

QPL 34 APPROVED ROADSIDE SAFETY HARDWARE

SECTION A: ROADSIDE BARRIERS

LIST 34.SECTION A: GUARDRAIL SYSTEMS

PROCEDURES

GENERAL

This evaluation procedure outlines the Department's approval process for guardrail systems.

SPECIFICATIONS

TDOT Standard Operating Procedures

6. Specialty Items

6-1: Procedures and Qualifications for Guardrail Manufacturer and Supplier

December 20, 2011

PROCEDURES

All guardrail systems specified on TDOT projects must be accepted as crashworthy by the FHWA in accordance with either *NCHRP Report 350* or the *AASHTO Manual for Assessing Safety Hardware (MASH)*. A completed Product Evaluation Form, MSDS sheets, if applicable, product data information including acceptance letter from FHWA and a sample of the product being tested must be submitted to the Division of Materials and Tests. A field demonstration may also be required at the Department's discretion.

LIST 34.SECTION A: HIGH TENSION CABLE GUARDRAIL SYSTEMS

PROCEDURES

GENERAL

This evaluation procedure outlines the Department's approval process for high tension guardrail systems.

SPECIFICATIONS

Maintenance Division

SPECIAL NOTES REGARDING LONGITUDINAL CABLE BARRIER

SECTION B: W-BEAM GUARDRAIL END TERMINALS

PROCEDURES

GENERAL

This evaluation procedure outlines the Department's approval process for roadside hardware.

SPECIFICATIONS

AASHTO Roadside Design Guide
TDOT Standard Drawings

PROCEDURES

Only tangential guard rail end terminals should be evaluated and used for the TDOT projects located on NHS.

All guardrail end terminals specified on TDOT projects must be accepted as crashworthy by the FHWA in accordance with either *NCHRP Report 350* or the *AASHTO Manual for Assessing Safety Hardware (MASH)* for Test Level 3 (TL-3). A completed Product Evaluation Form, MSDS sheets, if applicable, product data information including acceptance letter from FHWA and a sample of the product being tested must be submitted to the Division of Materials and Tests. A field demonstration may also be required at the Department's discretion.

Products meeting the above requirements will be presented to the Department's Traffic Control Products Materials Committee (TCPMC) which will make a recommendation as to whether the product will be added to the Qualified Products List.

Items Numbers

(S-GRT-2) TYPE 38 GUARDRAIL END TERMINAL		
705-04.07	TAN ENERGY ABSORBING TERM (NCHRP 350, TL3)	EACH
(S-GRT-3) TYPE 21 GUARDRAIL TERMINAL		
705-04.04	GUARDRAIL TERMINAL (TYPE 21)	EACH

LIST 34. SECTION B: (S-GRT-2) TYPE 38 GUARDRAIL END TERMINAL
MATERIAL CODE QPL.34.004
ITEM NUMBER 705-04.07

LIST 34. SECTION B: MEDIAN GUARDRAIL END TERMINALS (TL-3)
MATERIAL CODE QPL.34.005

FOR MAINTENANCE USE ONLY

LIST 34. SECTION B: (S-GRT-3) TYPE 21 GUARDRAIL TERMINAL
MATERIAL CODE QPL.34.007
ITEM NUMBER 705-04.04

NOT TO BE USED ON NHS PROJECTS

SECTION C: CRASH CUSHIONS

PROCEDURES

GENERAL

This evaluation procedure outlines the Department's approval process for roadside hardware.

Crash cushion (impact attenuators) are used to shield fixed roadside objects located within the clear zone such as bridge piers, overhead sign supports, ends of retaining walls, concrete median barriers, bridge abutments, and bridge railings.

Crash cushions operate on the basis of energy absorption or energy transfer by either decelerating a vehicle to a controlled stop after a frontal impact, or by redirecting a vehicle away from a fixed object after a side impact.

