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SUPERSEDED BY EB 21-057 EFFECTIVE 11/24/21		*New York State Department of Transportation* **ENGINEERING INSTRUCTION**	**EI 04-038**

Title: **DESIGN GUIDANCE FOR DETECTABLE WARNINGS AT CURB RAMPS AND OTHER PEDESTRIAN CROSSINGS**

Distribution:
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Approved: Philip J. Clark, PE, Deputy Chief Engineer, Design Division — Date: 10/14/04

ADMINISTRATIVE INFORMATION:

- Effective Date: This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of July 7, 2005.
- Superseded Issuances: This issuance supersedes EI 03-024.
- Disposition of Issued Materials: The information provided in this EI will be incorporated into a future revision of the Highway Design Manual, Chapter 18, Facilities for Pedestrians and Bicyclists.

PURPOSE: This EI issues design guidance for detectable warnings.

TECHNICAL INFORMATION:

Detectable Warning Warrants

Americans with Disabilities Act (ADA) regulations require that detectable warnings be installed whenever sidewalk curb ramps at street intersections, curb ramps or cut-throughs in median/refuge islands, and in-street or cross-sidewalk rail crossings are constructed or altered as a part of projects undertaken by the Department.

The U.S. Access Board has also advised that the need to install detectable warnings is triggered by all resurfacing projects (regardless of whether done by capital construction contract, vendor-placed paving contract, or NYSDOT Maintenance forces) or other alterations where curb ramps fall within the project limits. Following the lawsuit Yerusalem v. McKinney, filed in Federal Court against PennDOT in 1992, resurfacing was included in the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) definition of an alteration. Thus, for ADA purposes, resurfacing is not a maintenance activity.

In addition, the FHWA has advised that, whenever a curb ramp is upgraded to include detectable warnings, opposing curb ramps also need to be upgraded. Similarly, if an altered curb ramp is located within an intersection, then all the other curb ramps within that intersection are to be upgraded with detectable warnings.

This does not mean that ramps, which comply otherwise with ADAAG requirements, need to be reconstructed in similar fashion to the altered ramp. Associated curb ramps can be retrofitted with detectable warnings. This can be achieved in several ways.

1. The area to be retrofitted is saw-cut or milled and embedded pavers are installed within the existing surface.
2. The area is saw cut and a concrete pad is poured and stamped with the appropriate pattern.
3. Surface-applied products can be installed.

The Regional Landscape Architect should be consulted to ensure detectable warnings are provided at all locations required by ADAAG.

Detectable Warning Selection and Specification Considerations

It is important to note that detectable warnings are to be constructed at street crossings. This is not necessarily limited to public streets, but also includes stop- or yield-controlled, street-like entrances to commercial or public facilities, including those projects constructed under highway work permits. Detectable warnings should not be installed at relatively minor entrances such as driveways at gasoline stations or similar facilities, unless they are controlled by an official signal or sign. The intent is to provide a warning to pedestrians that they are crossing a significant vehicular passageway. It is the vehicular movements and other street-like conditions which would be determining factors in situations requiring professional judgment.

Detectable warnings come in a wide variety of types, materials, and installation methods. The current specifications provide for three installation methods, i.e., embedded preformed units, stamping, and surface-applied. Contact Main Office Materials Bureau or Landscape Architecture Bureau for the most recent specifications and approved lists. Contact the Regional Materials Engineer or Regional Landscape Architect for further material guidance.

Current installation methods: For each sidewalk curb ramp, designers must select one of the three installation methods covered by the current specifications. The current installation methods are discussed below.

A. Embedded preformed units are pavers, tiles, or panels which are installed within the concrete.

The materials vary from manufacturer to manufacturer. Embedded units may be comprised of clay, cementitious, or polymeric materials.

If embedded preformed detectable warning units are specified, designers should be aware that installation varies by product. If manufacturer's instructions are not available or are deemed inadequate, it may be necessary for the designer to specify the desired installation method. Depending on the situation and/or the manufacturer, the use of adhesives may be required.

Installation options include:

1. Directly embedding the preformed unit in plastic concrete.
2. Installing units within a prepared location (blocked out prior to pouring concrete, milled, saw-cut, etc).
3. Or following guidelines for pavers outlined in the Standard Specifications.

The materials in this category tend to be more durable but more time consuming and costly to install. For materials that are dry-laid on a prepared bed, repair can be done easily. For those embedded within plastic concrete, removal is more difficult. Color options vary by manufacturer and material.

Note: Whenever curb ramps are constructed or retrofitted on structures, the designer needs to ensure that proper reinforcing cover is maintained.

B. Stamping is done at the time the curb ramp concrete is poured. The ramp needs to be constructed using the Department's Class D concrete. As such, stamped concrete is not recommended for bridge decks.

The color can be incorporated into the concrete surface immediately prior to stamping the detectable warnings, integrally incorporated throughout the concrete mix, or applied to the finished surface after the concrete has set. Results from this method have not been consistent and can vary with the experience of the contractor.

