Session 23

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Attachments to Traffic Railings

Topic Description

The requirements and background of the new FDOT procedure for attaching miscellaneous items to traffic railings will be presented. Miscellaneous attachments include sign supports, light poles, sound barriers, glare screens, etc.

Speaker Biography

Charles Boyd is a Senior Structures Design Engineer working in the FDOT Structures Design Office, Tallahassee, FL. Charles received a BSCE degree from The Citadel in 1983. He has spent his entire professional career working in the Structures Design Office where he has focused on the design and detailing of bridges and the production of plans, standards and specifications.

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Attachments to Traffic Railings

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Introduction

- Many different attachments are placed on or behind rigid crashworthy traffic railings
- Most attachments have not been evaluated according to any impact safety standards

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Bridge Piers Positioned at Top of Median Barrier

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Luminaire Pole within Rigid Glare Screen

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Large Overhead Sign on Expanded Median Barrier

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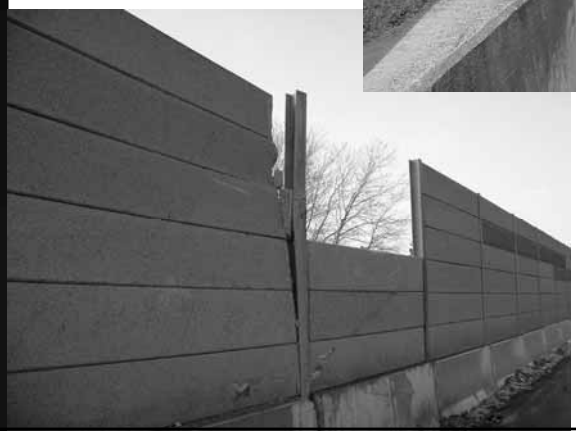
Dual Pole Overhead Sign on Median Barrier

Sound walls and damage from vehicular impacts



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Introduction

- FHWA requires NCHRP 350 compliance
- LRFD references NCHRP 350
- NCHRP 350 offers guidance for safety performance evaluation of individual roadside hardware items
- No guidance for combinations…

Introduction

- Some attachments may provide increased risk to motorists, pedestrians, and/or property nearby
- Guidelines needed for the safe placement of attachments on rigid traffic railings and/or the development of new crashworthy designs

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Introduction

- Midwest Roadside Safety Facility report: "Guidelines for Attachments to Bridge Rails and Median Barriers", 2003
- Zone of Intrusion (ZOI): "intrusion of various vehicle components in an envelope around the barriers"

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Low Speed SUV Crash

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TL-3 Crash Test

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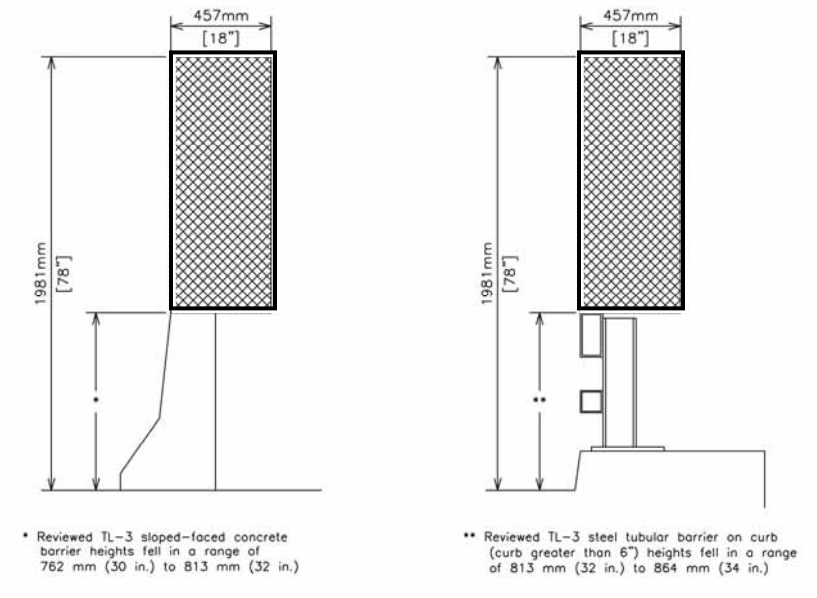
TL-3 Zones of Intrusion



* Reviewed TL-3 sloped-faced concrete barrier heights fell in a range of 762 mm (30 in.) to 813 mm (32 in.)