SPECIFICATIONS

TDOT Standard Drawings
TDOT Roadway Design Guidelines
ASTHO, Roadside Design Guide

PROCEDURES

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information including acceptance letter from FHWA and a sample of the product being tested must be submitted to the Division of Materials and Tests. A field demonstration may also be required at the Department's discretion.

All crash cushions specified on TDOT projects must be accepted as crashworthy by the FHWA in accordance with either *NCHRP Report 350* or the *AASHTO Manual for Assessing Safety Hardware (MASH)* for Test Level 3 (TL-3). This requirement shall apply to all temporary work zone and permanent installations.

Products meeting the above requirements will be presented to the Product Evaluation Committee which will make a recommendation as to whether the product will be added to the Qualified Products List.

LIST 34. SECTION C: NON-GATING (REDIRECTIVE) SYSTEMS

GENERAL

Crash cushions of this type, referred to as compression crash cushions require a rigid support back-up structure or foundation to resist the impact force of the vehicle utilizing the energy-absorbing material. These types of crash cushions are considered non-gating, re-directive systems, in that they are not intended to capture the vehicle upon impact (unless frontal impact occurs); but rather, redirect the vehicle after collision. Various systems are available that offer re-directive capabilities on one or both sides of the system.

The two types of non-gating, re-directive crash cushion systems considered acceptable for use are reusable, and low maintenance (self-restoring).

LIST 34. SECTION C: NON-GATING, REUSEABLE SYSTEMS

A reusable system is to only be used on a roadway with ADT of less than 25,000 and a distance from travel way of greater than 10 feet. Only TL-3 systems must be used for TDOT projects. A reusable system may be used at locations can be impacted a maximum of 1 or 2 times per year. All systems should have a reasonable repair time.

*Concrete Pad Required

#May be installed directly on Concrete or Asphalt pavement (refer to manufacturers' shop drawings)

LIST 34. SECTION C: NON-GATING, LOW MAINTANANCE SYSTEMS

Low maintenance systems should be used at roadway locations, with ADT of more than 25,000 and/or a distance from travel way of less than 10 feet, where a high frequency of impact is expected. They should be installed in high-speed, high-traffic volume ramps or medians. For locations where higher crash rates are observed (two or more crashes per year) a low maintenance-self restoring system should be considereAfter an impact occurs low maintenance system should be restored to its original condition and length as soon as possible. All system components should be inspected for damage. Only TL-3 systems shall be used for TDOT projects.

HAZARDS NARROWER THAN 36" WIDE

*All system components should be inspected for damage as soon as possible since they are not at TL-3 capacith for the second impact. After an impact **self-restoring systems** should be restored to its original condition and length.*

*Concrete Pad Required

#May be installed directly on Concrete or Asphalt pavement (refer to manufacturers' shop drawings)

HAZARDS WIDER THAN 36"

*All system components should be inspected for damage as soon as possible since they are not at TL-3 capacity for the second impact. After an impact **self-restoring systems** should be restored to its original condition and length.*

LIST 34. SECTION C: GATING (NON-REDIRECTIVE) SYSTEMS

GENERAL

For gating systems, a vehicle's kinetic energy is transferred to the cushion by accelerating and moving various components of the cushion during an impact. This expandable mass will

normally consist of containers filled with sand. Sometimes referred to as inertial crash cushions, these types of systems require no rigid backup or support to resist a vehicle's impact force, and may be used for both temporary and permanent installations. Water filled systems must be used for temporary work zone applications only.

ONLY TL-3 SYSTEMS SHALL BE USED ON NATIONAL HIGHWAY SYSTEM

LIST 34. SECTION C: GATING SAND-FILLED ARRAYS

SECTION D: TEMPORARY WORK ZONE TRAFFIC CONTROL

PROCEDURES

GENERAL

This evaluation procedure outlines the Department's approval process for roadside hardware.

SPECIFICATIONS

None

PROCEDURES

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information including acceptance letter from FHWA and a sample of the product being tested must be submitted to the Division of Materials and Tests. A field demonstration may also be required at the Department's discretion.

