestrian discrimination issues under the Title II implementing regulations.

Detectable warnings are an Americans with Disabilities Act (ADA) requirement in the current Americans with Disabilities Act Accessibility Guidelines (ADAAG) for the use of detecting the boundary between the sidewalk and the street. The original requirement in ADAAG was suspended for a time to conduct further research. Research was conducted, and the suspension of the requirement was lifted on July 26, 2001, and are now required when constructing and altering curb ramps. Truncated domes are the only detectable warnings allowed by ADAAG. Grooves, exposed aggregate, and other designs intended for use as detectable warning are too similar to pavement textures, cracks and joints and are not considered equivalent facilitation. Truncated domes are a unique design and have proven to be the most detectable surface.

## SECTION II - HISTORY

Detectable warnings were required in 1991 by the Americans with Disabilities Act Accessible Guideline (ADAAG) (regulatory standards) for hazardous vehicular ways, transit platform edges, and curb ramps. A suspension was placed on requiring detectable warnings. The reason for the suspension was to conduct research on the performance of their detectability. The Department of Justice, as the lead agency that oversees the Americans with Disabilities Act continued the suspension through July 26, 2001, which allowed 10 years for conducting research. The research determined that other designs used in place of truncated domes such as grooves, striations, and exposed aggregate, were not detectable in the sidewalk and roadway environment because of the similarities to other surface textures and defects. Truncated domes have a unique design that can be detected underfoot and with a cane, and other surfaces are not considered ADA equivalent and therefore do not comply with the ADA requirements.

The Department of Justice had the option of allowing the suspension to expire on July 26, 2001 or to continue the suspension. They decided to let the suspension expire. Consequently, since July 26, 2001 detectable warnings are again required. FHWA is obligated to enforce the requirements, and state and local governments are required to apply the minimum design standards when constructing and altering pedestrian facilities, though we encourage higher than minimum standards where possible.

The original ADA design standard for truncated domes is found in ADAAG (4.29.2), but updated and new design recommendation for the dimension and placement of the domes on curb ramps have been made (**Refer to Exhibit A**). Both FHWA and the U.S. Access Board are encouraging the use of the new design over the original.

## SECTION III - SPECIFICATIONS

### A. Size

Detectable warnings shall be 24 inches [610 mm] in the direction of travel and extend the full width of the curb ramp or flush surface.

Research has confirmed that for people who are visually impaired, there is a high level of risk of inadvertent street entry associated with the presence of curb ramps, particularly those having slopes of 1:12 or less. It has been demonstrated that detectable warnings complying with existing ADAAG Section 4.29.2 are highly detectable by persons with visual impairments, and can provide an effective stop signal for persons who are blind or visually impaired which can be used to determine the end of the sidewalk and the beginning of the vehicular way. Research has also demonstrated that 24 inches of detectable warning material is sufficient to enable persons who are blind or visually impaired to stop on 90 percent of approaches.

## **B. Location**

The detectable warning shall be located so that the edge nearest the curb line or other potential hazard is 6 to 8 inches [150 to 205 mm] from the curb line or other potential hazard.

Placement of the detectable warnings a maximum of 6 to 8 inches back from the curb line gives some latitude in placement of the detectable warning. Where curbing is embedded at the sidewalk/street junction, this will not need to be replaced. In addition, allowing 6 to 8 inches of ramp (or curb) surface beyond the detectable warning will give pedestrians who are blind an additional stopping distance before they step into the street. It will also enable some persons having mobility impairments to make a smoother transition between the street and the curb ramp.

## **C. Dome size and spacing**

Truncated domes shall have a base diameter of 0.9 inches [23 mm] minimum to 1.4 inches [36 mm] maximum, a top diameter of 50% or 0.45inch [10 mm] to .9 inches [23 mm] at the top, a height of 0.2 inch [5 mm] and a center-to-center spacing of 1.6 inches [41 mm] to 2.4 inches [61 mm] measured along one side of a square arrangement. (**View Exhibit B for drawing that shows height, top and bottom dimensions of Stampcrete Style**). Drawing shows an overhead view of a truncated dome surface having the domes in a square pattern with parallel arrangement.

