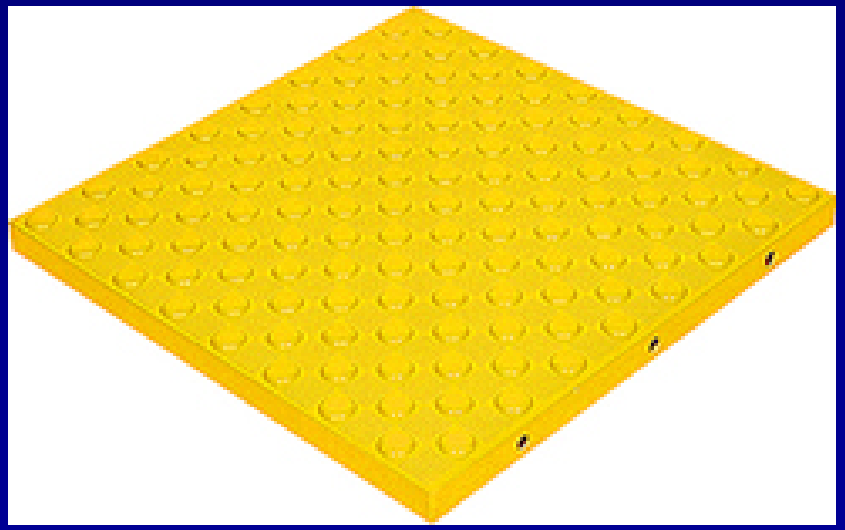
Testing and Evaluation of Detectable Warning Systems – 2005 NESMEA Meeting



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What is a Detectable Warning?

- **A surface feature that aids persons with visual impairments in detecting hazards**
- Requirement of Americans with Disabilities Act Accessibility Guidelines (ADAAG)
- Truncated domes are the only detectable warning design that currently meets ADAAG
- Pedestrians with visual impairments do not reliably detect grooves, striations or exposed aggregate surfaces

ADA and Truncated Domes

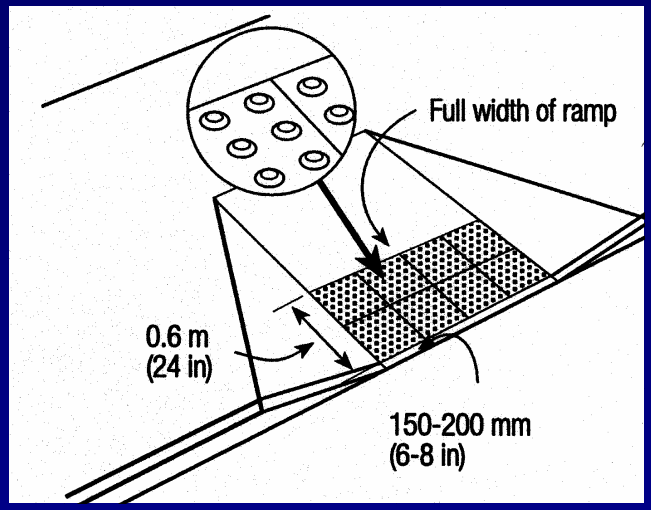
- 1991 - U.S. Access Board publishes ADAAG
- April 1994 - Requirement for detectable warnings on curb ramps suspended
- 1991-2001 - Research conducted on truncated domes
- July 2001 - Suspension expires
- May 2002 - FHWA reinforces required use of truncated domes
- 2003 – VTrans begins evaluating detectable warning products

