

Accessible Design for the Blind:

A Special Tenth Anniversary Status Report from the Department of Justice

by Access Board

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For more relevant information, please visit the Armor Tile website. This website is an excellent resource on ADA solutions, ADA regulations and requirements, truncated domes, detectable warning surface tiles and more.

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Detectable Warning Surfaces

What is a detectable warning

A detectable warning is “A standardized surface feature built in or applied to walking surfaces or other elements to warn of hazards on a circulation path.” (F106.5, Draft Final ADA and ABA Accessibility Guidelines, April 2, 2002) It is a unique and standardized feature, intended to function much like a stop sign and to alert pedestrians who are visually impaired to the presence of a hazard in the line of travel.



Why is it necessary

As curb ramps have become common in response to the requirements of the Rehabilitation Act (1973) and the Americans with Disabilities Act (1990), an unintended consequence has been that blind pedestrians have found it more difficult to locate the boundary between the street and sidewalk. The only surface which has repeatedly been demonstrated to be detectable to most blind pedestrians, either under foot or by the use of a long cane, is the truncated dome detectable warning surface, which has been required on transit platform edges since 1991 and at curb ramps since July 2001.

Specifications

“Detectable warnings shall consist of a surface of truncated domes aligned in a square grid pattern...”

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

Dome Spacing. 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 (61mm) maximum and a base-to-base spacing of 0.65 inches (16mm) minimum, measured between the most adjacent domes on square grid.

Contrast. Detectable warning surfaces shall contrast visually with adjoining surfaces, either light-on-dark or dark-on-light.” (Draft Guidelines for Accessible Public Rights-of-Way, June 14, 2002)

Research

Two research projects (Barlow and Bentzen, 1992, and Hauger, Safewright, Rigby & McAuley, 1994) confirmed that, for blind travelers, removal of the single most reliable cue to the presence of an intersecting street, that is, the down curb, caused problems. At curb ramps, even skilled travelers failed to detect the street before stepping into it on 39% of approaches. The failure to detect streets was highly correlated with slope of the curb ramp and with the abruptness of change in angle between the approaching sidewalk and the curb ramp. Hauger et al. also found that diagonal/ apex curb ramps were more likely to lead to unsuccessful street crossings.

Despite concerns that detectable warnings would negatively affect the travel of mobility impaired individuals, Bentzen et al. 1993; Bentzen et al. 1994, Hauger et al., 1994, and Hauger et al. 1996 found that truncated dome detectable warnings on slopes or curb ramps had little effect on safety and negotiability for persons having mobility impairments. In fact, Hauger et al. found that persons with mobility impairments generally considered curb ramps having detectable warnings to be safer, more slip resistant, more stable, and to require less effort to negotiate than concrete curb ramps. Both teams of investigators found, however, that a small minority of persons having mobility impairments experienced some difficulty as a result of detectable warnings.

Recommendations

ADAAG originally required the detectable warning surface on the entire width and depth of curb ramps, excluding the flare. To minimize the possibility of problems for persons with mobility impairments and to provide consistent information about the location of the street to individuals who are blind, Bentzen and Barlow (1995) concluded by recommending that 24 in (610 mm) of truncated dome detectable warning be installed along the bottom of curb ramps. That amount had previously been demonstrated to be sufficient to enable detection and stopping on most approaches and was consistent with the depth of detectable warning used at the edges of transit platforms having a drop-off.

It is the current recommendation of American Council of the Blind and of the Association for the Education and Rehabilitation of the Blind and Visually Impaired and is consistent with the ADAAG requirement for truncated dome detectable warning at transit platforms. This is also the recommendation of the Public Rights-of-Way Access Advisory Committee (PROWAAC, Access Board, 2001).

There are now a number of truncated dome products available for installation on curb ramps in various climates and conditions. A report on detectable warnings has been developed by the Access Board and is available by calling 800-872-2253 and asking for Detectable Warnings: Synthesis of U.S. and International Practice. The publication is also available on-line at www.access-board.gov.