C. Surface-applied systems are applied on surfaces after the concrete has set.

The materials vary from manufacturer to manufacturer. They come in the form of sheet goods, self-stick tiles, and polymer panels that are mechanically fastened to the surface. They also come in the form of surface-applied

cementitious or polymeric overlay materials which are stamped to form the detectable warnings.

When the color is not incorporated in the surface-applied product, coloring shall be done consistent with the manufacturer's instructions. Color options vary by manufacturer and material.

Surface-applied installations are generally less time consuming and less expensive than other methods. The ease of repair for surface-applied systems varies by manufacturer and ranges from very easy (e.g., self-stick tiles) to difficult (e.g., polymeric overlays). However, the products or materials in this category tend to be less durable than embedded units or stamped Class D concrete.

Some of the surface-applied products are similar to those used in preformed tape pavement marking operations. Therefore, they could reasonably be installed during the pavement marking phase of the job or within a reasonable period of time thereafter.

These materials are also ideal for temporary curb ramps, and other applicable locations on construction sites.

Color: The detectable warnings are required to contrast (light-on-dark or dark-on-light) with the adjacent curb ramp or other applicable walkway surface. It is recommended that Dark Gray be considered as the default color as it provides good contrast with portland cement concrete sidewalks. Currently designers must specify in the Contract Documents the color to be used. However, future revisions of the special specifications will designate Dark Gray as the default color unless otherwise specified in the Contract Documents. White or Safety Yellow is recommended for use on asphalt concrete or other similarly dark surfaces.

The following colors satisfy the visual contrast requirements defined in ADAAG Section A4.29.2 when placed adjacent to the Department's standard Portland Cement Concrete sidewalks.

- Dark Gray, Munsell Book Notation 10BG 3/1, Federal Standard Number 36081.
- Dark Brown, Munsell Book Notation 10YR 3/2, Federal Standard Number 30097.
- Dark Red, Munsell Book Notation 10R 3/6, Federal Standard Number 10076.
- Dark Green, Munsell Book Notation 2.5G 3/6, Federal Standard Number 14110.

Note: Other suitably dark colors, such as black, are acceptable. However, if a color other than those mentioned above is desired, the designer is responsible for ensuring that the ADAAG visual contrast requirement is met. See the Regional Landscape Architect for further guidance.

Color should be the same on both sides of the street and across intersections.

There are limitations to color choices depending upon the product or the method selected. For example, precast concrete pavers that meet the ADAAG visual contrast requirements are currently available only in dark gray, clay brick pavers are available in gray or dark brown/red, and certain surface-applied materials and methods are only available in red or black. Color can be enhanced by using sealers, color hardeners, or appropriate paints, but these may subject the installation to increased maintenance needs. If more than one color will be used on a project, a table of curb ramps that specifies the color of the detectable warning surface at each curb ramp should be considered.

Snow removal: The method of snow removal to which the detectable warnings will be subjected should be considered by the designer when specifying the methods and materials. Since the Department does not maintain sidewalks (see Highway Design Manual Chapter 18, Section 18.3.1), snow removal may vary from community to community. In many cases, snow removal is done by heavy machinery, i.e., small plows or tractors/skid-steers with snow blowers. Durability may be a major consideration. On the other hand, durability may not be the same concern where snow removal is done by the property owners.

COST: It is anticipated that there will be additional costs, as a result of this EI, due to the increased quantity of curb ramps in a project's scope. In addition, Department maintenance activities may trigger the need to install detectable warnings. Detailed cost data will become available on the Weighted Average Item Price Report as the Department gains experience.

BACKGROUND: A detectable warning is a walkway surface treatment, detectable by blind persons and persons with low vision. Section 4.29 of ADAAG requires detectable warnings on new and altered (i.e., renovated, rehabilitated, or reconstructed) sidewalk curb ramps and at other locations. The requirement to use detectable warnings on sidewalk curb ramps was temporarily suspended by the U.S. Department of Justice (DOJ) in 1994, pending further research. The DOJ allowed the latest suspension to expire on July 26, 2001. The result of DOJ's decision is that the 1991 ADAAG requirement to provide detectable warnings on sidewalk curb ramps and at locations referred to in ADAAG as hazardous vehicular areas was reinstated and became effective immediately. Detectable warnings installed on the Department's facilities must comply with the Department's most current specifications and Standard Sheets for detectable warnings.

REFERENCES:

American with Disabilities Act Accessibility Guidelines (ADAAG)
www.access-board.gov,

Draft Guidelines for Accessible Public Rights-of-Way (June 17, 2002),
http://www.access-board.gov/rowdraft.htm

New York State Department of Transportation Metric Standard Sheets,
M608-5R2
M608-3R3
http://www.dot.state.ny.us/caddinfo/design/stdsheets/stdsht.html

New York State Department of Transportation Metric Pay Item Catalog
Special Specifications:
608.01----91M Surface-Applied Detectable Warning
608.02----91M Embedded Preformed Detectable Warning Units
608.51----24 Stamped Detectable Warnings
http://www.dot.state.ny.us/specs/controlreport.html

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