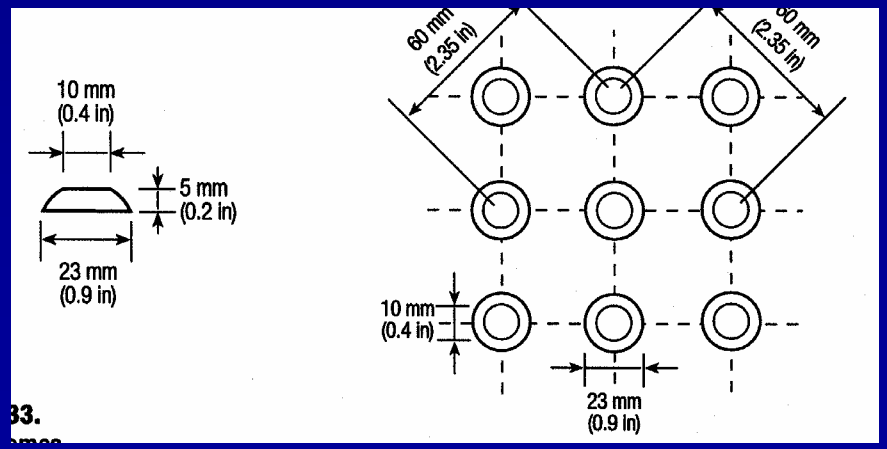
Where Are they Used?

- Train platforms (requirement never suspended)
- Curb ramps where streets are accessed
- Median islands with pedestrian access
- Refuge islands & slip lanes with pedestrian access
- Railroad crossings
- Generally NOT required at driveway crossings

Truncated Dome Dimensions

- 6-8 inches from edge of street
- 2 ft deep, full width of ramp
- Specified diameter, spacing and alignment of domes
- Slip resistant
- Visual contrast with adjoining surface

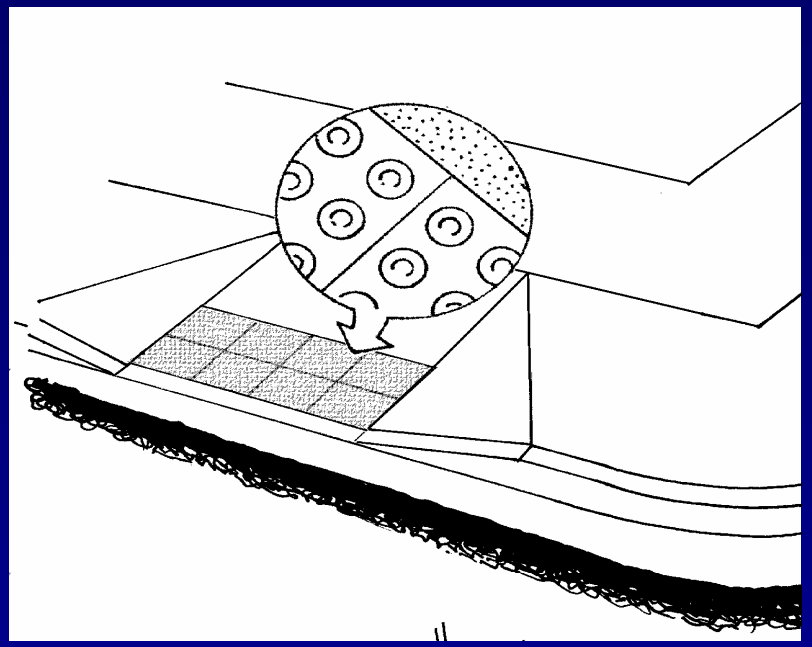




Installation on new curb ramp

Detectable Warnings

A detectable warning at the bottom of curb ramps alerts pedestrians with visual impairments about the sidewalk/street transition.



Many Products are Available

Plastic with adhesive

Thermoplastic

Granite pavers mortared

Composite cast in place

Cast iron cast in place

Product Types

Surface Applied (retrofit or new)

- Resins
- Thermoplastic
- Plastic/recycled tire
- Rigid composite plastic

Cast-in-place (new)

- Rigid Composite plastic
- Cast iron
- Stainless steel
- Pavers (brick, concrete, granite, composite)

