

To: SUPERSEDED BY <i>EI 03-024, EI 03-025 EFF. 1/15/04</i>		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 02-014
Title: DETECTABLE WARNINGS AT SIDEWALK CURB RAMPS AND OTHER LOCATIONS			
Distribution: ☐ Manufacturers (18) ☐ Surveyors (33) ☒ Main Office (30) ☒ Consultants (34) ☐ Local Govt. (31) ☐ Contractors (39) ☒ Regions/Agencies (32) ☐ _____ ()		Approved:  Philip J. Clark, Deputy Chief Engineer, Design <i>07/09/02</i> Date	

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective immediately. It applies to all projects with sidewalk curb ramps that are under design and to all projects with sidewalk curb ramps that have been constructed since July 26, 2001.
- This issuance does not supersede any previous issuances.
- The information provided in this EI will eventually be incorporated into Chapter 18 of the Highway Design Manual and the Standard Specifications.

PURPOSE:

- To alert designers and construction field staff that the U.S. Department of Justice recently reinstated a previously suspended provision of the *Americans with Disabilities Act Accessibility Guidelines (ADAAG)* that mandates the use of detectable warnings on sidewalk curb ramps at street intersections and at other potentially hazardous locations.
- To issue a special specification that can be used to install detectable warnings that are required on sidewalk curb ramps and at other applicable locations constructed as a part of Department projects.

TECHNICAL INFORMATION:

- **Policy.** Detectable warnings shall be installed whenever sidewalk curb ramps at street intersections, curb ramps or cut throughs in medians/refuge islands, and in-street or cross sidewalk rail crossings are constructed or altered as a part of projects undertaken by the Department.
- **Definition.** A detectable warning is a walkway surface treatment that is detectable by blind persons and persons with low vision. Detectable warnings consist of a standard pattern of small truncated domes located at closely-spaced intervals. The detectable warnings provide a tactile cue that is detectable by cane or underfoot at the boundaries between walkways and vehicular ways.
- **Interim Guidance:** Detectable warnings must comply with the specifications and details set forth in the attached special specification and the revised Metric Standard Sheets for Sidewalk Curb Ramp and Detectable Warning Details (Standard Sheets 6M08-3R2 and M608-5) that are being issued concurrently with this Instruction.
- **Information for Designers.** Detectable warnings must be installed on sidewalk curb ramps

and other applicable surfaces. The curb ramps and other applicable surfaces will continue to be constructed and paid for under the sidewalk or other item(s) in contracts. The detectable warnings will be paid for separately using the attached special specification. The special specification allows contractors to choose from a variety of installation methods which can be demonstrated as durable under climatic conditions similar to those found in New York State and under conditions similar to those found in roadway, sidewalk curb ramp, path, or exterior flooring applications. It is reasonable to expect that contractors may use stamped in place Portland cement concrete, surface applied detectable warning systems that meet the materials requirements included in the special specification, precast unit pavers, or similar techniques. We do not anticipate that fiberglass tiles or similar materials requiring adhesives to bond them to curb ramps and other applicable surfaces will meet the specification's durability requirements.

Designers must specify in the contract documents which of the colors listed in the specification are to be used. 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.

IMPLEMENTATION:

- Because of the immediate need to implement the attached specification, the following implementation schedule is required:
 1. For all projects containing sidewalk curb ramps, and other applicable locations that have been constructed since July 26, 2001, detectable warnings shall be incorporated. Regions may elect to accomplish this within a reasonable period of time (not to exceed one construction season) by use of orders-on-contract, other nearby projects, where and when projects, area wide landscape development projects, etc.
 2. For Contracts submitted for the lettings of or after September 12, 2002 and before January 16, 2003, the revised specification will be added by amendment.
 3. For Contracts submitted for the lettings of January 16, 2003 or later, the revised specifications will be inserted into contract proposals by DQAB.
- The Regional Landscape Architect should be consulted to assure detectable warnings are provided at all locations required by ADAAG.

TRANSMITTED MATERIALS:

- Special Specification 24608.50 Detectable Warning Surface.
- FHWA's Memo of May 6, 2002, INFORMATION: ADAAG Detectable Warnings (Truncated Domes).

BACKGROUND:

Section 4.29 of ADAAG, adopted by the U.S. Department of Justice (DOJ) on July 26, 1991 and by the U.S. Department of Transportation on September 6, 1991, 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 in 1994 pending further research. The suspension was continued in 1998.

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. The detectable warning requirement must be complied with on all applicable projects undertaken by state and local governments. (See attached FHWA memo dated May 6, 2002.) Therefore, detectable warnings must be incorporated into all NYSDOT projects with sidewalk curb ramps that are currently under design and projects that have sidewalk curb ramps that were constructed since July 26, 2001 .