The size and spacing of the domes affect detectability by pedestrians who are blind. This specification is much more detailed than that in the current ADAAG, and offers much less latitude in dimensions and spacing. It ensures that the dome spacing is the maximum currently known to be consistent with high detectability. The bottom diameter measures 0.9-1.4 inches, and the top diameter varies widely. The diameter of the dome where it touches the sole of the shoe affects detectability, and the top diameter of 0.4 to 0.45 of an inch is the suggested, as based on current research.

## **D. Dome alignment**

Domes shall be aligned on a square grid in the predominant direction of travel to permit wheels to roll between domes. **Exhibit B** shows domes aligned in rows, **not** skewed diagonally. This specification ensures a greater degree of safety and negotiability for persons with mobility impairments. It requires square alignment, to give people using wheeled mobility aids the greatest chance of being able to avoid the truncated domes.

## **E. Visual Contrast**

There shall be a minimum of 70% contrast in light reflectance between the detectable warning and an adjoining surface. The material used to provide visual contrast shall be an integral part of the detectable warning surface. Refer to your local committee on visual contrast, as some suggest that a lesser level of contrast could be as effective and more economical to provide than a minimum 70%.

## **SECTION IV - APPLICATION**

Detectable warnings shall be provided at the locations as shown in **Exhibit C**. Where islands or medians are less than 48 inches wide, the detectable warning should extend across the full length of the cut through the island or median.

The detectable warning is a unique and standardized surface intended to function much like a stop sign to alert pedestrians who are blind or visually impaired to the presence of hazards in the line of travel. The truncated dome surface should not be used for wayfinding or directional information. The removal of curbs, which provided a clearly defined indication of the location of the edge of the street, has caused difficulty for individuals who are blind or visually impaired. The locations shown in **Exhibit C** are identified as being appropriate for the installation of detectable warnings.

## **SECTION V – ON SITE DETECTABLE WARNING**

### **A. ON-SITE FABRICATION OF TRUNCATED DOME SURFACES USING STAMPED CONCRETE**

Local concrete contractors use stamping tools to produce raised truncated domes on the surface of freshly poured concrete. These on-site procedures for producing truncated domes are an extension of an existing technology which is widely used to impart textures to concrete surfaces to resemble slate, brick, stone, and so forth. Concrete should be integrally colored, or have mineral pigments broadcast over the surface, or both. The stamping tool may be rigid or flexible, and made of rubber or polyurethane. This tool is pressed into the concrete surface with sufficient force to create the pattern of truncated domes. After the concrete surface has partially cured, a clear sealer is brushed on.