Installation of Cast in Place Product

Underside of panel

Screed concrete

Position panel

Set panel with mallet

Weight panels

Finished ramp

Installation of Surface Applied Product

Surface prep

Position molds

Mix Materials

Create domes

Apply top/sealer coat

Finished ramp

Installation of Surface Applied Product

Surface prep

Adhesive under panel

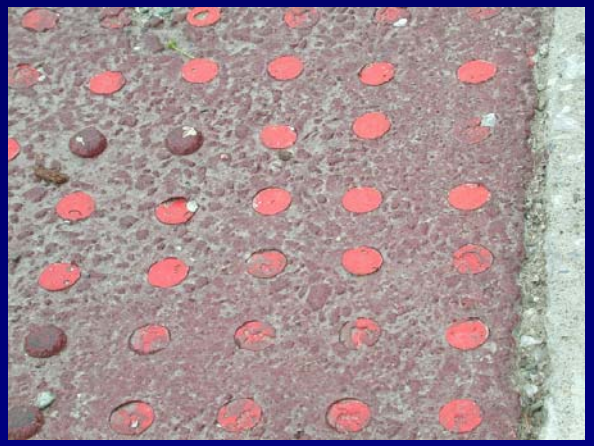
Hammer drill corners

Place anchors

Seal edges

Finished ramp

Types of Material Failure



Dome loss

Delamination

Spalling/domes crushed

Tearing

Dome loss/scraping

Dome loss/scraping

Types of Material Failure

Domes sheered off

Domes chipped

Delamination/dome loss

Dome loss/base loses adhesion

Coating peeled off

Durability Considerations

- Sheer strength of domes - Plows can break domes off
- Resistance to Salt/chemical/sand application
- Adhesion to substrate
- Resistance to UV/sunlight exposure
- Ability to withstand temperature extremes and variability
- Differential expansion and contraction compared to substrate

Testing and Evaluation

- VTrans – Install in “real-world” setting and observe conditions over time (2 reports on Vtrans web site www.aot.state.vt.us)
- NHDOT – Install in lab setting (consistent substrate), submit to “plow rally”
- Wisconsin DOT – Test deck, 50 passes with snow plow
- Other states – Trial and observation
- In general – very subjective and time consuming

Establishing National Standards for Testing and Evaluation

NCHRP Panel D04-33 – Performance Standards for Detectable Warning Materials

- Procedures for testing and evaluating performance and durability
- Guidance on use of procedures for selecting and accepting
- Estimated completion – end of 2008

Current VTrans Construction Spec

- Must meet ADAAG dimensional requirements
- Cannot be stamped concrete
- Must be a contrasting color to surrounding ramp
- Must follow manufacturer installation procedure
- Paid per square yard of material
- Approved product list

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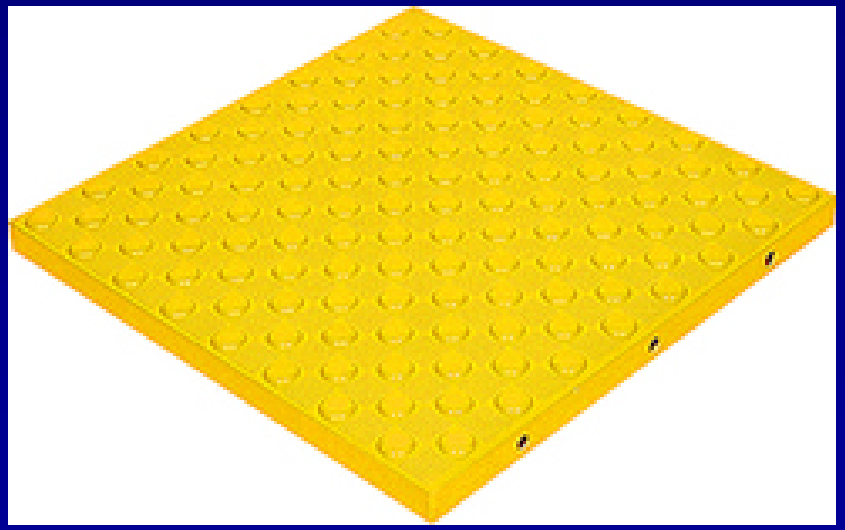

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