** Reviewed TL-3 steel tubular barrier on curb (curb greater than 6") heights fell in a range of 813 mm (32 in.) to 864 mm (34 in.)

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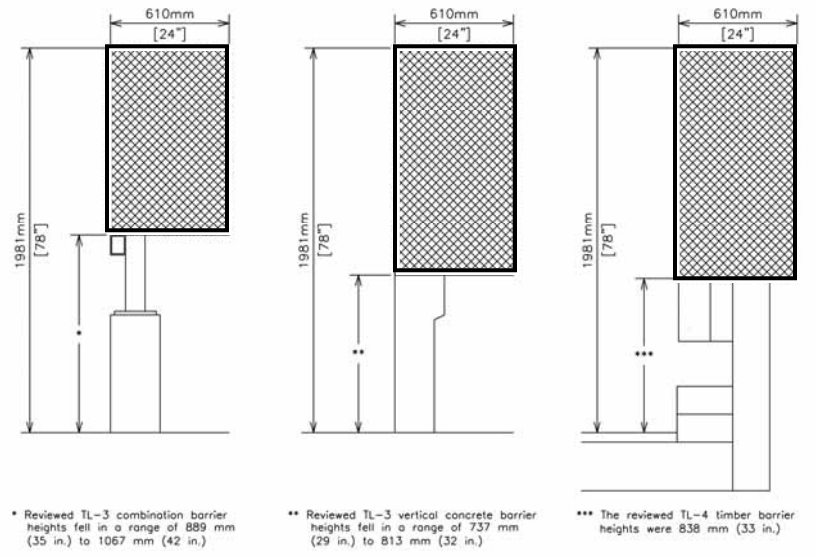
TL-3 Zones of Intrusion



* Reviewed TL-3 combination barrier heights fell in a range of 889 mm (35 in.) to 1067 mm (42 in.)

** Reviewed TL-3 vertical concrete barrier heights fell in a range of 737 mm (29 in.) to 813 mm (32 in.)

*** The reviewed TL-4 timber barrier heights were 838 mm (33 in.)

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TL-4 Crash Test

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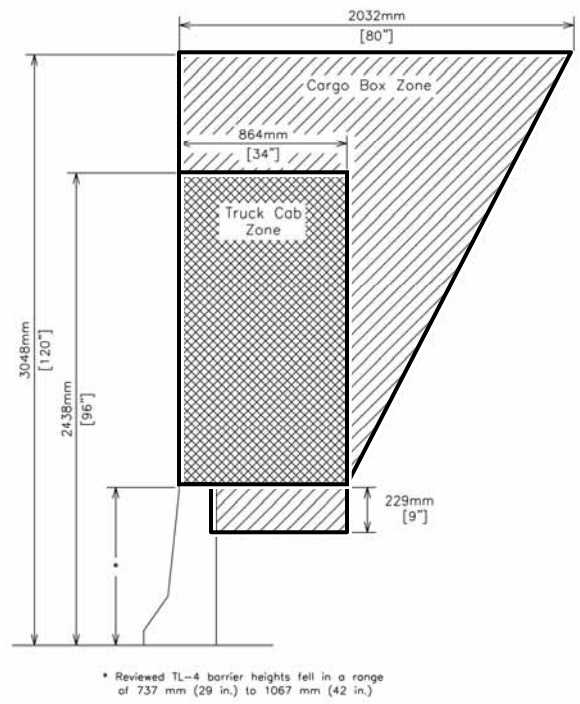
TL-4 Zone of Intrusion



Real World

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MwRSF Preliminary Placement Guidelines

- Attachments not deemed hazardous can remain within the ZOI
- Attachments deemed potentially hazardous must either:
  - be placed outside the ZOI
  - demonstrate satisfactory safety performance through the use of full-scale vehicle crash testing when placed within the ZOI

Research Yet to be Done…

- Probabilistic risk analysis for determining design requirements considering:
  - Continuous vs. non-continuous
  - Physical characteristics of attachment
  - Rigid vs. slip or frangible base
  - Median vs. outside shoulder installation