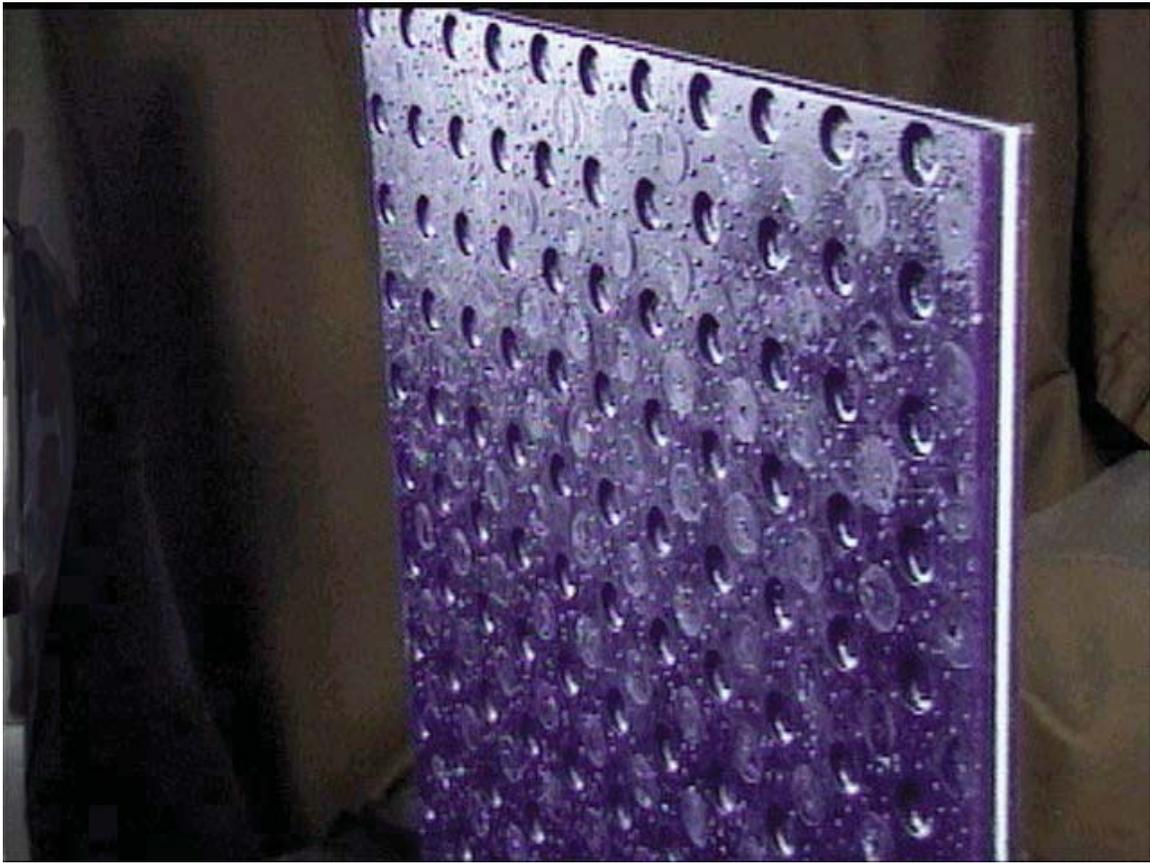
This three step fabrication in-place of concrete detectable warning includes:

Step 1) Pigment is mixed in concrete truck or sprinkled onto the wet concrete surface prior to stamping.

Step 2) Release agent is placed on surface and mold is pressed into the wet concrete.

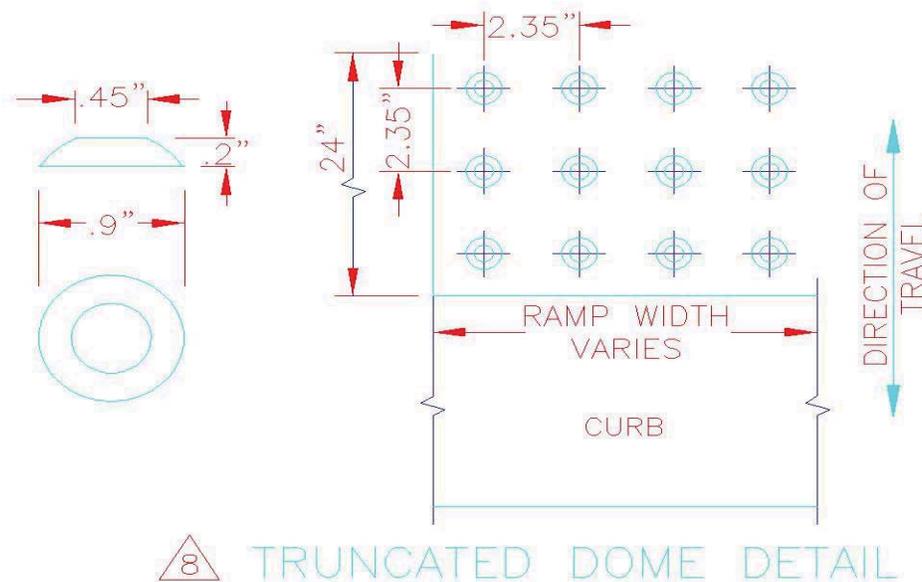
Step 3) Mold is removed from the concrete and a clear sealer is sprayed or brushed onto partially cured surface, for a finished detectable warning that is FHWA and ADA certified.

Exhibit A



## Exhibit B

# Patent Pending ADA Detectable Warning Truncated Dome Tool Design



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