The FHWA guidance on crash testing of work zone traffic control devices is contained in two memoranda. The first, dated July 25, 1997, titled "INFORMATION: Identifying Acceptable Highway Safety Features," established four categories of work zone devices: Category I devices are those lightweight devices which are to be self-certified by the vendor, Category II devices are other lightweight devices which need individual crash testing but with reduced instrumentation, Category III devices are barriers and other fixed or heavy devices also needing crash testing with normal instrumentation, and Category IV devices are trailer-mounted lighted signs, arrow panels, etc. for which crash testing requirements have not yet been established. The second guidance memorandum was issued on August 28, 1998, and is titled "INFORMATION: Crash Tested Work Zone Traffic Control Devices." This later memorandum lists devices that are acceptable under Categories I, II, and III.

Other than the above categorization, all temporary work zone devices specified on TDOT projects must be accepted as crashworthy by the FHWA in accordance with either *NCHRP Report 350* or the *AASHTO Manual for Assessing Safety Hardware (MASH)* for Test Level 3 (TL-3).

Products meeting the above requirements will be presented to the Department's Traffic Control Products Materials Committee (TCPMC) which will make a recommendation as to whether the product will be added to the Qualified Products List.

LIST 34. SECTION D: NON-GATING, WORK ZONE ATTENUATORS (TL-3)

ALL NON-GATING ATTENUATOR SYSTEMS LISTED UNDER SECTION C MAY BE USED FOR TEMPORARY WORK ZONE APPLICATION. CONCRETE PAD MAY BE ELIMINATED FOR SYSTEMS PROVIDING ALTERNATIVE ATTACHMENT DETAIL.

LIST 34. SECTION D: GATING WATER FILLED CRASHED CUSHIONS

THEY MUST BE INSTALLED AT LOCATIONS WHERE PROPER BUFFER ZONE IS AVAILABLE. OTHERWISE A CRASH CUSHION FROM SECTION C: NON-GATING SYSTEM SHALL BE USED.

SECTION E: WORK ZONE CHANNELIZING DEVICES

PROCEDURES

GENERAL

This evaluation procedure outlines the Department's approval process for roadside hardware.

SPECIFICATIONS

Roadside Design Guideline

PROCEDURES

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information including acceptance letter from FHWA and a sample of the product being tested must be submitted to the Division of Materials and Tests. A field demonstration may also be required at the Department's discretion.

All crash cushions specified on TDOT projects must be accepted as crashworthy by the FHWA in accordance with either *NCHRP Report 350* or the *AASHTO Manual for Assessing Safety*

Hardware (MASH) for Test Level 3 (TL-3). To be crashworthy, longitudinal barriers shall be able to contain, redirect, and shield vehicles from work zone areas.

Products meeting the above requirements will be presented to the Department's Traffic Control Products Materials Committee (TCPMC) which will make a recommendation as to whether the product will be added to the Qualified Products List.

LIST 34. SECTION E: WATER FILLED PLASTIC CHANNELIZING DEVICES

DEVICES UNDER THIS CATEGORY SHALL BE USED IN WORK ZONES AS TRAFFIC CHANNELIZING DEVICES ONLY. **THEY SHOULD BE NOT USED AS WORK ZONE BARRIERS.**

SECTION F: MISCELLANEOUS ROADSIDE HARDWARE

GENERAL

This evaluation procedure outlines the Department's approval process for roadside hardware.

SPECIFICATIONS

Roadside Design Guideline

PROCEDURES

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information including acceptance letter from FHWA and a sample of the product being tested must be submitted to the Division of Materials and Tests. A field demonstration may also be required at the Department's discretion.

All products specified on TDOT projects must be accepted as crashworthy by the FHWA in accordance with either *NCHRP Report 350* or the *AASHTO Manual for Assessing Safety Hardware (MASH)*.

Products meeting the above requirements will be presented to the Department's Traffic Control Products Materials Committee (TCPMC) which will make a recommendation as to whether the product will be added to the Qualified Products List.