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- Structures Temporary Design Bulletin C06-05
  Roadway Temporary Design Bulletin 06-04

"Policy for Miscellaneous Attachments to Traffic Railings / Barriers"

- Interim guidance – subject to change

FDOT Temporary Design Bulletin

- Based on MwRSF's research:

  FDOT "setback" ≈ MwRSF "ZOI"

- Setback distances given for non crash tested discontinuous and continuous attachments
- Minimum crash test levels given for attachments placed with setback distances

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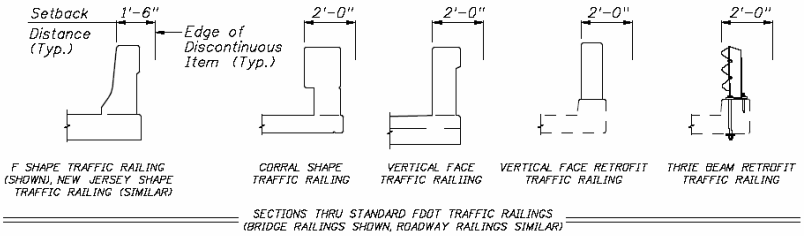
FDOT Temporary Design Bulletin

- Setbacks to discontinuous items: light poles, small sign supports, etc. – similar to TL-3 ZOI



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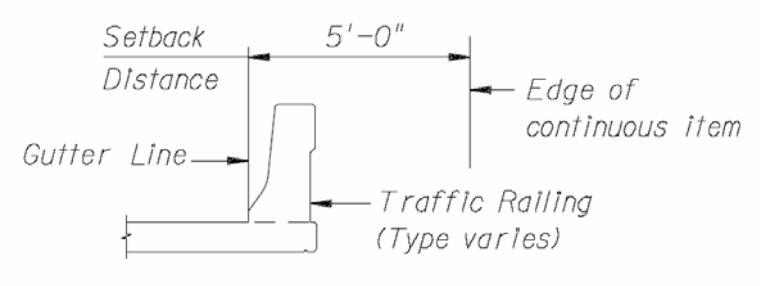
- Setback to continuous items: sound barriers, pedestrian railings, glare screens, etc. – similar to TL-4 ZOI



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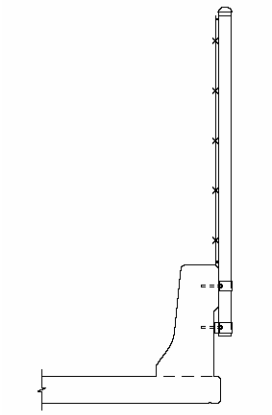
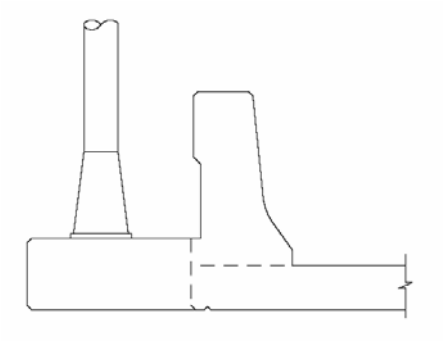
- Crash tested / crashworthy standards:



Bridge / Wall mounted Fence



Bridge / Wall mounted Light Pole

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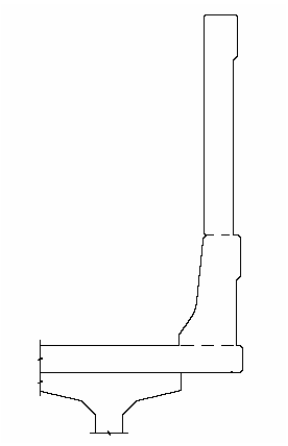
- Crash tested / crashworthy standards:



Bridge / Wall mounted
8’ Sound Barrier
(Ground mounted
14’ Sound
Barrier similar)

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- These requirements are subject to change based on the results of continuing research and adoption of new crash testing criteria
- Possible adoption by AASHTO or other state DOT’s?
- Existing installations, large truck hits…

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- Implementation:

These requirements are effective immediately on all projects that have not yet begun design, and are to be incorporated to the extent practical on all projects currently in design where it can be done so, without impact to production schedules and budgets.

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Acknowledgements

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Texas DOT

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Where to Get More Information

- Comments or questions contact:

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