Consistent with *ADAAG* and current best practices identified by the Access Board and its Public Rights-of-Way Access Advisory Committee, the Department will install detectable warnings at curb ramps/cut throughs in medians and refuge islands; and at in-street or cross sidewalk rail crossings.

DISTRIBUTION:

This EI is being issued concurrently with EB 02-032, which issues Standard Sheet M608-3R2, Sidewalk Curb Ramp Details, and EB 02-031, which issues the new Standard Sheet M608-5, Detectable Warning Details.

COST:

There will be unavoidable additional costs associated with the installation of the detectable warnings mandated by the Department of Justice's regulations.

CONTACT: Landscape Architecture Bureau (518) 457-4460

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DESCRIPTION

This work shall consist of furnishing and installing a detectable warning surface on sidewalk curb ramps or other locations as indicated on the plans or elsewhere in the contract documents. The detectable warning surface shall meet the dimensional details and other requirements as noted on the standard sheet and elsewhere in the contract documents.

MATERIALS

All detectable warning systems shall meet the following color and friction and requirements:

- The color of the detectable warning surface shall be dark gray, Munsell Book Notation BG-PB 3/5; dark brown, Munsell Book Notation 10YR 3/2; dark red, Munsell Book Notation 10R 3/6; or dark green, Munsell Book Notation 2.5G 3/6 as specified elsewhere in the Contract Documents. The color of the constructed detectable warning surfaces shall be uniform over the entire surface and shall be an approximate visual match to the color specified elsewhere in the Contract Documents as determined by the Engineer.
- The friction characteristics of completed detectable warning surfaces shall be approximately the same as the adjoining sidewalk or sidewalk curb ramp surfaces as determined by the Engineer.

The Contractor may elect to use any of the following detectable warning systems:

1. **Stamped detectable warning systems.** Stamped detectable warning systems must be capable of uniformly providing the Department's standard detectable warning pattern on sidewalk curb ramps and other surfaces constructed of the Department's standard class of concrete for sidewalks. The color specified elsewhere in the Contract Documents shall be uniformly incorporated throughout the concrete mix, or incorporated into the concrete surface immediately prior to stamping the detectable warnings.
2. **Surface applied detectable warning systems.** For surface applied detectable warning systems, the Manufacturer shall submit certified test results indicating compliance with the following requirements to the Director, Materials Bureau and the Engineer, at least 30 calendar days prior to proposed installation:

STANDARD

ASTM-C-501
MIL-D-3124

PROPERTY

Wear Resistance
Impact Resistance

RESULTS

Wear Index: 25
9 N steel ball dropped twice from
2.4 meters produced no adhesion
failure or cracking

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ASTM E-96	Water Vap. Transm.	100 grams/sq. meter/24 hours
ASTM C-109	Compressive Strength	41 MPa average
ASTM D-C190	Tensile Strength	3 MPa
MIL D-3134	Bonding Strength	2.2 MPa shear, 3.4 MPa pull
ASTM C-293	Flexural Strength	13.0 MPa minimum
ASTM E-162	Fire Resistance	Flame spread index 0 Smoke deposited 1 mg.

Manufacturers of surface applied detectable warning systems shall certify that their materials comply with the volatile organic compound (VOC) requirements of the NYS Department of Environmental Conservation regulation 6NYCRR, Part 205, "Architectural Surface Coatings."

The detectable warning system shall be capable of providing the Department's standard detectable warning surface on sidewalk curb ramps and other surfaces constructed of the Department's standard class of concrete for sidewalks.

The color specified elsewhere in the Contract Documents shall be homogeneous throughout the thickness of the surface material.

- 3. Precast Portland cement concrete detectable warning systems.** Precast Portland cement concrete detectable warning systems shall be manufactured in accordance with the applicable materials specifications in Section 608 of the Standard Specifications.

The precast Portland cement detectable warning system shall be capable of providing the Department's standard detectable warning surface on sidewalk curb ramps and other applicable locations.

The color specified elsewhere in the Contract Documents shall be incorporated into the concrete during the precasting process.

CONSTRUCTION DETAILS

All detectable warning systems shall meet the following requirements:

Prior to the start of work, the Contractor shall show evidence of successful completion of similar installations and provide a job site sample for the approval of the Engineer. The sample size shall be 1.5 meters x .6 meters, minimum, and constructed at a location selected by the Engineer.

As many test panels will be constructed as are necessary to achieve a sample panel that meets the satisfaction of the Engineer. All work shall conform to the appearance of the approved sample to the satisfaction of the Engineer. The sample shall not be incorporated into the work and will be removed when ordered by the Engineer.

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Follow all applicable suppliers and manufacturer's requirements for environmental conditions, surface preparation, installation procedures, curing procedures, and materials compatibility.

The Contractor is responsible for removing any material spatters from areas not included in the scope of the work.

The Contractor shall repair any damage that should arise from the installation or the clean-up effort.

Detectable warning systems selected by the Contractor shall meet the following construction details:

1. **Stamped detectable warning systems.** Stamped detectable warning systems shall be installed during construction of sidewalk curb ramps and other surfaces as specified elsewhere in the Contract Documents.
2. **Surface applied detectable warning systems.** The Contractor shall submit three copies of literature describing the following to the Engineer for distribution to the Materials Bureau and the Regional Landscape Architect and for the Engineer's approval at least 30 days prior to the proposed installation:
 - The Detectable Warning Surface Material
 - All associated materials
 - Preparation requirements
 - Equipment required
 - Name(s) of suppliers
 - Name(s) of subcontractor(s)

In addition, a minimum 300 mm x 300 mm sample of the Detectable Warning Surface Material shall be submitted to the Engineer for the Engineer's approval.

The Manufacturer shall demonstrate in writing and by providing references that the surface applied detectable warning surface material and the proposed system for bonding the detectable warnings to the substrate, if applicable, have been satisfactorily used for roadway, sidewalk curb ramp, path or exterior floor applications in high pedestrian use locations, under weather conditions similar to those experienced in New York State, for a minimum period of five years.

Installers of surface applied detectable warning systems shall be approved by the detectable warning surface material manufacturer. In no case shall the Contractor permit the use of any method, or application of any materials, by untrained personnel or non-approved installers of surface applied detectable warning systems. If a surface applied detectable warning system is used, the surface material manufacturer's certification of compliance with this

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requirement shall be provided to the Engineer.

3. **Precast Portland cement concrete detectable warning systems.** Precast Portland cement concrete detectable warning systems shall be installed in accordance with the applicable construction details specified in Section 608 of the Standard Specifications.

METHOD OF MEASUREMENT

Detectable Warning Surface will be measured as the number of square meters, measured to the nearest tenth square meter, computed from the payment lines as shown on the standard sheet, or as directed by the Engineer.

BASIS OF PAYMENT

The unit price bid shall include all labor, material and equipment necessary to complete the work, including job site sample(s), repairs and clean-up.

Sidewalk curb ramps and other locations where detectable warnings will be furnished and installed will be paid for under the sidewalk or other applicable paving items in the Contract.



U.S. Department
of Transportation

**Federal Highway
Administration**

Memorandum

Subject: **INFORMATION:** ADAAG Detectable Warnings
(Truncated Domes)

Date: May 6, 2002

From: Dwight A. Horne *Dwight A. Horne*
Director, Office of Program Administration

Reply to
Attn. of: HIPA-20

To: Resource Center Managers
Division Administrators
Federal Lands Highway Division Engineers

Recently a number of questions have been raised by people from various agencies concerning the use of detectable warnings, specifically truncated domes, when constructing or altering curb ramps. Truncated domes are the standard design requirement for detectable warnings for determining the boundary between the sidewalk and street by people with visual disabilities.

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 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 at curb ramps and hazardous vehicular ways, but not for transit platform edges. The reason for the suspension was to conduct research on the performance of their detectability. The DOJ 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 DOJ had the option of allowing the suspension to expire on July 26, 2001 or publish a Federal Register Notice 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). After the research was conducted, a new design recommendation was made for the dimension and placement of the domes on curb ramps. Both FHWA and the U.S. Access Board are encouraging the use of the new design over the original. Information on the recommended design and other useful information are included in the attachment.

Attachment

Information on Detectable Warnings (truncated domes)

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.

Where to find information on detectable warnings:

Where to find the regulation on the suspension and requirement:

The US Department of Justice website, www.usdoj.gov/crt/ada/detwarn.htm, or visit the US Access Board's website, www.access-board.gov, click on "publications," go to "facilities," go to "Detectable Warnings: Final Rule"

Where to find the design and application requirement in ADAAG:

Visit the US Access Board's website, www.access-board.gov, click on "publications," go to "facilities," go to "ADA Accessibility Guidelines (ADAAG)" –the provision is in 4.7.7 under Curb Ramps

Where to find technical information and a list of manufactures:

Visit the US Access Board's website, www.access-board.gov, click on "publications," go to "Public Rights-of-Way," go to *Detectable Warnings: Synthesis of US and International Practice*

Where to find the recommended design for curb ramps:

Visit the US Access Board's website, www.access-board.gov, click on "publications," go to "Public Rights-of-Way," go to *Building A True Community: Accessible Public Rights-of-Ways*, sections X02.5.6.2 through X02.5.7.3. After a number of years of research there is a new recommended design for detectable warning/truncated dome. Both the US Access Board and FHWA recommend the new design pattern and application over the original ADAAG design. FHWA's *Designing Sidewalks and Trails for Access, Part II, Best Practices Design Guide* has comparable information to the *Building A True Community* report. At the time the FHWA *Designing Sidewalks and Trails for Access*, went to print, the suspension had not been lifted, so the text in Chapter 6 does not mention that detectable warnings are required.